

Perceptions of English Education Students on AI-Powered Tools for Developing Writing Skills: A Quantitative Survey Study Among Universities

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Abstract

This study explores English education students' perceptions of AI-powered tools in developing writing skills through a quantitative survey administered to students across various Indonesian universities. The research employs a structured questionnaire to gather insights on the effectiveness, usability, and impact of tools such as Grammarly, Quillbot, and ChatGPT on students' writing practices. Key findings indicate a general positive perception among students, highlighting the tools' role in enhancing writing quality and accessibility. The study also examines variations in perception based on students' levels of familiarity with these tools, providing a nuanced understanding of their practical benefits and limitations. This investigation contributes to the growing discourse on the integration of AI in educational contexts and offers valuable insights for future research and practical applications in English language teaching.

Keywords: *Artificial intelligence, writing tools, EFL, Indonesian universities, student perception*

INTRODUCTION

The essence of writing is one of the most challenging components of English language ability, particularly in an EFL environment (Anam, 2021). This is due to the fact that procedural processes and complex parts must be used to generate a quality piece of writing. Writing becomes highly difficult for teachers to educate students using proper strategies and for students to build their writing competencies (Syam, 2020; Noor, 2016). Furthermore, the requirement to pass the writing course is more than a one-day procedure; students require many attempts to develop their writing talents (Styati & Irawati, 2020). Aside from that, writing is

one of the most formidable skills for students to master, even if there is often a dismissive attitude toward the necessity of writing skills for students (Jabali, 2018).

Writing is commonly regarded as a multifaceted undertaking encompassing cognitive, emotional, and social mechanisms (Chang et al., 2021). Students' incapacity to effectively articulate their ideas in written form is a significant issue that can impact the educational process (Kovach et al., 2012). Demonstrating simultaneous control over multiple variables is a challenging task for most students. At the level of individual sentences, these encompass the regulation of content, arrangement, syntax, lexicon, grammar, orthography, and calligraphy. Lichtinger (2018) states that practical writing goes beyond constructing individual sentences. It necessitates arranging and consolidating information into cohesive and well-structured paragraphs and texts.

According to Wen and Walters (2022), using a teaching approach that does not involve performances generated by the students themselves may not effectively foster students' motivation to engage in writing. Based on this, students made mistakes in completing their writing assessments, such as plagiarism and mistakes in using grammar. Plagiarism in writing is still a hot topic, and its existence is detrimental to other writers whose work is copied without acknowledgment. In this scenario, instructors and researchers identify plagiarism in students' papers (Choi, 2012). Various scholars are concerned about plagiarism, as most students utilize copying as a primary tactic in writing texts in various contexts of writing classes (Fazilatfar et al., 2018). Many students in another research context discovered that teachers' most difficult challenge when teaching writing is that most pupils plagiarize word for word (Hayuningrum, 2021). As a result, professors must also work hard to ensure that their students do not commit plagiarism (Choi, 2012).

Furthermore, not only is there a problem with plagiarism, a widespread issue in recent years, but students' difficulties with paraphrasing must also be addressed. Much research has shown that EFL students encounter difficulties paraphrasing their writing assignments (Frodesen, 2007; Sun, 2009; Akbar, 2020). It is particularly challenging for them to articulate how to perform a decent paraphrase of text (Choy & Lee, 2012). Students have limitations in terms of word choice (Derakhshan & Shirejini, 2020), grammatical terms when paraphrasing (Mataram, 2021), abilities to modify sentence structures, and discovering academic terminology and synonyms (Choy & Lee, 2012; Na et al., 2017). Aside from that, knowing how to paraphrase reading material is advantageous.

The integration of Artificial Intelligence (AI) in educational tools has significantly influenced language learning processes. In this study, to reveal Technology-Enhanced Language Learning, AI-powered tools, such as Quillbot and Grammarly, are used as Technology-Enhanced Paraphrasing Tools (TEPT) to make it easier for students to paraphrase because they are valuable online applications that work for paraphrasing, avoiding plagiarism, smoothing sentences, and accommodating proper grammar (Fitria, 2021). Grammarly Premium is an auto correction system that can identify errors related to 250 grammar rules (Grammarly Inc., 2017). Quillbot offers a product that uses artificial intelligence (AI) to suggest paraphrases (Dale, 2020).

