

Integrating AI-Based Tools to Support Students' Argumentative Writing Development

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Abstract: This study explores the integration of Artificial Intelligence (AI)-based tools in supporting university students' development of argumentative writing skills in an English as a Foreign Language (EFL) context. Writing an argumentative text requires students to construct clear thesis statements, justify arguments with credible evidence, and ensure logical coherence throughout the text. A qualitative descriptive design was employed involving undergraduate EFL students who utilized AI-supported applications, such as AI writing assistants and automated feedback tools, during a series of writing activities. Data were gathered through students' written products, classroom observations, and semi-structured interviews. The results show that the use of AI-based tools enhances students' accuracy, idea organization, and lexical choices, particularly in improving their argument clarity and cohesion. However, the findings also reveal students' dependency on AI suggestions, indicating the need for critical awareness in using AI responsibly. The study concludes that AI-based tools can serve as effective learning support when used under guided instruction, promoting students' argumentative writing competence and autonomy.

Key Words: AI Tools; Argumentative Writing; EFL University Students; Writing Development; Digital

Introduction

The rapid advancement of digital technology has reshaped higher education, particularly in the development of academic literacy and writing competence. Argumentative writing plays a crucial role at the university level, as students are expected to construct logical arguments, evaluate evidence critically, and communicate ideas with clarity and academic rigor (Huynh et al., 2024). However, many university students still encounter difficulties in generating well-structured claims, maintaining coherence, and using appropriate academic language in their argumentative essays. These challenges often lead to writing outcomes that do not fully reflect students' analytical and critical thinking abilities. To address these issues, Artificial Intelligence (AI) based writing support tools have emerged as innovative solutions in language learning. Tools such as Grammarly, QuillBot, and ChatGPT provide automated feedback on grammar, vocabulary choice, content structure, and coherence. By offering instant and personalized suggestions, AI tools can foster learner autonomy, help students revise their drafts more effectively, and support their writing development outside the classroom context. Despite the growing adoption of AI-assisted writing tools in universities worldwide, their pedagogical implications remain debated. Some scholars argue that excessive reliance on AI may hinder students' creativity, reduce deep cognitive engagement, and raise concerns about academic integrity. Moreover, research examining the effectiveness of AI-based support in improving argumentative writing performance among university students particularly in the Indonesian context remains limited (Barasa, 2024).

Considering the increasing demand for digital literacy and the necessity of improving academic writing skills at the tertiary level, this study investigates how AI-based tools can be integrated to support university students' argumentative writing development. The results of this research are expected to contribute to innovative approaches in English language

instruction and provide practical guidance for educators in enhancing writing pedagogy in the digital era. Argumentative writing is one of the most demanding writing genres for EFL university students because it requires the ability to construct a clear position, provide logical reasoning, and support claims with credible evidence. In many contexts, students still struggle to organize their ideas coherently, develop strong thesis statements, and justify arguments properly. Limited vocabulary, insufficient knowledge of academic conventions, and challenges in critical thinking also hinder their performance in producing effective argumentative texts.

In the era of digital transformation and Society 5.0, the integration of Artificial Intelligence (AI) in language learning has brought new opportunities to support students' writing development. AI-based tools such as AI writing assistants, automated feedback systems, and digital collaborative platforms provide instant input on grammar accuracy, vocabulary use, and coherence. These tools also help learners reflect on their writing progress and engage in independent learning based on personalized feedback. Despite the growing use of AI-supported applications in the education sector, many students still lack awareness of how to properly utilize AI features for improving their argumentative writing skills. Additionally, teachers need guidance in selecting appropriate AI tools that align with instructional objectives and ethical standards. This situation highlights the importance of investigating the effectiveness and role of AI-based tools in supporting students' argumentative writing development in EFL higher education settings (Shafamarwa et al., 2024). Therefore, this paper aims to explore how AI-based tools can be integrated into writing instruction and how they influence university students' ability to produce argumentative texts. The results are expected to provide insights into the pedagogical implications of AI integration in writing classrooms, especially in enhancing students' academic writing competence and autonomy. Hence, this study explores what challenges do university students face in developing argumentative writing skills; How do AI-based writing tools support university students in developing their argumentative writing skills; and what are students' perceptions toward the use of AI-based writing tools in their argumentative writing process.

