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University Students' Perceptions of AI-Assisted Writing Tools in Supporting Self-Regulated Writing Practices

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ABSTRACT

Artificial intelligence (AI) is transforming education by offering personalized learning tools, yet its role in fostering self-regulated learning (SRL) strategies among English as a Foreign Language (EFL) students remains underexplored. This study investigates EFL students' perceptions of AI applications in supporting their self-regulated writing strategies, particularly in planning, monitoring, and evaluation. Employing a qualitative case study approach, data were collected from 40 EFL students at an Islamic-based university in East Java, Indonesia, through questionnaires, semi-structured interviews, and document analysis. The findings indicate that most students perceive AI tools as beneficial, particularly for grammar checking, spelling correction, and word choice improvement, though their reliance on AI for idea generation, topic selection, and writing progress monitoring varies. While AI is valued for feedback, paraphrasing, and translation, students still prefer human guidance for in-depth explanations, with some expressing concerns that excessive dependence on AI may hinder their comprehension and writing confidence. These findings highlight the need for a balanced integration of AI tools into writing instruction, emphasizing the importance of human feedback and personalized learning approaches.

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1. Introduction

The development of writing skills among English as Foreign Language (EFL) students has been a central concern in language education, as writing plays a crucial role in academic and professional success. Beyond its functional purpose, writing fosters intellectual development by integrating vocabulary, grammar, and discourse skills while also promoting critical thinking and self-reflection (Jamoom, 2021; Türkben, 2021). In addition, writing gives

students the ability to construct persuasive arguments, self-reflect, and exchange feedback, skills that are much needed in academic and professional contexts (Fodil-cherif, 2021). However, many EFL students struggle with writing due to challenges in organization, coherence, and linguistic accuracy, highlighting the need for effective learning strategies.

To develop writing skills, Self-Regulated Writing (SRW) is a powerful strategy rooted in the wider idea of Self-Regulated Learning (SRL) (Teng & Huang, 2019). SRW includes active planning, monitoring, and evaluation of writing activities on the part of students, which results in autonomy, critical thinking, and creativity (Teng & Huang, 2019; Zimmerman, 2000). Through cognitive, metacognitive, social, and motivational process regulation, students can improve their writing performance and overcome adversity (Skar et al., 2023; Teng & Zhang, 2016). Empirical evidence indicates students who employ SRW strategies perform better in writing, have greater self-efficacy, and experience better learning outcomes (Han et al., 2021; Teng & Zhang, 2020).

The integration of Artificial Intelligence (AI) has further transformed teaching writing by making it possible for students to receive instant feedback, idea generation, and enhanced writing facilities (Qiao & Zhao, 2023; Song & Song, 2023). AI-based tools, such as Grammarly, QuillBot, and ChatGPT, enhance learner-centric learning, in which learners themselves play an active role in learning using technology, and educators play a role of a facilitator. In this regard, Koraishi (2023) argue that AI tools such as ChatGPT make SRW easier by aiding in the process of writing ranging from planning, composing, editing, and revising, which ultimately results in enhanced learner autonomy and improved writing skills.

However, the practical use of AI tools often falls short of this expectation. Students have been shown to heavily rely on AI for superficial functions such as grammar checking, spelling correction, and paraphrasing, and not for more substantial and challenging learning exercises (Le, 2023; Ranalli, 2021). Such overreliance on AI for a quick solution may ultimately reduce critical thinking and creativity, as students neglect the reflective and iterative process of writing. Besides, AI tools may provide too abstract feedback, failing to capture the specific context of individual writing tasks (Darwin et al., 2024). For example, a popular AI-powered writing tool, Grammarly, has been found to provide too abstract suggestions which may not necessarily agree with a writer's intent (Ummah & Bisriyah, 2022). This highlights the need for a balanced approach, where AI tools support active learning and self-regulation, and not replace them.

While there has been extensive research done on technology use in SRL (Jin et al., 2023; Tran & Ma, 2023), there have been scant research focus on learners' perception of using Artificial Intelligence (AI) in self-regulated writing (SRW). Research has indicated that technology-supported self-regulation improves writing performance through the facilitation of plan formation and self-monitoring (Tran & Ma, 2023), and AI can help with metacognitive, cognitive, and action regulation in learning (Jin et al., 2023). However, there are concerns over the use of AI tools to engage students in deeper exploration of SRW strategies (Han et al., 2021; Qiao & Zhao, 2023; Song & Song, 2023; Teng & Zhang, 2020).