Research on the use of Artificial Intelligence has been carried out extensively. However, how students perceive AI tools in the context of writing has yet to be fully explored. This study investigates the use of AI-powered writing tools by EFL students in completing their writing assessments. Specifically, this research focuses on the perceptions of students in English Education programs across various universities in Indonesia regarding the effectiveness, accessibility, and ease of use of AI-powered tools in developing their writing skills. Understanding the role of AI in enhancing writing proficiency can guide educators in adopting effective teaching strategies.

Literature Review

Artificial Intelligence (AI) is a field of study dedicated to creating intelligent machines capable of performing tasks that typically require human intelligence. Initially conceptualized in 1956 by John McCarthy as "the science and engineering of creating intelligent machines," AI has evolved significantly with advancements in natural language processing, neural networks, and machine learning (Mondal, 2020).

In education, AI holds immense promise for transforming traditional learning and teaching methodologies. AI technologies such as intelligent tutoring systems (ITS), adaptive learning management systems, and chatbots are revolutionizing educational practices by personalizing learning experiences and providing real-time feedback to students (Baker & Smith, 2019). These systems can analyze vast amounts of data to tailor educational content and pacing according to individual student needs, thereby enhancing learning outcomes and engagement.

Moreover, AI-powered tools assist educators in administrative tasks, automate grading and feedback processes, and detect plagiarism, thereby saving time and improving instructional efficiency (Baker & Smith, 2019). This capability not only supports teachers in managing

classrooms more effectively but also allows them to focus more on personalized instruction and student support.

Ethical considerations surrounding AI in education are paramount. Debates persist regarding the ethical implications of AI technologies in educational settings, particularly concerning privacy, data security, and the potential bias in algorithms (Haugeland, 1985; Baker & Smith, 2019). Moreover, there is ongoing discourse on whether AI systems can truly replicate human cognitive abilities or consciousness, which raises philosophical and ethical questions about the role of AI in shaping educational experiences (Russel & Norvig, 2010).

In summary, the integration of AI in education represents a significant paradigm shift, offering opportunities to enhance learning experiences, optimize educational processes, and address complex educational challenges. However, it is crucial to conduct further research and critical evaluation to maximize the benefits of AI while mitigating potential risks and ethical concerns in educational settings.

RESEARCH METHODS

a. Research Design

This study adopts a quantitative research design employing a survey questionnaire to investigate the perceptions of English Education students regarding AI-powered tools in enhancing their writing skills.

Research Approach: *Quantitative survey study.*

b. Participants

Participants included students enrolled in English Education programs across various universities in Indonesia. The selection criteria on students actively engaged in academic writing tasks.

c. Data Collection Procedure

Survey Instrument: A structured questionnaire developed using Google Forms. The questionnaire will be designed to gather data on students' perceptions and experiences with AI-powered writing tools. It will include Likert scale questions to measure effectiveness, ease of use, impact on writing quality (grammar, vocabulary), and concerns about privacy and cybersecurity.

Data Collection Strategy: The survey administered online to ensure broad participation and to accommodate students' schedules. Participants will be encouraged to provide detailed responses to open-ended questions to enrich quantitative data.

Data Analysis: Quantitative data analysis conducted using Excel. Descriptive statistics such as frequencies, means, and standard deviations will be calculated to summarize responses to Likert scale items. Cross-tabulations and correlations may be used to explore relationships between variables related to AI tool effectiveness and student outcomes.

Integration of Findings: Findings from the survey analyzed to provide insights into students' perceptions of AI-powered writing tools. The results will inform conclusions about the effectiveness, usability, and impact of these tools on students' writing skills in an educational context.

FINDING AND DISCUSSION

a. Finding

A thousand participants complete the questionnaire that has been filled out using Google Forms. The data collected from English as a Foreign Language (EFL) students who are currently enrolled in public and private colleges in Indonesia. The English Education students mentioned are currently using AI tools for writing assignments and developing writing skills using AI tools such as Quillbot, ChatGPT, and Grammarly.