Method

This study employs a descriptive research design to explore how AI-based writing tools support university students in developing their argumentative writing skills. The descriptive approach is considered appropriate for this study because it aims to provide a detailed and systematic description of students' writing improvement and their perceptions toward the use of AI tools in academic writing. The research was conducted at STKIP PGRI Bangkalan where English is taught as a compulsory or supporting course for enhancing academic writing competence. The setting takes place during a regular academic semester when students are required to produce argumentative essays as part of their coursework.

The participants of this study were university students enrolled in an English-related course, particularly those who engage in argumentative writing activities. A purposive sampling technique was applied to select students who have used, or are currently using, AI-based tools such as Grammarly, QuillBot, or ChatGPT in their writing process. Data for this study was collected through three main instruments: argumentative writing tasks, a student perception questionnaire, and optional semi-structured interviews. Students were first asked to produce an argumentative essay before using AI tools. Afterward, they will revise their essays using the selected tools, and the revised versions will be collected for analysis to

determine the improvement in content organization, language accuracy, coherence, and overall writing performance.

In addition to collecting writing samples, the researcher distributed a structured questionnaire to gather information on students' perceptions of using AI-based writing tools. Some participants may also be interviewed to obtain deeper insights and clarification regarding their experiences. The data collected was analyzed using qualitative techniques. The questionnaire responses was analyzed to determine trends in students' attitudes and experiences, while interview data was analyzed using thematic analysis to identify recurring patterns and themes related to the benefits, challenges, and overall perspectives regarding AI integration in writing instruction.

Table 1. Questions delivered to the students

No	Interview Questions
1	How long have you been using AI-based writing tools (e.g., Grammarly, ChatGPT, QuillBot, etc.)?
2	For what types of academic tasks do you usually use these tools?
3	How do AI-based writing tools help you when writing an argumentative essay? Support for Writing Development
4	Have you noticed any improvement in your language use such as vocabulary or academic tone due to AI support?
5	How do these tools affect your confidence and motivation in writing argumentative essays?
6	Do you feel that using AI tools makes the writing process easier or more challenging? Why?
7	In your experience, what are the limitations of using AI-based writing tools?
8	What concerns, if any, do you have about depending on AI tools for writing?

Results and Discussion

AI-based writing tools such as ChatGPT, Grammarly, and QuillBot provide a wide range of automated feedback that supports students throughout all stages of the argumentative writing process. First, these tools help learners to generate and structure ideas more effectively. ChatGPT, for example, assists students in brainstorming claims, identifying counterarguments, and organizing the logical flow of an essay. This guidance helps learners build stronger thesis statements and more coherent argument structures. Additionally, AI tools provide instant corrective feedback on grammar, vocabulary, and academic language usage. Grammarly plays a critical role in improving sentence clarity, accuracy, and mechanics, allowing students to revise errors that may disrupt meaning and weaken argument credibility. Meanwhile, QuillBot contributes to lexical variation and paraphrasing skills, enabling students to restate ideas effectively to avoid redundancy and enhance cohesion. By addressing both macro-level components (content development, organization) and micro-level components (grammar, mechanics), AI tools offer comprehensive writing support that might otherwise be difficult to obtain consistently from instructors due to time constraints. Another significant advantage is the enhancement of learner autonomy and motivation. Because feedback is available instantly, students are encouraged to revise repeatedly without feeling discouraged. The ability to receive support outside classroom hours fosters independent learning habits

and increases students' confidence in expressing arguments. As a result, AI technologies not only improve the final quality of argumentative essays but also support students' critical thinking, revision strategies, and writing development over time.

AI-based writing tools provide a wide range of support that can significantly enhance university students' development of argumentative writing skills. One of the most important contributions of AI tools is their ability to offer instant, individualized feedback on students' writing. Instead of waiting for instructors to review their work, students can immediately identify weaknesses in grammar, coherence, vocabulary usage, and argument structure. This helps them revise their writing more efficiently and encourages active engagement in the revision process, which is a critical stage in developing strong arguments. Additionally, AI writing tools often highlight issues in logic and organization, guiding students to structure claims, supporting evidence, and counterarguments more clearly. Through interactive suggestions and model examples, students can learn how to construct persuasive reasoning and improve the clarity of their stance on a topic (Arochman et al., 2024). Furthermore, AI tools support students in generating ideas and overcoming writing anxiety. When students struggle to formulate arguments or find credible evidence, AI systems can provide topic suggestions, prompts, and explanations that help them expand their ideas. This is particularly useful for novice writers who are still learning to think critically and express complex reasoning in written form. AI technology also enhances students' language proficiency by providing vocabulary enhancements, paraphrasing support, and suggestions to improve academic tone. As a result, students gain greater confidence in writing and develop their skills through repeated practice and exposure to quality writing patterns. Overall, AI-based writing tools function as a scaffolding mechanism, allowing students to gradually improve autonomy and mastery in argumentative writing.