While the use of AI to teach writing has become increasingly popular, there has been sparse research regarding how the tools are employed by EFL learners and how they view SRW. Ensuring that AI assists learners' self-regulation rather than compromising it requires an understanding of these perceptions. Addressing this gap, the present study investigates EFL

students' perceptions of AI in SRW, focusing on its role in fostering learner autonomy, writing proficiency, and critical thinking.

2. Literature Review

2.1 Self-Regulated Writing

Students who engage in self-regulated writing (SRW), an intentional learning process, take charge of their own writing progress. Students can set their own writing goals, track their progress, and evaluate their work on their own with SRW, as opposed to teacher-controlled writing, where the teacher controls the process (Zimmerman, 2000; Zimmerman & Schunk, 2011). Although SRW has the potential to be a successful teaching strategy, different students have different levels of success with it. This variation emphasizes the necessity of analyzing the factors that facilitate or hinder its effective implementation.

The process of writing is multifaceted and includes several steps, including planning, drafting, revising, and editing. Each step requires students to apply cognitive, metacognitive, and emotional regulation strategies (Rosário et al., 2019). However, previous research has often treated SRW as a collection of separate strategies rather than as an integrated process shaped by teaching practices, feedback mechanisms, and student motivation.

A well-established SRW model identifies four key dimensions that influence self-directed writing: cognitive, metacognitive, social-behavioral, and motivational regulation (Teng & Zhang, 2016). Table 1 summarizes these dimensions and corresponding strategies:

Table 1: Nine Writing Strategies of Four SRW Dimensions

SRW Dimension	Writing Strategy	Description
Cognitive	Text Processing (TP)	Using linguistic and discourse knowledge to produce written texts.
	Course Memory (CM)	Actively recalling writing knowledge from respective subjects.
Metacognitive	Idea Planning (IP)	Generating ideas before writing.
	Goal-oriented, Monitoring and Evaluation (GME)	Monitoring activities to achieve predetermined goals.
Social-Behavioral	Feedback Handling (FH)	Responding to teacher and peer feedback.
	Peer Learning (PL)	Seeking help from peers, contributing to the learning process.
Motivational Regulation	Motivational Self-Talk (MST)	Involves self-encouragement in knowledge mastery and academic performance.
	Interest Enhancement (IH)	The tendency to make learning more enjoyable.
	Emotional Control (EC)	Measuring efforts to manage emotions during writing tasks.

These strategies provide an organized method for SRW, but the extent to which they work relies on the skills of the students, the learning environment, and the availability of resources. Studies by Altas and Mede (2021), Fathi and Feizollahi (2020) and Han et al. (2021) suggests that higher-quality writing is typically produced by students who actively use SRW strategies.

However, these studies primarily examine correlations, which leave gaps in understanding the specific mechanisms through which SRW strategies contribute to improved writing performance.

2.2 AI-Assisted Writing

AI writing tools are becoming increasingly popular within the learning environment because they are capable of giving feedback on grammar, vocabulary, organization, and coherence in real-time (Song & Song, 2023). Such tools like Grammarly, ProWritingAid, and AI-powered writing assistants like ChatGPT claim to enhance writing quality. However, despite their increasing popularity, there are concerns about their actual impact on learners' ability to write independently.

Research on Automated Writing Evaluations (AWE) tools such as Criterion and MY Access!, suggests AI can assist learners by providing automated feedback (Guo et al., 2022; Koltovskaia, 2020). AI translation and generation of text technologies such as Google Translate and GPT-3 are also observed able to enhance language fluency and accuracy. However, its potential for in-depth learning and critical thinking in writing is controversial. Research conducted by Chen (2023) and Salvagno et al. (2023) supports the ability of AI to detect errors and simplify the usage of words. However, other researchers advise that over-reliance upon AI-provided recommendations will lower the participation of learners during the writing process.

Among the AI tools, Quillbot has been recognized for its paraphrasing capabilities that help students to summarize and reorganize text without losing meaning (Dale, 2020; Kusuma, 2020). Kurniati and Fithriani (2022) state that Quillbot enhances writing fluency but raises some concern about encouraging passive learning behavior. Accordingly, ChatGPT provides interactive feedback on content and organization, with studies such as that by Mahapatra (2024) showing the positive contribution to the writing ability of ESL learners. However, how such tools contribute to actual writing development rather than merely refining content remains questionable.

