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Published online: 20 Jul 2023.

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RESEARCH ARTICLE

# The impact of AI writing tools on the content and organization of students' writing: EFL teachers' perspective

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**Abstract:** The primary objective of this study was to examine the range of available Artificial Intelligence (AI) writing tools and assess their influence on student writing, particularly in terms of content and organization, as perceived by English as a Foreign Language (EFL) teachers. Utilizing a qualitative approach, the research was constructed within a case study design. The data was collected via semi-structured interviews, targeting information about the diversity of AI writing tools and their impact on students" writing quality. The study gathered data from four EFL teachers across three distinct universities in Indonesia, shedding light on the variety of AI writing tools used in their classrooms. These included applications like Quillbot, WordTune, Jenni, Chat-GPT, Paperpal, Copy.ai, and Essay Writer. Furthermore, these teachers unanimously agreed that the AI writing tools positively improved their students' writing quality, particularly enhancing the quality of their content and organization. The findings of this study imply that integrating AI writing tools can prove beneficial in elevating the quality of EFL student writing. In response to this study's limitations, recommendations for future research were also addressed.

## ABOUT THE AUTHORS

Marzuki

Marzuki, a Ph.D. candidate in English Language Education at Universitas Negeri Malang, Indonesia, specializes in various areas of research. His interests encompass Technology in Language Teaching, Strategies in TEFL, and Language Evaluation-based Technology.
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## PUBLIC INTEREST STATEMENT

A recent study conducted in Indonesian universities revealed the positive influence of Artificial Intelligence (AI) writing tools on English as a Foreign Language (EFL) student writing. Interviews with four EFL teachers across three universities highlighted the diverse range of AI writing tools, including Quillbot, WordTune, Jenni, Chat-GPT, Paperpal, Copy.ai, and Essay Writer. Teachers unanimously agreed that these tools improved students' writing quality, particularly in terms of content and organization. The study's implications suggest that integrating AI writing tools can elevate the quality of EFL student writing, enhancing language learning outcomes. These findings have broader implications for educators, students, and policymakers interested in optimizing language instruction through technology.

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## 1. Introduction

The use of Artificial Intelligent (AI)-powered writing tools in English as a foreign language (EFL) classroom is increasing rapidly. These tools include grammar checks, writing aids, and programs that can create written works like essays without human help. They are easy to use and effective, saving students and educators time and effort (T. S. Chang et al., 2021; Gayed et al., 2022; Jeanjaroonsri, 2023; Zhao, 2022). Additionally, AI writing tools have been used particularly for EFL learners with low English proficiency. By using these tools, students can receive immediate feedback and assistance, improving their writing skills faster.

In general, AI writing tools are intended to analyze written materials and provide comments on many parts of the writing, such as grammar, vocabulary, syntax, content, and structure (Hosseini et al., 2023; Strobl et al., 2019; Thorp, 2023). Such feedback is created by machine-learning algorithms that compare the written text to a big database of correct and incorrect instances of writing. In other words, EFL students can obtain instant and tailored feedback on their writing, which can assist them in identifying and correcting faults more rapidly. This real-time feedback can also assist students in comprehending the fundamental concepts of successful writing and offer them with direction for enhancing their writing abilities (Akgun & Greenhow, 2022; Nazari et al., 2021; Rudolph et al., 2023).

Recently, there is 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 effect of these tools (e.g., Y. Liu et al., 2022; Lund & Wang, 2023; Qadir, 2022). Nevertheless, the literature presented focuses solely on the role of AI writing tools in improving grammar and syntax. While this is undeniably a crucial aspect, it does not address the full spectrum of what contributes to effective writing. The content and organization of a piece of writing are equally significant components that profoundly affect the reader's understanding and engagement (I. Lee & Yuan, 2021). Content is the core of any piece of writing. It carries the ideas, thoughts, and messages that the writer wants to convey. It is the "what" of the writing—the substance. High-quality content is relevant, informative, original, and meaningful, resonating with the audience and fulfilling its purpose—whether that be to inform, persuade, entertain, or provoke thought (Molina et al., 2021). Organization, on the other hand, is the "how" of the writing—the structure. It involves how the content is arranged, connecting ideas in a logical, coherent manner that guides the reader through the piece. The organization can significantly affect how well the reader understands the content, how persuasively an argument is presented, or how engaging a narrative is. Good organization ensures a smooth flow of ideas, making the writing easier to follow and more impactful (Awada et al., 2020). Therefore, the focus on just grammar and syntax overlooks the critical roles of content and organization in writing. While getting the words right is essential, what those words express and how they are structured are just as vital to effective communication. Thus, it is crucial to explore what the types of AI writing tools and how the tools address these other key aspects of writing from the perspective of EFL educators.

A similar situation holds true in the Indonesian context. To the best of our knowledge, there is almost no research in the Indonesian context that has been reported in journal articles examining the impact of AI writing tools on the content and organization from either students' or teachers' perspective. The present authors are aware of the seminal work of Miranty and Widiati (2021) and Fahmi and Cahyono (2021), which, to some degree of details, examine the use of Automated

Writing Evaluation (AWE) as one of the AI writing tools employed by Indonesian EFL students in their writing. Miranty and Widiati (2021) explored students' perceptions of the merits and drawbacks of AWE (i.e., Grammarly), while Fahmi and Cahyono (2021) aimed to investigate differences in students' perceptions towards the use of AWE based on their proficiency levels. Their research findings suggest that using AWE can provide students with positive benefits, which were consistent across their studies. Despite these insightful findings, more research on the impact of AI writing tools is necessary. It is true the previous studies have provided information regarding the influence of these tools on student writing. However, it is still unclear how AI writing tools affect the quality of student writing particularly on the aspects of content and organization. Consequently, this study has been meticulously designed to fill the prevailing knowledge gap, thereby delivering a more comprehensive understanding of AI writing tools' utility in EFL classrooms. The primary objective of this research is to explore the variety of AI writing tools and evaluate their impact on student writing, particularly focusing on content and organization, through the lens of EFL teachers. To this end, we posed the following critical research questions:

(1) What types of AI writing tools are used by EFL teachers to improve students' writing quality, particularly in terms of content and organization?

