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https://doi.org/10.52696/AGBC2453
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Indonesian EFL Students' Perception of the Use of Artificial Intelligence Applications to Support Self-Regulated Learning in Academic Reading and Writing

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ABSTRACT

Although a few studies have examined self-regulated learning using technology for academic reading and writing, research on students' perceptions of using artificial intelligence (AI) applications to support self-regulated learning in academic writing within Indonesia's higher education context remains underexplored. This study aims to investigate the perceptions of EFL undergraduate students regarding the use of AI applications to support self-regulated learning in academic reading and writing coursework. Four students enrolling in academic reading and writing coursework agreed to participate in this interview study. A descriptive qualitative approach with thematic analysis was employed as the research method. The findings revealed that AI applications were perceived as beneficial in supporting students' self-regulated learning for academic reading and writing in the forethought, performance, and reflection phases. This research gives empirical contributions on how AI applications can support students' self-regulated learning in academic reading and writing coursework. However, this study is limited to a single classroom of academic reading and writing coursework, with a small number of participants. Future research may involve more participants and a broader scope of the study to enrich the discussion on the use of AI applications in academic reading and writing coursework.

KEYWORDS: Academic Reading, Academic Writing, Artificial Intelligence, Self-regulated Learning

INTRODUCTION

The use of artificial intelligence (AI) applications in education has been widely discussed since 2019, when generative pre-trained transformers (GPT) language models, developed by OpenAI, began to generate coherent texts (Vincent, 2019; Russell & Norvig, 2021). The rise in the use of AI applications in English language teaching and learning (ELT/L) is closely tied to the status of the English language as one of the most widely used languages for communication in international discourse and markets. Almehmadi (2024) conducts a systematic review regarding how to incorporate AI into EFL instruction. Two hundred eighty-four publications published from 2019 to 2023 were initially selected from prominent databases (ERIC, ScienceDirect, JSTOR, ProQuest, and Scopus). Thirteen papers were chosen for the final review based on predetermined inclusion and exclusion criteria. The findings highlight the advantages of integrating AI applications (such as chatbots, automated writing evaluation, and writing aid technologies) in teaching essential EFL skills: speaking, listening, and writing. Almehmadi (2024) suggests that although AI has considerable potential in EFL lessons, its effectiveness is multifaceted. A meticulous evaluation is required to evaluate its implementation in language education. Considering this condition, undergraduate students need to develop an awareness of AI applications that can support their self-regulated learning, particularly in academic contexts involving reading and writing.

Artificial intelligence (AI) applications in assisting self-regulated learning (SRL) and English as a foreign language (EFL) have recently garnered significant attention. In online learning environments, artificial intelligence systems have shown promise in aiding AI applications are designed to support the cognitive, metacognitive, and motivational aspects of self-regulated learning, thereby enhancing students' learning experiences (Jin, Im, Yoo, Roll, & Seo, 2023) as well as in supporting students in each SRL phase (Chiu, 2024), enhances learners' engagement and diminishes academic procrastination (Ma & Chen, 2024). AI applications can potentially support students' self-regulated learning process in teaching English as a Foreign Language (EFL). Within the context of Indonesian English as a Foreign Language (EFL) education, AI applications such as ChatGPT, Grammarly, and Quilbot have been widely explored for the potential to enhance academic reading and writing (Dja'far & Hamidah,2024; Khonirin & Roslaini, 2024; Nuraeni, Febriani, & Rustandi, 2024; Sumakul, 2022; Zulfa et al., 2023).

Although there have been a few studies on using AI to support students' self-regulated learning (Chiu, 2024; Wong & Viberg, 2024; Jin et. al, 2023), the research on EFL undergraduate students' perception of the use of AI applications to support self-regulated learning in academic reading and writing, especially in Indonesia's higher education context is still underxplored (Dja'far & Hamidah, 2024; Khonirin & Roslaini, 2024; Nuraeni, Febriani, & Rustandi, 2024, Sumakul, 2022; Zulfa et al., 2023). To this end, this study asks the following question: How do students perceive the use of AI applications in supporting their self-regulated learning in academic reading and writing coursework? This study aims to describe how students perceive AI applications as supporting their self-regulated learning in academic reading and writing coursework.