Grammarly and ProWritingAid are grammar and style checkers that help learners revise and detect errors (Armanda et al., 2022; Fitria, 2023). Even though the tools correct feedback in real-time, findings from Mammadova (2019) and Nasution and Fatimah (2018) indicate that the use of AI to support learners can result in the inability to internalize grammar rules. Besides, ProWritingAid provides valuable insights into coherence and clarity, whose usefulness is dependent on students' ability to interpret and apply the recommendations (Wahyuda et al., 2022).

While there is promise in utilizing AI-assisted writing technology, its drawback must be carefully weighed. Darwin et al. (2024) highlight the challenges of integrating AI into writing instruction, particularly for new educators who struggle in its integration. Jiang (2022) raises concerns about AI's tendency for standardization of writing, which can repress students' creativity and critical thinking in language usage. Accordingly, though technology can help in writing, it must be utilized as an adjunct, rather than a substitute, for traditional teaching of writing. Future research must address ways in which AI-assisted technology can be integrated with strategies of self-regulated learning in an attempt to increase students' autonomy and writing ability.

3. Research Methodology

3.1 Research Design

Qualitative case study is being employed in this study in order to find students' perspectives on utilizing AI in supporting SRW practices. Qualitative study is ideal for this study as it enables a thorough study of students' experiences, motivations, and challenges in employing AI tools in writing (Creswell, 2015; Fitrah & Luthfiyah, 2017). Different from quantitative study, which is number-oriented, qualitative study deals with human behavior in its actual setting, making it ideal in studying students' regulation of writing using AI support.

Case study was employed because it offers situation-specific analysis of AI use in writing that provides rich qualitative understanding of the view of the students within a specific learning situation (Yin, 2013). The case was limited to the last semester EFL students because they are writing a thesis—a process that demands advanced cognitive, metacognitive, and motivational self-regulation (Hapsari & Fatmasari, 2022). Limiting the case study to specific students will produce rich and meaningful information that portrays heterogeneity in the use of AI-powered writing tools.

3.2 Participants

The participants of this study were the last-year EFL students from the English Education Department, whom the researchers chose using a purposive sampling. This is a participant selection method that possesses experiential knowledge about SRW strategies and AI writing assistance, and therefore making them natural informants to this research (Abadikhah et al., 2018; Umamah & Cahyono, 2020). The selection of the students was made based on the assumption that writing a thesis requires an enormous amount of self-regulation, and therefore making it a suitable case to investigate SRW and AI use.

Sample was determined using the saturation principle where the collection of data was ongoing until new themes did not emerge (Guest et al., 2006). The heterogeneity of the experiences was ensured through the classification of the students based on AI dependency using the use of the questionnaires. The six participants recruited to participate in the semi-structured interviews represented two from each low, moderate, and high AI dependency. This is a comparison purposes sampling strategy that provides an extensive understanding of the difference in AI usage among the students with different SRW behaviors.

3.3 Instruments

Three primary instruments used in this research; a questionnaire, an interview, and documentation. The questionnaire was adapted from Teng and Zhang (2016) which captured students' usage of AI tools and self-regulated writing strategies. The 17 items from the initial version were piloted for the sake of content validity by two writing instruction and educational technology experts. The pilot test was done using 23 students to assess reliability, validity, and clarity. One item was removed using SPSS analysis based on low loading. This left the 16-item questionnaire that exhibited strong internal consistency of 0.888. This reliability coefficient indicates that this tool provides consistent and similar results (Flick, 2018).

The second instrument was an interview. Semi-structured interviews were conducted to gain deeper insights into students' experiences with AI-assisted writing. The interview protocol

was adapted from Han et al. (2021) and consisted of nine open-ended questions, designed to explore students' perceptions of AI's usability, benefits, and limitations in supporting SRW. The semi-structured format provided flexibility, allowing participants to elaborate on their experiences while ensuring comparability across responses (Cohen et al., 2018). Each of these interviews lasted for about 30 minutes, was recorded, and later transcribed verbatim for data analysis.

The last one was documentation. As an extra measure to ensure triangulation and the validity of the findings, documentation through the screenshot evidence of the use of the AI writing tools was taken. The visual evidence corroborated the evidence gained through the use of the questionnaires and the interviews to provide real-life examples of the use of the AI tools by the learners (Flick, 2018).