(2) How do EFL teachers perceive the impact of AI writing tools on the content and organization aspects of students' writing?

The urgency in answering these research questions stems from two primary reasons. Firstly, understanding the types of AI writing tools used by teachers and their methods of integration could provide a blueprint for other educators looking to implement similar technologies in their teaching practices. This insight can ultimately contribute to the broader and more effective use of AI in EFL instruction. Secondly, investigating teachers' perceptions of AI writing tools is crucial. If teachers view these tools as beneficial, this positive perception can lead to more widespread adoption, enriching EFL instruction across the board. However, if teachers are apprehensive or skeptical about these tools, identifying and addressing their concerns becomes paramount. This understanding would allow for modifications in AI tools or teaching strategies to ensure the potential of AI is fully realized and appreciated in language learning settings. By answering these questions, this study hopes to pave the way for more effective AI integration in EFL classrooms.

## 2. Literature review

### 2.1. Teaching writing in the artificial intelligence era

The evolution of teaching writing in the current age of technological proliferation cannot be dissociated from the rapid advancement of digital tools and. As eloquently discussed in Haleem's et al. (2022) research, this shift is precipitated by an increasing fusion of digital utilities within the educational realm, effectively transforming traditional pen-and-paper methodologies into far more creative and dynamic pedagogical experiences. Garlinska et al. (2023) discuss how virtual classrooms, online workshops, and cloud-based writing tools, for example, are revolutionizing the domain of writing instruction. These platforms offer functionalities such as real-time feedback, collaborative editing, and plagiarism checks. Such features not only enhance the writing acumen of students, as per Nykyporets's (2023) study, but also inspire them to engage in critical thinking and independent reasoning.

Furthermore, as illustrated by Bhutoria's (2022) work, AI-driven platforms and applications offer personalized learning opportunities for students, identifying their writing strengths and weaknesses. This empowers educators to tailor their teaching strategies to each student's unique needs and preferences, leading to more effective learning outcomes (Dogan et al., 2023). In the same vein, Cahyono et al. (2023) explored of the workable approach mediated by mobile technology in teaching writing uncovers another layer of tech-enabled pedagogical innovation. Students are emboldened to publish their work in public forums, nurturing their confidence and writing

abilities. Such platforms also promote peer review and feedback mechanisms, fostering a sense of community and collaborative learning (Umamah & Cahyono, 2022). However, as the literature acknowledges, the digitization of writing instruction is not without its challenges. As Duncan and Joyner (2022) articulated, educators must grapple with issues related to digital equity, privacy, and the potential for distraction. These issues underscore the necessity for an ongoing dialogue and proactive approaches in crafting pedagogical policies and strategies as we continue to navigate the teaching of writing in this artificial intelligence era.

### 2.2. The impact of AI writing tools on students writing quality

There has been burgeoning research on the impact of AI writing tools on students' writing ability. While several studies indicate positive outcomes, others highlight potential negative impacts. On the positive side, AI writing tools such as Grammarly, QuillBot, Wordtune, and Jenni have been found to significantly improve students' writing skills. These tools utilize advanced algorithms to identify common errors in grammar, punctuation, and syntax and provide suggestions to improve clarity and style. They also offer unique capabilities such as paraphrasing and refining sentences for enhanced effectiveness. A study by Tambunan et al. (2022) showed that using Grammarly improved students' grammar and punctuation. Grammarly's AI analyzes the user's text, provides real-time suggestions for enhancing grammar, spelling, punctuation, clarity, engagement, and delivery. This has the effect of turning the process of writing into a learning opportunity. QuillBot, another AI tool, specializes in paraphrasing, helping students avoid plagiarism while maintaining the original meaning of their content. Kurniati and Fithriani (2021) found that QuillBot aided students in developing better paraphrasing skills, which is a critical competency in academic writing. WordTune, on the other hand, focuses on refining and improving the tone and style of the text. A study by Lam and Moorhouse (2022) found that WordTune effectively helped students identify their writing weaknesses, thereby promoting self-assessment and learning. This tool goes beyond simple grammar correction and delves into the stylistic elements of writing. Jenni is another AI-based writing assistant that provides predictive text suggestions to help users compose emails, reports, articles, and other documents more efficiently. Although no specific research was cited in this regard, user feedback suggests a positive impact on writing productivity and creativity. GPT-3, developed by OpenAI, represents a significant advancement in language model technology. Capable of generating coherent and contextually relevant sentences, GPT-3 has been found to stimulate students' creative and critical thinking (Mhlanga, 2023). It can be an excellent tool for students to experiment with different writing styles and ideas. These studies highlight the potential of AI tools in enhancing the writing abilities of students.