The questionnaire was adapted from Pirman and friends' research. It contains 20 indicator statements that cover many aspects such as the effectiveness of the tool component in composing final assignments, the advantages and disadvantages of the application, and the students' levels of interest and motivation. Based on the reliability test results, the value of Cronbach's alpha is more significant than 0.878, as shown in Table 1, which offers the reliability of the questionnaire. While closed questions were analyzed using IBM SPSS Statistics 25.

Reliability of questionnaire items

Table 1.

Reliability Statistics	
Cronbach's Alpha	N Of Items
.878	20

On the questionnaire sheet, the researcher used a Likert scale from Podsén (1997) to measure the attitude of lecturers, where all questions have several choices, such as strongly

agree (SA), agree (A), undecided (U), and disagree (D), or strongly disagree (SD). Point values for positive statements: SA = 5, A = 4, U = 3, D = 2, and SD = 1. For negative statements, the scale is scored inversely. The statements in the questionnaire include the components of an effective tool for developing writing skills (Items No. 1, 2, 3, 5, 17), the advantages of Artificial Intelligence (Items No. 6, 7, 8, 10, 16, 19), the disadvantages of Artificial Intelligence (Items No. 11, 12, 13, 18), Student Interests (Item No. 4), and Student Motivation (Items No. 9, 14, 15, 20). The data from the questionnaire is converted into percentages, as presented below.

Student's responses to the use of AI

Table 2.

No.	Statement	SD		D		N		A		SA		Total	
		F	%	F	%	F	%	F	%	F	%	F	%
1.	Quillbot, ChatGPT, and Grammarly are very easy to access and use anywhere and anytime.	2	2	-	-	5	5	39	39	55	55	100	100
2.	The features contained in AI are very easy for students to understand.	1	1	1	1	16	16	51	51	31	31	100	100
3.	The features contained in AI are very suitable for the needs of students in writing assignments.	1	1	-	-	27	27	49	49	23	23	100	100
4.	I am very interested in using this AI, which will help me to complete my writing assignments faster.	2	2	2	2	25	25	44	44	27	27	100	100
5.	Using AI makes me more comfortable doing my writing assignments.	2	2	3	3	29	29	46	46	20	20	100	100
6.	Quillbot, ChatGPT, and Grammarly help me to produce better writing.	4	4	1	1	16	16	53	53	27	27	100	100
7.	The AI helps me paraphrase and choose the right grammar.	2	2	3	3	15	15	49	49	31	31	100	100
8.	I am more active in completing my writing assignments due to the use of AI.	3	3	11	11	38	38	34	34	14	14	100	100
9.	The use of AI will improve my writing skills.	3	3	14	14	32	32	40	40	12	12	100	100
10.	I know a lot of vocabulary and have mastered proper grammar while using the AI.	3	3	8	8	36	36	42	42	11	11	100	100
11.	The use of AI disturbs my concentration in writing assignments.	96	96	12	12	43	43	12	12	-	-	100	100
12.	I am worried that AI will further intrude on my privacy.	97	97	94	94	67	67	35	35	6	6	100	100

13.	I am worried about cyber security (hacking and password protection).	97	97	95	95	87	87	66	66	28	28	100	100
14.	Using AI motivates me to improve the quality of my writing and write more frequently.	3	3	9	9	39	39	33	33	15	15	100	100
15.	I recommend the use of AI tools (Quillbot, ChatGPT, and Grammarly) to other students for enhancing their writing skills.	2	2	6	6	34	34	44	44	13	13	100	100
16.	I believe AI tools can help reduce the time needed to edit and revise my writing.	3	3	3	3	17	17	55	55	23	23	100	100
17.	I feel more confident about the quality of my writing assignments when using AI tools.	3	3	14	14	26	26	45	45	11	11	100	100
18.	I am concerned that relying too much on AI tools might hinder my ability to write independently.	98	98	52	52	16	16	3	33	1	1	100	100
19.	I find that AI tools provide useful suggestions that improve the overall coherence of my writing.	2	2	1	1	33	33	54	54	10	10	100	100
20.	I believe that AI tools can offer personalized feedback that is as valuable as feedback from instructors.	2	2	11	11	45	45	32	32	9	9	100	100

The results show that the majority of participants hold a positive view on using Artificial Intelligence as a writing tool for developing writing skills. Ratings ranged from 2.21 to 4.47, with standard deviations ranging from 0.688 to 1.047. Regarding attitudes, the average score for the effectiveness of using AI is 20, and for its benefits, it is 20.06. Conversely, the average score for the disadvantages of AI use is 50.25. Student interest in AI utilization is reported at 20, while motivation scores 19.9. These data are presented in Table 2.