3.4 Data Analysis Procedures

Data were analyzed using a systematic procedure that integrates both quantitative and qualitative methods to enhance the robustness of findings.

1. Questionnaire Analysis
   Data gathered in questionnaires were analyzed using a 6-point Likert scale, which included an "I have no idea" option for unfamiliarity with AI tools. Scoring varied between 0 (I have no idea) and 5 (Strongly agree). Participants' scores were calculated using the following formula (Purwanto, 2000):

   $$P = (\text{total score} / \text{maximum score}) \times 100\%$$

   Where P represents the percentage score for each individual, and the maximum score is 80 (5 points × 16 items). The percentages were interpreted according to Sugiyono (2017) as follows:

Percentage	Category
0% - 25%	Very Low
26% - 50%	Low
51% - 75%	High
76% - 100%	Very High

   From these, six students were selected for further interviews, which secured a representative set of students in relation to different levels of dependency on AI.
2. Interview Analysis
   The data gathered in the interviews were coded based on Miles and Huberman (1994) model, consisting of four stages:
   - Transcription: Audio recordings were transcribed verbatim to ensure accuracy.
   - Data Reduction: The irrelevant data and redundancy have been removed, and themes have been coded and identified.
   - Data Display: The data organized in a tabulated format for easier interpretation.
   - Conclusion Drawing: The emerging patterns were combined, and there were several rounds of coding in order to achieve consistency and accuracy of interpretation.
3. Triangulation and Validation
   To enhance the credibility of the study, methodological triangulation was employed in comparing results of questionnaires, interviews, and documentation. Member checking was also employed in presenting results in a preliminary form in an attempt to validate

interpretation of results (Lincoln & Guba, 1985). The credibility of qualitative results was enhanced using peer debriefing, wherein another researcher reviewed the process of thematic and coding analysis.

4. Results

4.1. Questionnaire Findings

This finding reveals that the majority of students (95%) perceive AI tools as highly beneficial for self-regulated writing strategies, placing them in the "High" and "Very High" usage groups. This indicates a generally positive perception of AI's role in writing support. However, a small minority (5%) reported "Low" AI usage, suggesting that further investigation is needed to understand the factors influencing their lower perceived reliance on AI tools. To better understand the role of AI in self-regulated writing, the following sections analyze findings across four dimensions: cognitive, metacognitive, social behavior, and motivational regulation. This analysis identifies key areas where AI is most beneficial and highlights aspects where students' exhibit varied perceptions.

1) Cognitive Dimension

The cognitive dimension assesses AI's role in text processing and course memory. The findings indicate strong agreement among students regarding AI's utility in grammar checking (82.5%), word choice improvement (80%), and spelling correction (62.5%). However, lower agreement was observed in AI's support for ensuring topic clarity (62.5%) and recalling course materials (40%).

Table 3: Cognitive Dimension of SRW Questionnaire

NO	Questionnaire items	IHNI	SDA	DA	N	A	SA	TOTAL
	TEXT PROCESSING							
1.	When writing, I use AI to check my grammar mistakes.	0%	2,5%	7,5%	7,5%	47,5%	35%	100%
2.	When writing, I use AI to check spelling and punctuation errors	0%	2,5%	10%	25%	40%	22,5%	100%
3.	When writing, I use AI to check the cohesiveness and logical structure of my sentences and paragraphs.	0%	2,5%	10%	30%	47,5%	10%	100%
4.	When writing, I use AI to improve my word choice.	0%	0%	7,5%	12,5%	57,5%	22,5%	100%
5.	When writing, I use AI to check whether the topic and the content have been clearly expressed.	5%	0%	15%	17,5%	42,5%	20%	100%
	COURSE MEMORY							
1.	I use AI to provide materials from previous writing courses.	2,5%	2,5%	12,5%	42,5%	35%	5%	100%

The findings related to the cognitive dimensions of self-regulated writing identified that students primarily used AI for tasks such as grammar and spelling checks and improving word choice, with high agreement observed in these areas. This suggests that AI technology is an imperative element in supporting students in learning language accuracy and mechanics. The lower agreements in using AI for selecting themes and accessing prior material, however, may suggest that students make little use of AI for these functions or have other preferred

methods of doing so. Overall, the results show that AI is useful in helping students with their writing, especially in content processing and fixing errors.

2) Metacognitive Dimension

This dimension evaluates AI's role in idea planning and goal-oriented monitoring. While AI is moderately used for idea generation (47.5%) and information retrieval (62.5%), students show mixed responses regarding its effectiveness in monitoring writing progress (60%).