LITERATURE REVIEW

The use of AI in EFL Academic Reading and Writing

In the EFL context, AI tools can support students' self-regulated learning in academic reading and writing. Although concerns about overreliance were noted, Saudi undergraduate EFL students also demonstrated positive attitudes towards artificial intelligence applications, recognizing its potential to enhance several language skills (Alqaed, 2024). Emphasizing the need for ethical use and appropriate training, EFL faculty members at Majmaah University stated that AI tools would help increase efficiency and quality in research writing processes (Mudawy, 2024). Wong & Viberg (2024) demonstrated in their two work-in-progress empirical studies that generative AI chatbots enhance the learning performance of higher education students in reading and writing, as well as their self-regulated learning, when utilized as a peer-feedback tool and study aid. Zhang & Umeanowai (2024), in their bibliometric analysis of 3,300 documents from the Web of Science (WoS) database, reveal a positive trend in AI integration within the domain of English as a Foreign Language. Five clusters of trends are identified: AI-enhanced language learning, educational technology, EFL teaching factors, learners' motivation, and assessment strategies. These studies, taken together, demonstrate the growing acceptance and potential applications of artificial intelligence in EFL education and research writing; however, both educators and learners should share the responsibility to ensure that Gen AI tools-mediated activities adhere to academic and pedagogical integrity.

Self-regulated learning strategies in the learning process

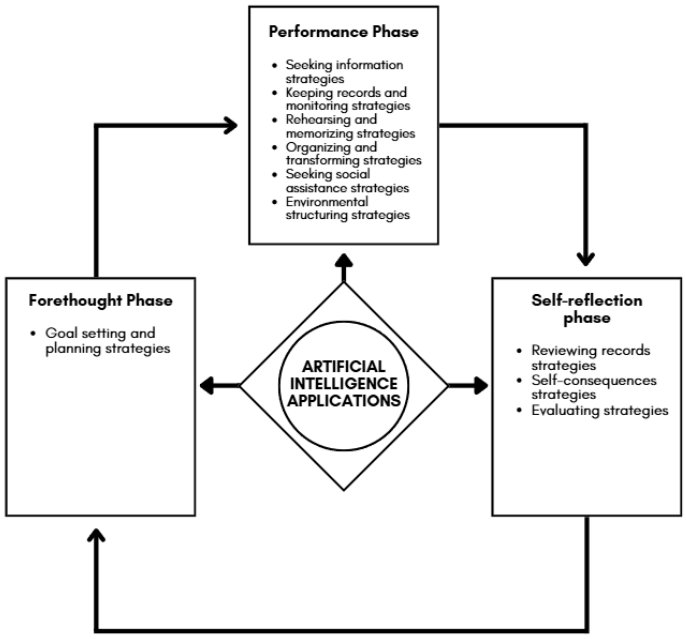
Zimmerman (2002) highlights that self-regulation is a self-directed process. In this process, learners transfer their mental abilities into academic skills. Zimmerman & Moylan (2009) elaborate, "self-generated thoughts, feelings, and actions for attaining one's learning goals" are involved in self-regulated learning. Zimmerman & Pons (1986) defined self-regulated learning strategies as actions directed at acquiring information or skills that involve agency, purpose (or goals), and the learner's self-perceptions of instrumentality. Zimmerman (2000a, 2002) develops a three-phase cyclical model that divides self-regulated learning into forethought, performance, and reflection phases in which self-regulated learning strategies, as classified by Zimmerman & Pons (1986), can be implemented. Zimmerman (2000a) elaborated that in the forethought phase, two categories of self-regulation are closely related: task analysis and self-motivation belief, which can be operationally defined as goal setting and planning strategies.