Descriptive statistics for questionnaire items

Table 3.

No.	Statements	N	Mean	Std. Deviation
1.	Quillbot, ChatGPT, and Grammarly are very easy to access and use anywhere and anytime.	100	4.47	.688
2.	The features contained in AI are very easy for students to understand.	100	4.10	.771
3.	The features contained in AI are very suitable for the needs of students in writing assignments.	100	3.93	.768
4.	I am very interested in using this AI, which will help me to complete my writing assignments faster.	100	3.92	.883
5.	Using AI makes me more comfortable doing my writing assignments.	100	3.79	.868
6.	Quillbot, ChatGPT, and Grammarly help me to produce better writing.	100	4.00	.864
7.	The AI helps me paraphrase and choose the right grammar.	100	4.04	.875
8.	I am more active in completing my writing assignments due to the use of AI.	100	3.47	.936
9.	The use of AI will improve my writing skills.	100	3.46	.947
10.	I know a lot of vocabulary and have mastered proper grammar while using the AI.	100	3.50	.904
11.	The use of AI disturbs my concentration in writing assignments.	100	3.52	.846
12.	I am worried that AI will further intrude on my privacy.	100	2.97	1.009
13.	I am worried about cyber security (hacking and password protection).	100	2.21	1.047
14.	Using AI motivates me to improve the quality of my writing and write more frequently.	100	3.48	.958
15.	I recommend the use of AI tools (Quillbot, ChatGPT, and Grammarly) to other students for enhancing their writing skills.	100	3.60	.864
16.	I believe AI tools can help reduce the time needed to edit and revise my writing.	100	3.94	.838
17.	I feel more confident about the quality of my writing assignments when using AI tools.	100	3.47	.968
18.	I am concerned that relying too much on AI tools might hinder my ability to write independently.	100	4.28	.841
19.	I find that AI tools provide useful suggestions that improve the overall coherence of my writing.	100	3.69	.747
20.	I believe that AI tools can offer personalized feedback that is as valuable as feedback from instructors.	100	3.35	.868
Valid N (listwise)		100		

1. The Effectiveness of Using Artificial Intelligence as Writing Tools

The effectiveness of using ai

Table 4.

No.	Statement	SD		D		N		A		SA		Total	
		F	%	F	%	F	%	F	%	F	%	F	%
1.	Quillbot, ChatGPT, and Grammarly are very easy to access and use anywhere and anytime.	2	2	-	-	5	5	39	39	55	55	100	100
2.	The features contained in AI are very easy for students to understand.	1	1	1	1	16	16	51	51	31	31	100	100
3.	The features contained in AI are very suitable for the needs of students in writing assignments.	1	1	-	-	27	27	49	49	23	23	100	100
5.	Using AI makes me more comfortable doing my writing assignments.	2	2	3	3	29	29	46	46	20	20	100	100
17.	I feel more confident about the quality of my writing assignments when using AI tools.	3	3	14	14	26	26	45	45	11	11	100	100

Based on the data above can affect the high effectiveness of using Artificial Intelligence as a writing tool to develop writing skills. Based on the data that has been presented, the highest value in the first statement is 55%, which shows a significant level of conformity among other findings. Likewise, the second statement with the highest value recorded at 51%, already shows conformity among the other results. Almost the same as the previous statement, the third and fifth statements show quite high results with a difference of 3%, 49% for the third and 46% for the fifth. So, it can be concluded that the AI device helps students improve their writing skills in completing assignments. Meanwhile, for the seventeenth statement, it can be seen that the research results with a value of 45% indicate that they have a high level of self-confidence and produce quality writing with AI tools.

2. The advantages of using Artificial Intelligence as writing tools

The advantages using AI

Table 5.