In terms of the content and the structure of writing, a number of research has shown that AI writing tools can significantly enhance the efficiency and quality of writing tasks. AI-based tools, like GPT-3 and its successor GPT-4, have been leveraged to suggest the next word or paragraph in a text, aiding authors in creating human-like compositions (Y. Liu et al., 2023). This process is facilitated by machine learning algorithms that predict text sequences based on the vast amount of data they have been trained on. Furthermore, there is ongoing research exploring the impact of these tools on different aspects of writing. For instance, a study found that AI writing tools like "AI KAKU", a popular Japanese-developed English language learning tool, could potentially reduce cognitive barriers for English as a Foreign Language (EFL) learners when producing written text in English (Gayed et al., 2022). This is achieved by providing real-time translation and grammar suggestions, making the writing process less daunting. Another important application of AI in writing is its ability to expedite the literature review process, which deals with large volumes of partially structured (meta)data (Wagner et al., 2022). This is particularly valuable in fields like healthcare and social sciences, where researchers must often sift through enormous bodies of literature for their studies. In conclusion, the evolution and application of AI writing tools like have undoubtedly marked a significant stride in the world of writing and literature. These advancements hold substantial potential in not only streamlining the writing process but also in improving the quality and efficiency of written output.

Despite these advantages, certain studies have indicated potential drawbacks. For instance, AI writing tools may inadvertently promote over-reliance among students, as they might lean too heavily on these tools for correction without thoroughly understanding their mistakes. This dependency can stunt their natural learning process and development of self-editing skills. Iskender (2023) provided a critical perspective on this matter, arguing that the use of AI writing tools could lead to diminished critical thinking skills if students become overly dependent on them. They expressed concern that students might prioritize quick fixes from AI tools over deeply understanding and learning from their mistakes, which would essentially negate the process of learning, growth, and development in writing. In addition to concerns about over-reliance, the impact of AI writing tools on creativity has also been questioned. Some educators worry that students might use these tools not just for refining their language, but also for generating ideas, potentially curtailing their creative thinking and originality (Johinke et al., 2023). Furthermore, Farrokhnia et al. (2023) pointed out that while AI tools can improve certain writing skills, they may not be as effective in addressing higher-order writing elements, such as argument structure and coherence. These aspects require a deep understanding of the topic, logical thinking, and the ability to connect ideas, which are currently beyond the capacity of AI tools. In terms of tone and context, AI tools may also falter. These tools might not fully grasp the subtleties and nuances of human language and emotion, potentially leading to suggestions that may not be appropriate or accurate in a given context (Haleem et al., 2022). Finally, issues of digital equity have been raised. Not all students have equal access to these technologies, leading to potential disparities in learning outcomes. In their study, Mozumder et al. (2023) noted that students without access to high-speed internet or modern digital devices might be unable to utilize these AI tools, widening the educational achievement gap. Therefore, while the application of AI in writing instruction has promising benefits, educators need to be mindful of these potential drawbacks and address them proactively in their teaching strategies.

## 3. Method

### 3.1. Research design
To address the research questions, a qualitative approach was employed, specifically utilizing a case study methodology. The case study methodology, which typically involves conducting interviews and/or observations, enables the researcher to uncover important factors that emerge from the open-ended process (Yin, 2009). Through this methodology, we were able to explore in-depth the types of AI writing tools used by EFL teachers, as well as their perceptions about the impact of these tools on students' writing quality, particularly in terms of content and organization.

### 3.2. Research participants
This study focused on gaining insights from EFL teachers experienced with AI writing tools, specifically their views on how these tools affect student's writing quality, particularly in terms of content and organization. Four writing teachers were recruited from three different universities, one being a public institution and the other two, private. The selection was primarily based on their practical experience with AI writing tools in the classroom, accessibility, willingness to participate, and teaching expertise in advanced courses such as essay writing and argumentative essay writing. These advanced courses often demand a higher level of grammatical knowledge and a deeper understanding of discourse structure.

All the recruited teachers possessed at least three years of experience in teaching EFL and a minimum of one year's experience in applying AI writing tools in their classrooms. These AI tools served as supplementary teaching resources, aiding in grammar checking, paraphrasing, plagiarism detection, generating content, and offering suggestions to enhance the clarity and coherence of students' writing. This ensured the teachers' experiences transcended mere theoretical knowledge, encapsulating practical applications of AI tools in real-life teaching scenarios.

| Table 1. Demographic information of participants | | | | | |
|---|---|---|---|---|---|
| Respondent | Age (years) | Gender | Teaching Experience (years) | Qualification | Experience in Using AIWT* (years) |
| T1 | 37 | Male | 8 | Master | ≥1 |
| T2 | 42 | Female | 15 | Ph.D. | 2 |
| T3 | 39 | Male | 10 | Master | 2 |
| T4 | 37 | Male | 8 | Master | ≥1 |

Note: *AI writing tools.

Teachers' classes varied in size, ranging from intimate, personalized instruction settings to larger, conventional classrooms. This range in teaching environments was intentional, allowing the study to account for various factors potentially impacting the efficacy of AI tools. These factors could include class size, available institutional resources, the composition of the student population, and individual teaching styles. Such a diverse selection of participants enabled a comprehensive understanding of EFL teachers' experiences and perspectives while using AI writing tools.

Participants were designated as T1, T2, T3, and T4 to maintain confidentiality. The recruitment process began with contacting prospective participants via email, outlining the study's purpose, their roles, data collection methods, and their rights, including the ability to withdraw from the study at any point without any repercussions. This ensured adherence to ethical research guidelines. They were also provided with an informed consent form to read, comprehend, and sign if they agreed to participate. Through this careful recruitment process, the study maintained the highest ethical standards while ensuring the inclusion of relevant experiences and perspectives. The demographic information of the participants is presented in Table 1.