Table 4: Metacognitive Dimension of SRW Questionnaire

NO	Questionnaire items	IHNI	SDA	DA	N	A	SA	TOTAL
	IDEA PLANNING							
1.	Before writing, I use AI to generate ideas.	0%	7,5%	22,5%	22,5%	40%	7,5%	100%
2.	Before writing, I use AI to search for relevant information to support my topic	0%	2,5%	17,5%	17,5%	45%	17,5%	100%
	GOAL-ORIENTED MONITORING							
1.	I use AI to monitor my writing progress and ensure I achieve my goals.	0%	2,5%	12,5%	25%	47,5%	12,5%	100%

The findings of the metacognitive dimension show mixed views on the role of AI in planning ideas and monitoring writing progress. While AI can be helpful in generating ideas and finding relevant information, not all students fully utilize it for this purpose. Some students preferred traditional methods of generating ideas, while others found AI useful in exploring topics and developing their ideas. Similarly, AI can help monitor writing progress, but not all students rely on it for this purpose. These diverse perceptions suggest that AI tools can support metacognitive strategies, but their use may vary depending on individual preferences and needs.

3) Social Behavior Dimension

This dimension examines feedback handling and peer learning. Most students welcome AI feedback (67.5%) and use it to refine their writing (75%). However, the highest agreement (97.5%) is observed in students' preference for combining AI with teacher and peer feedback. Peer discussions after AI use are also common (77.5%).

Table 5: Social Behavior Dimension of SRW Questionnaire

NO	Questionnaire items	IHNI	SDA	DA	N	A	SA	TOTAL
	FEEDBACK HANDLING							
1.	I am open to AI feedback on my writing for an in-depth analysis of my writing style.	2,5%	2,5%	2,5%	25%	52,5%	15%	100%
2.	I try to improve my English writing based on AI feedback.	0%	0%	7,5%	17,5%	55%	20%	100%
3.	I try to improve my English writing not only based on AI, but also based on my teacher's and peer's feedback.	0%	0%	0%	2,5%	45%	52,5%	100%
	PEER LEARNING							
1.	I discuss with my peers after using AI to have more ideas to write.	2,5%	0%	2,5%	17,5%	42,5%	35%	100%

The findings related to the social behavior dimension highlight the importance of AI and human feedback in EFL students' writing. Although students value AI feedback for its efficiency and convenience, they also recognize the importance of feedback from teachers and peers for in-depth analysis and personalized guidance. This suggests that AI tools can complement, but not replace, human interaction in the feedback process. Moreover, the findings show that students actively engage in peer learning after using AI, which further emphasizes the importance of collaboration and social interaction in the development of their writing.

4) Motivational Regulation Dimension

This dimension covers motivational self-talk, interest enhancement, and emotional control.

Table 6: Motivational Regulation Dimension of SRW Questionnaire

NO	Questionnaire items	IHNI	SDA	DA	N	A	SA	TOTAL
	MOTIVATIONAL SELF-TALK							
1.	I am committed to using AI applications as part of my strategy to improve my writing competence.	0%	0%	7,5%	17,5%	57,5%	17,5%	100%
	INTEREST ENHANCEMENT							
2.	I choose interesting topics with the help of AI.	0%	0%	17,5%	32,5%	35%	15%	100%
	EMOTIONAL CONTROL							
3.	I feel confident in presenting my writing, especially when supported by AI tools.	0%	0%	7,5%	32,5%	42,5%	17,5%	100%

The results suggest that AI tools can positively contribute to students' motivation and confidence in writing. The use of AI can make students more committed to improve their writing skills and increase their confidence in presenting their writing. However, the results indicate that AI has a smaller role in helping students choose interesting topics since they may prefer traditional methods or personal interests for this. In short, it suggests that AI tools can contribute in motivation regulation in EFL writing by supporting, commenting, and giving a sense of accomplishment, which eventually makes students take responsibility for improving themselves.

4.2. Interview Results

The interview findings reveal varied attitudes towards AI usage and its role in supporting students' self-regulated writing (SRW) strategies. These findings have been categorized based on the primary functions of AI tools: grammar and spelling correction, paraphrasing, translation, and idea generation. The results also highlight students' preferences and how they optimize AI-assisted writing to enhance their self-regulated learning (SRL) and writing processes.