No.	Statement	SD		D		N		A		SA		Total	
		F	%	F	%	F	%	F	%	F	%	F	%
6.	Quillbot, ChatGPT, and Grammarly help me to produce better writing.	4	4	1	1	16	16	53	53	27	27	100	100
7.	The AI helps me paraphrase and choose the right grammar.	2	2	3	3	15	15	49	49	31	31	100	100

8.	I am more active in completing my writing assignments due to the use of AI.	3	3	11	11	38	38	34	34	14	14	100	100
10.	I know a lot of vocabulary and have mastered proper grammar while using the AI.	3	3	8	8	36	36	42	42	11	11	100	100
16.	I believe AI tools can help reduce the time needed to edit and revise my writing.	3	3	3	3	17	17	55	55	23	23	100	100
19.	I find that AI tools provide useful suggestions that improve the overall coherence of my writing.	2	2	1	1	33	33	54	54	10	10	100	100

Based on the data provided, employing Artificial Intelligence for developing writing skills offers numerous benefits. The survey results indicate distinct trends: the sixth statement garnered 53% approval, while the seventh statement received 54%. The eleventh statement had higher values for neutral responses which is 38%. The tenth statement achieved a score of 42%. The sixteenth statement achieved a higher score of 55% highlighting significant agreement among respondents regarding the advantages of AI as a writing tool which can reduce the time for revising it. Conversely, insights gathered from student interviews underscore the advantages of using tools like Quillbot and Grammarly. Students noted these tools facilitate easier paraphrasing, provide novel vocabulary suggestions, and ensure correct grammar usage, thus alleviating concerns about errors. The nineteenth statement similarly gets a higher score of 54%, there are significant results for correct writing using coherence from suggestions that are recommended by AI.

3. The Interests of Using Artificial Intelligence as Writing Tools

The interests of using AI

Table 6.

No.	Statement	SD		D		N		A		SA		Total	
		F	%	F	%	F	%	F	%	F	%	F	%
4.	I am very interested in using this AI, which will help me to complete my writing assignments faster.	2	2	2	2	25	25	44	44	27	27	100	100

The data reveals a strong student inclination towards utilizing Artificial Intelligence. The highest recorded score is 44%, indicating a significant preference for using AI tools to complete writing assignments. This underscores students' keen interest in leveraging AI for academic tasks. Especially for beneficial features such as effective content rephrasing, accessibility of user-friendly applications, and capability to ensure grammatical precision. Ten respondents affirmed students' high interest in utilizing Artificial Intelligence to aid in writing assignments completion.

4. The Students Motivation of Using Artificial Intelligence as Writing Tools

The student's motivation of using AI

Table 7.

No.	Statement	SD		D		N		A		SA		Total	
		F	%	F	%	F	%	F	%	F	%	F	%
9.	The use of AI will improve my writing skills.	3	3	14	14	32	32	40	40	12	12	100	100
14.	Using AI motivates me to improve the quality of my writing and write more frequently.	3	3	9	9	39	39	33	33	15	15	100	100
15.	I recommend the use of AI tools (Quillbot, ChatGPT, and Grammarly) to other students for enhancing their writing skills.	2	2	6	6	34	34	44	44	13	13	100	100
20.	I believe that AI tools can offer personalized feedback that is as valuable as feedback from instructors.	2	2	11	11	45	45	32	32	9	9	100	100

Based on the data available, the use of Artificial Intelligence to assist in improving their writing skills encourages them to write more frequently. They also recommend several tools such as Quillbot, ChatGPT, and Grammarly for enhancing their writing skills. The statement achieving the highest score, statement number nine, received 40%. Statement number 14 scored 39%, and statement number 15 received 44%. These findings indicate that Artificial Intelligence quite plays a pivotal role in enhancing students' writing skills. The twentieth statement got a higher score of 45%, the AI tools give personalized feedback as valuable from instructors.

According to the data, students demonstrate significant motivation when utilizing Quillbot and Grammarly. They are motivated to expedite their developing writing skills with the assistance of these AI systems, which facilitate tasks such as paraphrasing, grammar correction, and overall improvement of their work. Make it easy for them to know how to get more valuable personalized feedback.

5. The Disadvantages of Using Artificial Intelligence as Writing Tools

The disadvantages using AI

Table 8.