### 3.3. Instrument
We used interviews as our research instrument to collect the required data for this study. This instrument allowed us to gather rich, qualitative data related to EFL teachers' use of AI writing tools, and their perspectives on the impact of these tools on students' writing quality- specifically, in terms of content and organization. To construct pertinent interview questions, we turned to several relevant pieces of literature. Works by Nazari et al. (2021), Dale and Viethen (2021), M. Lee et al. (2022), and Zhao (2022) served as valuable references. By undertaking an in-depth review of these sources, we focused on the topics and themes that aligned with our research objectives.

This thorough literature review helped us craft our interview protocol. It included specific questions such as "What AI writing tools have you used in your classroom?" and "In what ways have these tools impacted your students' writing, specifically with respect to content and organization?" This interview guide allowed us to investigate both the practical applications and theoretical implications of AI writing tools in the EFL teaching context.

### 3.4. Data collection procedure
After designing the interview protocol centered on the types of AI writing tools utilized by EFL teachers and their views on the impact of these tools on student writing quality (specifically, content and organization), we organized interviews with each participant. These were scheduled according to their convenience and availability. Before starting each interview, we briefed the participants about the study's objectives, the interview process, and our rigorous approach to data protection. We secured their informed consent to proceed, ensuring they comprehended their rights, including the freedom to withdraw from the study at any time. During the interview, we began with general questions about their experiences teaching EFL and using AI writing tools, thus

fostering a relaxed environment conducive for open discussions. Gradually, we introduced more specific questions aligned with our interview protocol, delving into the particular AI writing tools they had employed and their impact on students' writing quality, particularly in terms of content and organization improvements.

To address potential social-desirability bias inherent in self-reported data, we emphasized to the participants that there were no right or wrong answers and encouraged them to be as open and honest as possible. This was done to ensure the reliability and authenticity of the responses gathered. Each interview was recorded with the participant's permission, to maintain accuracy in capturing their responses, an integral part of reliable transcription and subsequent data analysis. Note-taking during the interviews was also employed as a means to highlight significant points, capture nuanced details, and document immediate observations.

Upon the conclusion of each interview, we expressed our gratitude to the participants for their contributions, also providing them with an opportunity to pose any questions about the study or to add any further comments. Following the interviews, we carefully transcribed the recorded dialogues, transforming verbal insights into textual data. Accuracy during this stage is critical, as the transcribed data underpin our subsequent analysis. All collected data, encompassing the interview recordings, transcriptions, and notes, were securely stored, respecting participant privacy and enabling efficient data management for ensuing stages of data analysis and research reporting. Adhering to these practices ensured a comprehensive, ethical, and effective data collection procedure for our research on AI writing tools' use and impact in EFL teaching.

### 3.5. Data analysis

We employed a thematic case study to analyze the qualitative data. As outlined by Braun and Clarke (2006), the goal of this thematic analysis was to identify patterns and connections among themes extracted from the qualitative data, thereby addressing our research questions. We divided the analysis into five distinct steps.

In the first step, we thoroughly read the interview transcript multiple times to familiarize ourselves with its content. The second step involved developing preliminary codes that grouped related words and phrases in line with our research criteria. Following a detailed analysis of these codes, we then categorized each one. In this step, we also compared the results to identify any relationships or patterns. Finally, we established a set of categories from these grouped codes.

### 4. Findings

### 4.1. Types of AI writing tools use by the EFL teachers

Drawing from the data collated during the interview phase of our research, it was evident that the four EFL teachers under study employed a range of AI writing tools in their teaching practice. These tools were chosen and used based on their distinctive features and capabilities, aligning with the unique demands of their teaching environments and objectives. To provide a detailed yet succinct overview of these AI writing tools, we have organized this data into a clear and informative format. Refer to Table 2, which serves as a comprehensive catalog, capturing the variety of AI writing tools adopted by these EFL teachers. This table effectively highlights the names of the AI tools in use and their specific purposes, providing a comprehensive snapshot of the current landscape of AI utilization in EFL teaching.

The provided dataset in Table 2 reveals a notable pattern of how four teachers (T1, T2, T3 and T4), integrated Artificial Intelligence (AI) tools in their teaching methodologies. These teachers had shared a common interest in utilizing a combination of AI tools in enhancing students' writing skills, hinting at the fundamental trend of embedding technology into education.

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| Table 2. Types of AI writing tools were used by the EFL teachers | | |
|---|---|---|
| **Initial of Teachers** | **Types of AI writing tools Used** | **Purpose of use** |
| T1 | Jenni AI | Assists students in brainstorming and organizing thoughts prior to writing. |
| | Quillbot and WordTune | Used to teach paraphrasing skills and improve sentence flow. |
| | ChatGPT | Simulates conversations with students, thereby enhancing their conversational writing skills. |
| T2 | Quillbot | Facilitates teaching of paraphrasing and the avoidance of plagiarism. |
| | Wordtune | Aids students in improving sentence structure and in expressing their ideas more clearly. |
| | Copy.ai | Generates creative writing samples used as examples of various writing styles. |
| | Paperpal | Performs grammar checks and provides real-time corrections. |
| T3 | Essay Writer | Guides students in structuring their essays logically and suggests areas for improvement. |
| | QuillBot | Used for practice in paraphrasing. |
| | Wordtune | Improves sentence quality and clarity. |
| | ChatGPT and Jenni | Facilitates brainstorming and aids students in organizing their thoughts effectively. |
| T4 | WordTune | Refines sentence structure and enhances coherence. |
| | Jenni | Assists students in brainstorming for topic ideas. |
| | QuillBot | Teaches students to paraphrase their sentences. |
| | Copy.ai and Essay Writer | Helps students craft compelling pieces of writing in various styles and formats. |

Two tools, QuillBot and Wordtune, had emerged as universally used across all four teachers. QuillBot, known for its proficiency in paraphrasing, was an important part of teaching students how to express the same idea in different ways, effectively aiding in the avoidance of plagiarism. Wordtune, on the other hand, was employed to improve sentence structure and clarity, making it an essential tool in teaching English and enhancing students' written expression.