Meanwhile, in the performance task, Zimmerman (2000a) highlighted the notion of self-control, which encompasses processes such as attention, focusing, imagery, self-instruction, and task strategies, as well as self-observation, which focuses on specific processes and proximal events. Strategies that can be used in the performance phase, which support self-control, can include seeking information strategies, keeping records and monitoring strategies, rehearsing and memorizing strategies, and organizing and transforming strategies. Meanwhile, seeking social assistance strategies and environmental structuring strategies can support self-observation.

Finally, in the self-reflection phase, Zimmerman (2000a) argued that there were four criteria that can be used for self-evaluation: mastery, previous performance, normative, and collaborative criteria. Self-regulated learning strategies that can be used to support this phase, , according to Zimmerman & Pons (1986)' types of self-regulated learning strategies are: reviewing records strategies for recalling previous performance towards mastery, self-consequences strategies to anticipate normative criteria, and self-evaluation strategies for collaborative criteria. In this research, three phases and strategies as proposed by Zimmerman (2000a), were used to develop a conceptual framework for framing the participants' experiences in using Generative AI applications. The three phases are described as a triadic cyclical phase that a language learner experiences during their learning process in academic reading and writing coursework, which was supported by the use of Generative AI applications.

Figure 1

Conceptual framework: Phases and strategies of self-regulation supported by the use of AI applications



METHODOLOGY

Research Design

A descriptive qualitative study was employed to describe the students' views on using AI applications to support their self-regulated learning in academic reading and writing coursework. Nassaji (2015) argues that the goal of descriptive research is to describe a phenomenon and uncover its complexity to have a better and in-depth understanding of learners' behaviours and experiences in dealing with the phenomenon. In this research context, the phenomenon that was described was the use of Generative AI tools to support students' self-regulated learning in academic reading and writing coursework. The data type is primarily qualitative, based on the interview transcripts.

Participants

A qualitative approach with purposefully and homogeneously recruited participants was implemented. As Patton (2002) argued, minimum (homogeneous) sampling could be useful for gathering in-depth information about a particular subgroup in data collection for qualitative research. In this research, four students agreed to participate in this study. This specific group was female undergraduate students who demonstrated good classroom participation and achieved high scores at the end of the coursework. Participants were contacted via WhatsApp and scheduled for a group discussion interview, which was conducted through Zoom. Additionally, ethical approval was obtained from the participants through a written consent form. The participants were then given pseudonyms — Aisyah, Shelby, Carat, and Lisa — to protect their identities.

Materials

The first author utilizes authentic materials from website articles, online academic journal articles, and AI applications. The assessment framework requires students to submit three assignments to pass two modules: Foundations of Academic Reading and Writing, and Acknowledging the Use of AI in Academic Reading and Writing (rewriting the debate, drafting a literature review, and outlining research). The material on metacognitive awareness in using AI (self-regulation) is developed from three articles and presented in the second module after the mid-semester break. Table 1 describes the materials produced by the first and second authors for use with AI applications in academic reading and writing coursework.

Table 1

The EFL academic reading and writing materials

No	Title	Activities	Hyperlinks
A. Foundations of Academic Reading and Writing			
1	Academic reading and writing introduction	Discussing the course outline and introducing several academic journals for academic reading	ARW meeting 1 Journal of English and Education (JEE)
2	Academic collocation and phrase bank	Elaborating strategies in reading literature and practicing reviewing literature	Academic Collocation List (ACL) and Being Cautious Academic Phrasebank
3-5	Strategies in Reading Literature	Practicing summarizing and critiquing previous research	ARW meeting 3-5
6	Summarizing and critiquing previous research	Practicing summarizing and critiquing previous research	ARW meeting 6
7-9	Avoiding plagiarism: Direct Quotation, Summary, and Paraphrasing	Practicing writing direct quotations, summaries, and paraphrasing	ARW meeting 7-9
10-11	Reference Manager Guide	Managing references and citations	https://www.mendeley.com/search/