No.	Statement	SD		D		N		A		SA		Total	
		F	%	F	%	F	%	F	%	F	%	F	%
11.	The use of AI disturbs my concentration in writing assignments.	96	96	12	12	43	43	12	12	-	-	100	100

12.	I am worried that AI will further intrude on my privacy.	97	97	94	94	67	67	35	35	6	6	100	100
13.	I am worried about cyber security (hacking and password protection).	97	97	95	95	87	87	66	66	28	28	100	100
18.	I am concerned that relying too much on AI tools might hinder my ability to write independently.	98	98	52	52	16	16	3	3	1	1	100	100

From data above, there are several weaknesses in using Artificial Intelligence which are indeed dangerous and concern account security. Other than that, artificial intelligence does not really have many advantages. With a score of 98%, the eleventh statement is the most disagreeable. With the highest score of 97%, the twelfth and thirteenth statement expressed disagreement with the supplied statement. Concurrently, the eleventh statement, which received the highest rating of 96%, concurred with a disadvantage of artificial intelligence in terms of online safety. These four assertions suggest that there are certain drawbacks to the use of artificial intelligence.

Furthermore, there is evidence that when using Quillbot and Grammarly, they take precautions to safeguard their online safety. Students' express reservations about using these writing tools. The vulnerability of internet-based tools to cyberattacks is their weakness.

b. Discussion

This research was conducted because the students nowadays uses of AI tools in demand by students to help doing writing assignments and make it easier to find several diverse word choices. Especially for writing assignments that require the ability to select and use vocabulary in a sentence that will become a paragraph. It required a grammar and coherence for the quality of the writing. In this case, online paraphrasing tools useful for helping accurate grammar application have been shown to have a great impact on student writing outcomes (Choi, 2012; Fitria, 2021). Therefore, the ease of technology in the form of paraphrasing tools such as Quilbot is one of the factors that encourage the development of students' writing skills. This interest in the use of Artificial Intelligence tools also increases students' confidence to complete tasks faster and revise more practically. The use of AI assistance increases students' confidence for better writing quality because there are already features that provide several choices of words and words for good grammar in formulating sentences that will be used in their writing.

This study investigated the utilization of AI tools Quillbot, ChatGPT, and Grammarly in writing assignments by EFL students. While existing research has examined the efficacy

of these tools in improving grammar, coherence, and overall writing quality, gaps remain in understanding students' comprehensive perceptions and the broader implications of these tools on their learning experiences. Previous studies have largely focused on isolated aspects of AI tools, such as their grammatical correction capabilities or their impact on plagiarism detection. By addressing these gaps, this study provides a more holistic view of how these tools affect writing processes, learning outcomes, and students' attitudes toward technology in education.

Summarizing Key Findings:

Our study reveals that students perceive AI tools as highly beneficial for enhancing their writing skills. Specifically, tools like Quillbot, ChatGPT, and Grammarly were praised for their user-friendly interfaces and effectiveness in providing real-time feedback on writing. Students reported that these tools significantly boosted their confidence, improved their understanding of complex language rules, and facilitated more coherent and polished writing. For instance, 85% of participants indicated that Grammarly's grammar and style suggestions led to more refined essays. However, the study also uncovered notable concerns regarding privacy and the potential for reduced self-reliance. Approximately 60% of students expressed worries about data security and the possibility of becoming overly dependent on these tools, which could impact their ability to write independently without technological assistance.

Interpreting Results:

The positive impact of AI tools on students' writing skills is consistent with previous research highlighting their effectiveness in enhancing language learning. Studies by Smith (2022) and Lee (2023) have shown that AI tools can significantly improve grammatical accuracy and writing coherence. Our findings extend this knowledge by illustrating students' specific perceptions and the nuanced effects of these tools. The benefits of AI tools, such as increased confidence and improved writing quality, align with the supportive findings of these studies. However, our results also reveal potential drawbacks, including privacy concerns and the risk of decreased independent writing skills, which are less emphasized in existing literature. This suggests a need for a balanced approach when integrating AI tools into educational practices, considering both their advantages and potential negative impacts.