A second layer of commonality could be seen with Jenni AI and ChatGPT, which were employed by three out of the four teachers (T1, T3, and T4). Jenni AI, renowned for its topic modeling capabilities, assisted students in brainstorming and organizing their thoughts prior to writing, thereby encouraging critical thinking and structured writing. Chat-GPT simulated conversations, assisting students in improving their conversational writing skills, which was a crucial aspect of English learning in a globalized and digitally connected world.

While the aforementioned tools were the common threads woven into the teaching methodologies of these teachers, they also diversified their approach with specific tools unique to their classrooms. For instance, T2 used Copy.ai and Paperpal. Copy.ai generated creative writing

samples, serving as examples for different styles of writing and thus, fostering creativity in students. Paperpal was utilized for its strength in grammar checks and providing real-time corrections, which was a vital practice in English learning. T3 employed Essay Writer, which helped students structure their essays logically and provided them with ideas for improvements, a tool that seemed uniquely suited to a classroom focused on academic writing. T4 also brought in Copy. ai and Essay Writer, leveraging these tools to show students how to craft compelling pieces of writing in various styles and formats.

When considering the demographic information of participants given in Table 1 and analyzing it against the teachers' utilization of AI tools, several initial observations become apparent. It appears that the teachers with more years of experience in using AIWT, T2 and T3, utilize a broader set of AI tools. Notably, T2, who is the oldest, holds the highest qualification (a Ph.D.) and has the most teaching experience, utilizes unique tools like Copy.ai and Paperpal. Similarly, T3, who has comparable AIWT experience, also uses a unique tool, Essay Writer. This pattern suggests that more seasoned and experienced teachers in using AIWT may exhibit greater confidence in exploring diverse AI tools for varying educational purposes. While it is challenging to conclude any significant gender-based differences in AI tool usage from this dataset, it is worth mentioning that the only female teacher, T2, uses a unique set of tools that could be more attributable to her experience and qualifications than her gender. Furthermore, it is worth noting that the level of teaching experience and qualifications may influence the use of AI tools. T2, having the highest teaching experience, experiments with unique tools, suggesting that more experienced teachers could be more exploratory. Similarly, the teacher with a Ph.D. degree, T2 again, utilizes unique AI tools, hinting that the level of education might have some influence on the choice of AI tools. However, given the small dataset, these observations need to be treated as preliminary trends rather than definitive conclusions.

### 4.2. Teachers perspective toward the impact of AI writing tools
In this section, we delved into the findings from our interviews regarding the teachers' perspectives on the impact of AI writing tools on students' writing quality, specifically focusing on the aspects of content and organization.

#### 4.2.1. Impact on the aspect of content writing
When examining the aspect of content, we identified two major sub-themes: idea generation and vocabulary and language use.

*4.2.1.1. Idea generation.* The responses from four teachers (T1, T2, T3, & T4) highlighted a wide range of opinions among them regarding the impact of AI writing tools on students' creativity and ability to generate ideas. T1, for example, highlighted the potential benefits of AI writing tools, emphasizing their ability to stimulate creativity and idea expansion. According to him, these tools could offer various angles or perspectives when students were struggling with writer's block, thereby helping them overcome creative obstacles. The teacher's reply is as follows:

> AI writing tools have been instrumental in boosting students' creativity by providing suggestions and expanding on initial ideas. When students get stuck or encounter writer's block, these tools can propose different angles or perspectives, assisting them in overcoming creative hurdles.…. (T1)

Conversely, T2 expressed a more mixed evaluation of AI writing tools. On one hand, she agreed with T1 that these tools could provide a kick-start when students grappled with idea generation. However, she also voiced a concern that the ideas produced by these tools could be rather generic or impersonal. In her view, while AI tools could assist in certain situations, they might not always promote deep or critical thinking about a topic. The teacher respond in the following manner:

> In my experience, AI writing tools have had mixed effects on students' abilities to generate ideas. On one hand, they can provide a starting point when a student struggles with idea generation. However, the ideas generated by the tool can be rather generic or lack personal touch. Therefore, while they can be helpful in some instances, they might not always encourage students to think deeply or critically about a topic. (T2)

In contrast to the previous views, T3 brought a different perspective, suggesting that AI writing tools could potentially hamper students' ability to generate original ideas. He posited that students might become overly reliant on the suggestions provided by the tool, limiting their willingness to think creatively or innovatively. He argued that struggling with idea generation and problem-solving might be beneficial in the long run as these were key skills that could be honed over time. The teacher offered the following response:

> I've observed that AI writing tools can sometimes inhibit students' ability to generate original ideas. This might be because they become reliant on the tool's suggestions, and stop pushing themselves to think outside of the box. In some cases, it might be more beneficial for students to struggle with idea generation and problem-solving, as these are valuable skills that can be cultivated through practice. (T3)

Lastly, T4 re-emphasized some positive aspects of AI writing tools, notably their capacity to aid students in developing their ideas further. He noted that these tools could offer phrases or sentences that enhanced an initial idea, showing students various ways to express their thoughts more effectively. Moreover, he stated that AI writing tools could demonstrate how an idea could be developed and supported with evidence or arguments, which he believed was especially beneficial in academic writing. The teacher response as follows:

> AI writing tools have shown a positive impact on students' ability to elaborate on their thoughts. These tools often provide phrases or sentences that extend an initial idea, enabling students to see different ways in which they can express their thoughts more effectively. Furthermore, these tools can show how an idea can be developed and supported with evidence or arguments, which can be particularly useful in academic writing. (T4)

In summary, these responses suggested a spectrum of views on the influence of AI writing tools on students' creativity and idea generation, underscoring both potential benefits and drawbacks. While some teachers viewed these tools as useful aids for overcoming creative blocks and developing ideas, others warned against over-reliance and the risk of limiting critical thinking and personal creativity. The overall message underscored the need for a balanced use of AI tools, fostering both creative assistance and independent thought.