1) Grammar and Spelling Correction

Students widely acknowledged the usefulness of AI tools like Grammarly for improving grammar and spelling. Many participants emphasized the confidence boost provided by these tools, as they ensured error-free writing and reduced anxiety about grammatical mistakes.

"My grammar is quite weak, so I need Grammarly to fix the grammar error in my thesis." (I1)
"Grammarly helps me check my grammar and reduces my workload since I haven't fully mastered grammar yet." (I5)
"In my experience, Grammarly has been quite effective so far, and one of the reasons I prefer it is because of its ease of use. I remember downloading and linking it to Word easily." (I6)

However, some students expressed concerns about over-reliance on AI for grammar checking, preferring human feedback for more detailed explanations.

"I'm the type of person who needs direct explanations, so I prefer to ask my supervisor or a friend who really understands the field." (I1)
" Expert feedback not only helps me determine whether I'm right or wrong, but also teach me the reasons behind it and how to fix it." (I2)

2) Paraphrasing

QuillBot was a preferred tool for paraphrasing, particularly for rewording sentences without changing their meaning. Many students appreciated how the tool helped expand their vocabulary and improve sentence structure.

"When paraphrasing in QuillBot, words are replaced with synonyms, and from that, I can learn new vocabulary." (I5)
"For the grammar itself, I usually also use the QuillBot. Besides the paraphrasing feature, there's also a grammar checker feature, and it's more or less like Grammarly." (I3)

On the other hand, some participants noted that paraphrasing tools occasionally distorted the original meaning of their sentences, requiring manual adjustments.

"Sometimes the paraphraser in QuillBot changes the sentence too much from what I meant." (I2)

3) Translation

DeepL was frequently used for translation, with students finding it more accurate than other tools, particularly for academic writing.

"I use DeepL not only for translation but also to check my English writing." (I1)
"DeepL is more accurate and more suitable for academic writing than Google Translate." (I2)

Despite its accuracy, some students noted that AI translation tools occasionally misunderstood context, requiring further manual revision.

"For example, we want to use the present tense, but the AI changes it to the past tense, so we have to manually correct it." (I4)
"We wanted to translate something in a certain context, but AI translated it differently from what we intended." (I3)

4) Idea Generation and Writing Development

Some students used AI tools such as Gemini and ChatGPT for idea generation, topic exploration, and reference sourcing. They found these tools beneficial for expanding their writing scope and developing structured arguments.

"Gemini can perform various tasks based on our instructions. It's not limited to writing, whatever we ask for, Gemini can provide." (I6)

"I use ChatGPT to find themes or topics for my writing." (I3)
"I use ChatGPT to expand my ideas and discover new ones." (I5)

However, some students preferred traditional methods, such as reading books and academic journals, for generating ideas.

"For ideas, I usually search on Google or read books, journals, and so on." (I4)
" Since my thesis is qualitative, I focus on field data rather than relying on information from ChatGPT." (I3)

5) AI-Assisted Writing and Self-Regulated Writing (SRW)

The interviews revealed that students' AI usage varied depending on their writing habits and levels of self-regulation. While some students integrated AI into their daily writing routines, others used it only when necessary.

"I use AI very often, every day, since I work on my thesis daily." (I5)
" I don't use Grammarly much, I just use translation tools. As for AI like ChatGPT, I use it very rarely, almost never." (I1)
"I don't use AI frequently." (I2)

Many students used AI to track their writing progress, with Grammarly's scoring system being particularly valued for self-assessment.

"I trust Grammarly to assess my writing because it provides a score and shows my mistakes." (I4)
" AI helps me identify my mistakes, and when it shows fewer errors, I know my writing is improving." (I5)

Nevertheless, some students remained skeptical about AI's reliability and preferred to rely on their own skills.

"I don't really trust the app. I already trust my own ability to check grammar." (I2)
"I'm worried that I won't understand my own writing if I rely too much on AI." (I1)
"I don't feel confident using AI because I'm afraid that if someone ask about it, I won't be able to explain it." (I5)

5. Discussion

The findings of this study reveal that students exhibit both positive and negative attitudes toward AI tools in writing, largely influenced by their level of familiarity and frequency of use. AI is viewed by frequent users as an invaluable tool for writing, while occasional users have concerns about precision, trustworthiness, and dependency. Students find AI useful in various strategies of self-regulated writing strategies, including grammar, paraphrasing, and idea generation. Although its usefulness is immense, AI is not a perfect replacement for human input, as students continue to prefer input from other students and instructors for major revisions (Armanda et al., 2022; Teng, 2024).