Addressing Limitations:

Several limitations of this study must be acknowledged. The reliance on self-reported data introduces the risk of response bias, as students may provide socially desirable

answers rather than objective assessments. Additionally, the study's cross-sectional design limits the ability to assess the long-term impact of AI tool usage on writing skills and independent learning. The study did not differentiate between the effectiveness of individual AI tools, which may vary significantly. These limitations highlight the need for further research with longitudinal designs and objective performance measures to fully understand the long-term implications of AI tool usage on students' writing abilities and educational outcomes.

Implications for Future Research:

Future research should address these limitations by incorporating longitudinal studies to track the impact of AI tools over extended periods. Comparative studies evaluating the effectiveness of different AI tools could provide more detailed insights into which tools offer the greatest benefits and why. Additionally, research should explore strategies to mitigate privacy concerns and ensure data security when using AI tools. Investigating the impact of AI tools on students' ability to write independently and their overall learning experiences will be crucial for refining their integration into educational settings. By focusing on these areas, future research can contribute to more effective and secure use of AI tools, enhancing their benefits while addressing potential drawbacks.

CONCLUSION

This research delved into the impact of AI tools Quillbot, ChatGPT, and Grammarly on the writing assignments of EFL students, investigating their perceptions, benefits, and limitations. The core problem addressed was the need to evaluate how these tools affect students' writing skills, their learning experience, and their attitudes towards technology in an educational context. Understanding these aspects is crucial for integrating AI tools effectively into language learning environments.

Our study reveals that AI tools play a transformative role in EFL students' writing practices. Quillbot's paraphrasing capabilities, ChatGPT's context-aware feedback, and Grammarly's error detection were all highly valued by students. These tools significantly enhanced the quality of writing assignments by improving grammar, syntax, and overall coherence. Students reported increased confidence in their writing abilities and found the tools useful for understanding complex language rules and structures. This aligns with previous

research suggesting that such tools can serve as valuable aids in writing development and learning (Smith, 2022; Jones, 2023).

However, the study also identified notable limitations and concerns. Privacy issues were a significant concern, with students expressing unease about the potential misuse of their data. There was also a risk of over-reliance on these tools, which might undermine the development of independent writing skills. These findings are consistent with broader discussions on the challenges associated with educational technology (Brown & Lee, 2021; Miller, 2022). While AI tools offer substantial benefits, their integration into learning environments must be managed carefully to avoid potential pitfalls.

The key takeaways from this research are:

1. **Enhanced Writing Quality:** AI tools contribute positively to the quality of EFL students' writing, offering practical assistance in error correction and stylistic improvements.
2. **Increased Confidence:** The use of AI tools boosts students' confidence by providing instant feedback and helping them better understand language mechanics.
3. **Privacy and Dependency Concerns:** There is a pressing need to address privacy issues related to AI tools and to develop strategies to mitigate the risk of over-dependence.

For future research, it is essential to explore the long-term impacts of AI tool usage on students' writing skills and their academic development. Longitudinal studies could provide insights into how sustained use of AI tools influences writing proficiency over time. Additionally, comparative analyses of different AI tools could help identify best practices and refine their integration into educational settings. Exploring these areas will contribute to a more nuanced understanding of how AI tools can be leveraged effectively in language learning while addressing their limitations.

ACKNOWLEDGEMENTS

We want to express our heartfelt gratitude to everyone who supported and contributed to completing this research. Our deepest appreciation goes to our advisor, Ms. Lystiana Nurhayat Hakim, whose guidance, expertise, and unwavering encouragement have been invaluable

throughout this study. We are grateful for the insightful feedback and constructive criticism provided, which significantly enhanced the quality of this research.

We extend our sincere thanks to the faculty members of the English Education Department at Perjuangan University for their academic support and for providing a conducive environment for research. We are profoundly grateful to the English Education students from various universities across Indonesia who participated in our survey. Their valuable perceptions and responses were crucial for the success of this research on AI-powered tools for developing writing skills. Without their input, this study would not have been possible.

Our gratitude extends to our colleagues at Perjuangan University and friends for their moral support and encouragement, who offered valuable feedback and assistance in various stages of this project. This research was made possible by the collective efforts and support of many individuals and institutions, to whom we are deeply grateful.

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