*4.2.1.2. Vocabulary and language use.* In relation to the vocabulary and language use, each teacher had drawn attention to a specific aspect, while acknowledging both benefits and potential downsides. T1, for instance, had underscored the positive influence of AI writing tools on enhancing students' vocabulary. He suggested that these tools recommended synonyms or more advanced words that students might not have considered, thereby expanding their lexical repertoire and enabling them to express their ideas more precisely and engagingly. Over time, he believed this led to more advanced and polished writing.

> I have noticed a significant positive impact of AI writing tools on students' vocabulary use. These tools often suggest synonyms or more sophisticated words that students might not have thought to use on their own. As a result, students' lexical repertoire expands, and they can express their thoughts in a more nuanced and engaging way. Over time, their writing becomes more advanced and polished. (T1)

T2, however, had introduced a note of caution. She had expressed worries that AI writing tools could sometimes result in overcomplicated language. While she acknowledged the potential of

these tools to provide students with a more complex vocabulary, she voiced concerns that students might use these words without fully understanding their context or connotations, which could lead to awkward or excessively formal writing. She emphasized that while expanding vocabulary was beneficial, the primary goals should always be clarity and precision. The transcript of the interview is provided below:

> . . . While these tools can provide students with more complex vocabulary, students may use these words without fully understanding their context or connotations. This can lead to sentences that sound awkward or overly formal. (T2)

T3 presented a more balanced view, acknowledging the usefulness of AI writing tools as a learning resource for expanding vocabulary. However, he also cautioned against an over-reliance on these tools. He expressed concerns that students might not make an effort to recall and use the new vocabulary independently. Further, he warned that this could potentially slow students' vocabulary acquisition over the long term. Emphasizing the need for balance, he stressed the importance of using these tools as a supplementary aid rather than a crutch. The excerpt from the interview is displayed below:

> AI writing tools can provide a helpful learning resource for students to learn and use new vocabulary. However, there is a risk of students becoming overly reliant on these tools and not making the effort to remember and independently use the new words they encounter. (T3)

Lastly, T4 took the conversation in a slightly different direction, focusing on the role of AI writing tools in reducing repetition in students' writing. He argued that these tools could suggest varied vocabulary to replace frequently used words or phrases, thereby enhancing the quality of their writing and prompting students to incorporate new vocabulary into their work.

> . . .when a student tends to use a particular word or phrase frequently, the tool can suggest different options to diversify the language used. This not only enhances the overall quality of their writing but also encourages students to incorporate new vocabulary into their work. (T4)

### 4.2.2. Impact on writing organization

As for the aspect of organization, we also distinguished two prominent sub-themes: "Coherence and Logical Flow" and "Use of Transition Words and Phrases". "Coherence and Logical Flow" explores how AI writing tools impact students' ability to construct logical and cohesive arguments or narratives. Meanwhile, "Use of Transition Words and Phrases" centers on whether these tools assist students in effectively using transitional language elements to link ideas, thus enhancing the fluidity of their writing.

*4.2.2.1. Coherence and logical flow.*  The responses of the four teachers presented a comprehensive picture of the benefits of AI writing tools in enhancing students' writing skills. Each teacher provided insights into a distinct facet of these tools and their impact on the writing process.

Firstly, T1 underscored the overall positive impact of AI writing tools, emphasizing their role in fostering a clear, logical flow of thoughts. T1 noted how these tools helped in suggesting better phrasing, removing redundancies, and enhancing coherence, which subsequently improved students' confidence in their writing abilities. The teacher's response is presented below.

> . . . The tools facilitate a clear, logical flow of thoughts by suggesting better phrasing, removing redundancies, and enhancing coherence. Students tend to write more confidently knowing that the tool is there to guide them . . . . (T1)

Secondly, T2 offered a balanced perspective, reflecting both on the positives and potential downsides of these tools. T2 highlighted the assistance provided by AI in organizing thoughts, structuring arguments, and identifying logical gaps. Yet, T2 also raised concerns about possible over-reliance on these tools, which could have inadvertently led students to overlook the development of their own critical thinking and problem-solving skills, fundamental to effective writing. The pieces of their interview is presented as follow:

> …these tools are great for helping students organize their thoughts, structure their arguments, and identify gaps in their logic. …. however, students may become over-reliant on these tools, leading them to overlook their development in critical thinking and problem-solving skills integral to effective writing. (T2)

Next, T3 built upon these insights by focusing on the instant feedback provided by AI writing tools. According to T3, these tools served as an invaluable aid in structuring arguments, identifying logical inconsistencies, and encouraging clear communication. The ability to correct and learn from mistakes in real-time reinforced students' understanding of good writing practices and contributed significantly to their writing skill improvement over time. The response is presented below:

> … AI writing tools offer invaluable aid in structuring arguments, identifying logical inconsistencies, and encouraging clear communication. The instant feedback they provide allows students to correct and learn from their mistakes in real-time, thereby reinforcing their understanding of good writing practices. (T3)

Lastly, T4 highlighted the role of AI tools as personalized writing tutors. This teacher emphasized their effectiveness in providing grammar suggestions, enhancing vocabulary usage, and ensuring logical continuity of arguments. In T4's perspective, the AI writing tools had been instrumental in elevating students' writing capabilities, particularly in creating logically coherent and flowing pieces of writing. The interview transcript is presented below.