Variation in perception can be explained by levels of exposure of students to AI and levels of writing confidence. Students who have frequent exposure to AI tools identify its usefulness in grammar improvements and paraphrasing, which provides them with enhanced writing confidence (Nguyen et al., 2024; Song & Song, 2023). Conversely, inexperienced students question its reliability due to frequent errors in contexts (Ummah & Bisriyah, 2022) and

inadequate paraphrasing (Alammar & Amin, 2023). The issue of access, such as relying on premium versions and online connections, is a barrier for students in utilizing AI tools (Fitriana & Nurazni, 2022; Kamalov & Gurrib, 2023).

These findings suggest that AI tools are being utilized as complementary support systems rather than human feedback substitutions. Although AI is effective in refining aspects of writing technically, it is incapable of producing in-depth analytical feedbacks, which leads students to seek further support from educators and other students (Ahmed, 2023; Teng, 2024). The preference for human interaction also aligns with theories of self-regulated learning (Zimmerman, 2000), which emphasize the importance of metacognition and feedback interpretation in improving writing skills. Moreover, AI fosters confidence in writing but may also lead to over-reliance, which can hinder the development of independent writing skills (Barrot, 2023; Darwin et al., 2024).

This study's findings align with previous research that highlights AI's role in facilitating grammar and spelling corrections (Armanda et al., 2022; Le, 2023). Similar to Song and Song (2023) and Utami et al. (2023), this study confirms that AI supports idea generation, particularly in the early stages of writing. However, the findings challenge prior research that suggests AI-generated feedback is sufficient for writing improvement (Alammar & Amin, 2023; Ansorge et al., 2021), as many students in this study still prefer human feedback for complex revisions. This study also extends the work of Yadav and Yadav (2024) by demonstrating how AI fosters hybrid intelligence, combining automated assistance with human expertise.

This study contributes to the understanding of AI-assisted self-regulated writing by explaining AI's role in student learning. Given AI's ability to support writing development, future research should examine how AI tools can be designed to provide more contextually aware feedback while incorporating metacognitive strategies to enhance students' decision-making in writing (Nguyen et al., 2024; Tran & Ma, 2023). To maximize AI's potential, universities should integrate AI training into writing courses, ensuring that students develop not only technical proficiency but also critical thinking skills when engaging with AI-generated feedback. Furthermore, educators can help learners balance AI suggestions and human feedbacks, creating a well-structured process for greater efficiency and depth in writing development (Ghafouri et al., 2024; Teng, 2024). Besides, addressing concerns of accessibility, such as institution subscriptions for AI tools, can help bridge the gap for learners who struggle accessing premium features, making technology in writing education accessible for all on an equal platform (Fitriana & Nurazni, 2022; Kamalov & Gurrib, 2023).

6. Conclusion

The current study examines EFL students' perceptions of utilizing AI technologies in supporting self-regulated writing practices. Students in questionnaires and interviews have been shown to have a positive attitude toward utilizing AI, particularly for grammar and spelling checks, paraphrasing, translation, and idea generation. However, there are concerns related to limited contextual accuracy and lack of in-depth feedback.

Despite these shortcomings, this study confirms that AI tools facilitate all nine of self-regulated writing strategies in all stages of writing. Grammarly facilitates grammar refining and structural accuracy, while ChatGPT facilitates memory recall by reminding learners of

prior learning. QuillBot and ChatGPT facilitate idea planning and organization, and goal-oriented writing is facilitated by Grammarly, which facilitates tracking of progress. AI tools also support peer learning by allowing learners to refine their drafts before sharing them for review.

To assist EFL writing pedagogy, using AI technology in teaching materials can promote learners' cognitive and metacognitive strategies, enabling them to plan, monitor, and evaluate writing more effectively. AI can play a supporting role in solving language issues, so teaching can focus on content generation and higher-order thinking. This study is, however, limited in its scope of a selected group of learners and its selection of AI tools. Future studies have to take account of AI in different levels of language proficiency, forms of writing, and learning contexts. Further studies are needed to improve AI-generate feedback so that it aligns with learners' writing needs, promotes critical thinking, and supports learner autonomy. Educators, learners, and AI developers have to collaborate in maximizing AI contribution in teaching writing and developing more adaptive, situation-specific writing support systems.

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