Students generally show positive perceptions toward the use of AI-based writing tools because these technologies make writing tasks easier, faster, and more manageable. Many students appreciate that AI tools provide user-friendly and accessible support, helping them refine their writing without embarrassment or fear of judgment, as sometimes happens with peer or teacher feedback. They feel that AI tools help them write more accurately and professionally, especially in formal academic contexts where strong argumentative structure and proper language use are expected (Lee, 2025). Students also value the ability to learn independently, as AI tools empower them to review their mistakes and understand writing conventions through guided corrections and explanations. However, students' perceptions are not universally positive. Some express concerns about becoming overly dependent on AI tools, which could reduce their ability to develop original ideas and weaken long-term writing skills if not used responsibly. Others question the accuracy and reliability of the feedback, noting that AI-generated suggestions sometimes do not fit well with the intended meaning or the academic context. Despite these concerns, most students still view AI writing tools as beneficial supplementary resources, especially when instructors cannot provide constant support. Overall, students perceive AI-based writing tools as effective aids that enhance their learning experience, boost motivation, and increase their confidence in writing argumentative essays provided that the tools are used wisely and not as a replacement for critical thinking (Höft et al., 2024).

University students generally express positive perceptions toward the integration of AI-based writing tools because these technologies make writing tasks more manageable and less stressful. Many students feel that AI tools serve as reliable learning companions by providing guidance exactly when needed not only on surface-level errors but also on content clarity and organization. This leads to improved writing performance, increased confidence,

and a sense of ownership over their essays. Students also appreciate how AI tools save time, especially during revision stages, allowing them to focus more on argument development rather than struggling with technical issues (Seyoum et al., 2022). They feel more motivated to write because they receive continuous, personalized assistance without waiting for instructor feedback. Furthermore, learners acknowledge that AI tools help them understand their weaknesses such as grammar patterns or logical inconsistencies and therefore support long-term skill improvement. However, students also recognize several concerns and limitations. Some worry that relying too heavily on AI could reduce creativity and critical thinking, making them dependent on automated suggestions. There are also concerns about academic integrity, especially if AI suggestions are copied directly without evaluation. A few students mention that AI feedback is not always accurate, particularly when dealing with complex academic arguments. Overall, students believe that AI-based writing tools are highly beneficial when used responsibly as a support system rather than a replacement for their own reasoning (Amirjalili et al., 2024). They view AI as an innovative resource that enhances their ability to produce coherent, well-structured argumentative essays while still requiring human judgment and ethical writing practices.

Conclusion

This study highlights the significant role that AI-based writing tools play in supporting university students' development in argumentative writing. The findings reveal that these tools offer substantial assistance by providing immediate feedback, improving linguistic accuracy, enhancing organizational structure, and supporting idea development. By functioning as a supplementary learning resource, AI tools help students strengthen critical components of argumentative writing, including the formulation of thesis statements, construction of logical arguments, and improvement of coherence and clarity. Students become more confident and independent in editing and revising their work, resulting in gradual improvement in both their writing performance and academic literacy. In addition, students' perceptions toward AI-based writing tools are generally positive. They view AI technologies as practical, accessible, and motivating resources that reduce writing anxiety and make the writing process more manageable. Students appreciate the personalized guidance that AI tools provide, especially when teachers are unable to give continuous one-on-one feedback. However, concerns remain regarding over-reliance on AI support, the accuracy of automated suggestions, and the potential weakening of students' original thinking if the tools are misused. These concerns indicate the importance of using AI as a complement, rather than a replacement, for human instruction and critical reasoning. Overall, AI-based writing tools have demonstrated clear benefits in enhancing students' argumentative writing skills and supporting their academic development. Future instructional practices should aim to integrate AI technology more strategically into writing courses, ensuring that students not only improve technical proficiency but also continue to develop independent thinking and creativity. With proper guidance, AI can serve as an effective pedagogical partner that empowers students to become more proficient and confident academic writers.

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