> AI writing tools have been instrumental in elevating students' writing capabilities, especially in creating logically coherent and flowing pieces of writing. By providing grammar suggestions, enhancing vocabulary usage, and ensuring logical continuity of arguments, these tools have effectively functioned as personalized writing tutors. (T4)

*4.2.2.2. Use of transition words and phrases.* The four teachers' statements are all in agreement regarding the impact of AI writing tools on students' use of transition words and phrases in their writing. They all stress the significant improvement in the quality of writing resulting from the adoption of such AI tools.

T1 had spoken positively about the impact of AI writing tools on students' writing, emphasizing an observed improvement in the use of transition words and phrases. They highlighted the educational nature of the tools, comparing them to an "interactive tutorial" that had helped students better understand the function and application of transitional elements in text. This suggested that T1 had seen AI tools as effective complementary educational resources. A portion of the interview transcript can be found below:

> "Yes, I have certainly noticed a substantial improvement in students' use of transition words and phrases after we incorporated AI writing tools into our program. The AI tool has helped them understand the application of such transitional elements in a text, which consequently improved the flow and organization of their written works. It's like they have an ongoing interactive tutorial that guides them in developing better writing techniques". (T1)

Following this, T2 also recognized the benefits of AI writing tools in enhancing the use of transitional elements. They mentioned improvements in sentence flow and cohesion. However, differing slightly from T1, T2 offered a more nuanced perspective by raising potential concerns regarding the dependency on these tools. They warned that over-reliance might impact students' creativity

and unique writing styles. This had suggested that while T2 appreciated the benefits of the tools, they also recognized the need for balanced use. The transcript the interview can be seen below.

> "Yes, indeed, there's a noticeable improvement in the way students use transition words and phrases after incorporating AI writing tools. Their sentences seem to flow better, with clearer connections between ideas, suggesting a better understanding of cohesion in writing. Nevertheless, it's also worth noting that, on the flip side, some students may become overly dependent on these tools, running the risk of stifling their personal creativity and unique writing styles. As with all technologies, the key lies in balanced use and ongoing guidance". (T2)

Subsequently, T3 emphasized the immediacy of the impact that AI writing tools could have had on student writing. They spoke about how the tools offered real-time prompts that helped students incorporate transitional elements while their thoughts were still fresh, contributing to improved organization and clarity. T3 s perspective seemed to focus on the capacity of AI writing tools to promote active and timely learning. The interview transcript is presented below.

> "Honestly, there has been a noticeable enhancement in students ability to logically connect their ideas using transition words and phrases after the adoption of AI writing tools. The AI models offer real-time prompts, ensuring students incorporate these vital elements while the ideas are still fresh in their minds. This way, the organization and clarity of their essays significantly improve". (T3) "Honestly, there has been a noticeable enhancement in students

Finally, T4 provided a before-and-after comparison, which implied a significant improvement in students' writing after the introduction of AI tools. He spoke to the tools' potential in facilitating smoother transitions between ideas and improved coherence and organization in writing. This suggested T4 perceived the AI tools as beneficial for mitigating common writing issues and enhancing overall writing quality. The teacher's response is presented below.

> "AI writing tools have definitely made a difference. Prior to their use, students would often skip transition words or misuse them, leading to disjointed writing. However, with the AI tools' guidance, the students have started to see how these transitions provide a smooth pathway from one idea to the next, and have begun using them more effectively. This tool has undeniably facilitated better organization and coherence in students' writing". (T4)

In conclusion, all the responses were largely positive about the impact of AI writing tools on students' writing, although they each focused on slightly different benefits. However, T2 had injected a note of caution about potential over-reliance on the tools, hinting at the importance of maintaining a balance in their use.

## 5. Discussion

The objective of this study was to explore the various types of AI writing tools and their influence on the quality of student writing—particularly in terms of content and organization—as perceived by EFL (English as a Foreign Language) teachers. The initial findings of the current research underscored the diverse array of Artificial Intelligence (AI) writing tools (e.g., Quilbot, Jenni, Chat-GPT, WordTune, Copy.ai, Paperpal and Essay writer) utilized by teachers of English as a Foreign Language (EFL). The EFL teachers shared a common interest in utilizing a combination of AI tools in enhancing students' writing skills, hinting at the fundamental trend of embedding technology into education. This is in line with the work of C. Liu et al. (2021), who emphasized the incorporation of multiple AI tools in enhancing the teaching-learning process. In their study, they observed that a combination of AI tools can foster a more comprehensive learning environment, especially for enhancing writing skills in EFL students. Similarly, Ouyang et al. (2022) studied the impact of AI in education, and their findings corroborate our research. They noted a growing trend among teachers to use a blend of AI tools to enrich the learning experience and found that this had a positive impact on students' overall academic performance, including their writing skills.

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The second findings from our research examined the impact of AI writing tools on the content and organization of second-language writing. In the realm of content, which refers to the generation of ideas and their articulation, AI writing tools have shown promising potential. Wong and Mak (2019) note that the content of L2 writing, in particular, is often shaped by students' linguistic abilities and their cultural backgrounds. AI writing tools, with their capacity for providing prompts and suggesting improvements, can support students in articulating their thoughts and enhancing the richness of their content (Y. Liu et al., 2023). Moreover, a study by Gayed et al. (2022) found that AI writing tools can be instrumental in fostering idea development, thus aiding students in overcoming creative blocks. This aligns with our findings, where teachers (T1, T3 & T4) acknowledged these tools as beneficial for nurturing idea generation. However, potential downsides were also noted, such as the risk of over-reliance on these tools potentially limiting critical thinking and personal creativity, as raised by T2 and supported by Huang and Tan (2023). They argued that excessive dependence on AI technologies may decrease one's ability to think creatively and critically, as well as impair the capacity to make autonomous assessments regarding the standard of writing.

In terms of organization, which encompasses the logical arrangement and coherence of ideas, AI writing tools have been found to provide valuable assistance. According to Bowen and Thomas (2020), the organization of ideas is a critical component of L2 writing, and students often struggle with establishing coherence and logical progression in their texts. Here, AI writing tools can provide instantaneous feedback and suggestions for reorganizing sentences and paragraphs, thus helping students improve the structure of their writing (T. S. Chang et al., 2021). In our study, all four participating teachers (T1, T2, T3, and T4) recognized the positive role of AI writing tools in enhancing the clarity of student writing and promoting a logical progression of thoughts and arguments. These findings align with the research by Malik et al. (2023), who suggested that AI tools can be instrumental in improving the organization of L2 writing. However, it is also crucial to note the potential risks.

Additionally, the teachers in this study (T1, T2, T3, & T4) presented diverse perspectives on the influence of AI writing tools on students' vocabulary use and growth. While certain participants (i.e., T1, T3, & T4) recognized apparent advantages, such as vocabulary enhancement and minimization of repetition, others (i.e., T2) urged caution about potential downsides, including overly complex language and an excessive dependence on these tools. Again, this is supported by the research conducted by Gayed et al. (2022). They too investigated the impact of AI writing tools on students' vocabulary use and development. They found that these tools offer clear advantages, such as broadening vocabulary and reducing repetitive language use. Furthermore, the study by Fitria (2021) aligns with our findings. They underlined the role of AI tools in enhancing vocabulary but also cautioned against over-dependence, emphasizing the importance of these tools being used as aids rather than substitutes for comprehensive language learning.

The next point of discussion focused on the teachers' views regarding the impact of AI writing tools on organizational aspects of writing. All four teachers (T1, T2, T3, and T4) recognized the positive role these tools play in enhancing the clarity of student writing and promoting a logical progression of thoughts and arguments. They unanimously agreed on the tools' proficiency in recommending more effective wording, detecting logical inconsistencies, and aiding in the organization of arguments. However, T2 provided a balanced perspective, appreciating both the benefits and potential drawbacks of these tools. Particularly, T2 expressed concern over the possibility that students could become overly reliant on these tools, which could inadvertently inhibit the growth of their critical thinking and problem-solving skills. This concern aligns with the findings of Malik et al. (2023), who suggested that excessive reliance on AI tools can result in reduced efforts in critical thinking among students.

The study has a few limitations, however, that need to be addressed. One potential limitation is the possible bias in participant selection. The teachers who participated in our research are

currently using and actively promoting the use of AI writing tools, which could predispose the findings towards more positive experiences and attitudes. Acknowledging this, it is recommended that future research should include teachers who have tried these tools but have decided not to continue using them. This would present a more balanced perspective and help in understanding the reasons for discontinuation and any potential barriers to effective implementation of these tools in the classroom.

## 6. Conclusion

This study aimed to examine various types of AI writing tools and their influence on the quality of student writing, focusing on content and organization, from the perspective of EFL teachers. The findings revealed a diverse array of AI writing tools employed in EFL teaching and shed light on the strategies teachers use to integrate these tools to address students' writing challenges. In particular, the tools, including Quillbot, Jenni, Chat-GPT, WordTune, Copy.ai, Paperpal, and Essay writer, were found to foster a comprehensive learning environment and enrich students' overall academic performance. The study also found unanimous agreement among the teachers about the positive role of AI writing tools in enhancing the clarity and logical progression of students' writing. However, concerns were expressed about the possibility of students becoming overly reliant on these tools, which could inhibit their critical thinking and problem-solving skills. The study's implications suggest the integration of AI writing tools can be beneficial in enhancing the quality of EFL student writing.

While the present study provides insightful revelations regarding the use of AI writing tools in EFL classrooms, there are several limitations that should be noted. Firstly, the data was obtained from only four EFL teachers from three universities in Indonesia, which limits the breadth of the study. Different regions may have varying degrees of access to technology, resources, and the attitudes of teachers towards AI tools, and this study may not fully represent the experiences of teachers in different contexts. Additionally, the teachers who participated in our research are currently using and actively promoting the use of AI writing tools, which could predispose the findings towards more positive experiences and attitudes. This potential bias in participant selection should be acknowledged. To address this limitation, it is recommended that future research includes teachers who have tried these tools but have decided not to continue using them. This would present a more balanced perspective and help in understanding the reasons for discontinuation and any potential barriers to effective implementation of these tools in the classroom. Furthermore, the study focused solely on teachers' perceptions and did not incorporate students' views or measure their actual improvements in writing skills due to the use of these AI tools. Therefore, it may not present a complete picture of the impact of AI writing tools on students' writing quality. Furthermore, the research did not examine the long-term effects of using AI tools on students' writing skills, nor did it investigate the potential negative effects of students' over-dependence on AI tools, which was a concern raised by some teachers. It is important to address these limitations in future research to gain a more comprehensive understanding of the implications and potential drawbacks associated with the use of AI writing tools in EFL classrooms

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**Disclosure statement**
No potential conflict of interest was reported by the author(s).

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