12	Summary in academic writing	Reviewing techniques in academic writing	ARW meeting 12
13	Paraphrasing in academic writing	Writing paraphrase	ARW meeting 13
14	Reviewing strategies for reading literature review and	Checking the paraphrased literature review	
Mid-Semester Assignment: Writing a review of two academic journal articles with proper citation and referencing			
B. Acknowledging the use of AI in academic reading and writing			
15-17	Introducing the Use of AI in academic reading and writing	Exploring AI applications; Delivering prompts to AI; Navigating and cross-checking the response from AI; Modifying the output; Reporting the use of AI; Noticing how the AI detector works; Reflecting on using AI experience.	ARW meeting 15-17 AI used in an academic context
18-19	Drafting Literature Review	Identifying the construct and variables of the study from the title	Research gate Google scholar
20	Rewrite the Debate (background of the study, construct/variable)	Identifying the debate in building arguments on the chosen topic	Rewrite a debate
21-25	Organizing the navigated relevant studies and identifying the gap	Navigating relevant studies to identify the research gap and state the purpose of the research	Navigating relevant studies
26	Finding a mentor text	Navigating relevant studies to identify the research gap and state the purpose of the research	Finding a mentor text
27-28	Outlining your research	Finding the most relevant previous study to be the mentor	Outlining a research
Final Semester Assignments: Writing a literature review from four relevant studies, and writing an introduction for your research			

The EFL academic reading and writing materials used in this study are suitable for learners with pre-intermediate and intermediate English language proficiency levels in higher education settings. However, some students are still at a basic English language proficiency. Because it is still essential to build their basic foundations on academic reading and writing, the first author, as the lecturer of the coursework, and the second author as the first author's teaching assistant, decided to introduce the use of AI after the students demonstrate their ability to write a proper direct quotation, paraphrase, and summarize within the body of the paragraph and attach in-text citation and references by using a citation manager (in this class both authors decided to train the students how to use Mendeley).

Instruments

The instrument consists of 14 interview questions, divided into three parts. The first part elicited the participants' general perceptions of academic reading and writing, as well as self-regulation. The second part is the primary instrument for a semi-structured interview consisting of open-ended questions regarding the use of AI and self-regulated learning, adapted from Zimmerman (2000a, 2002), which consists of 3 phases: forethought, performance, and reflection of self-regulated learning, while the strategies for each stage were adapted from Zimmerman & Pons (1986). The third part elicited the use of AI applications in all three phases of self-regulated learning.

Table 2

Phase of self-regulated learning (Zimmerman, 2000; 2002), Self-regulated learning strategies (Zimmerman & Pons, 1986), and Interview Questions

The phase of self-regulated Learning	Self-regulated learning strategies	Interview Questions
Forethought Phase (In this phase, learners set goals and plan before task engagement. Learners analyze their prior knowledge and establish objectives and strategies to achieve their goals.	Goal setting and planning	What strategies do you use to plan and organize your reading and writing before drafting? (e.g., brainstorming, outlining). What AI tools do you use to support your learning?
Performance Phase (During this phase, learners execute their plans and engage in the task while self-monitoring their task, adjusting strategies, and maintaining motivation)	Seeking information	How do you monitor your progress while writing? For instance, do you set specific goals or deadlines for yourself? What AI tools do you use to support your learning?
	Keeping records and monitoring	
	Rehearsing and memorizing	Do you have any techniques for revising your work after completing a draft? If so, what are they? What AI tools do you use to support your learning?
	Organizing and transforming,	
	Seeking social assistance	How do you deal with distractions or manage your environment when working on reading and writing tasks? What AI tools do you use to support your learning?
	Environmental structuring	
Reflection Phase (This phase occurs upon task completion. Learners evaluate their strategies, assess outcomes, and consider improvement for future practice. In this phase, reflection occurs when learners internalize their experiences and make adjustments if necessary.)	Reviewing records	Can you describe any challenges you face in managing your time for reading and writing assignments? How do you overcome them? What AI tools do you use to support your learning?
	Self-consequences	Do you seek feedback on your reading and writing from others? How do you use this feedback to improve? What AI tools do you use to support your process? -How do you evaluate the quality of your

	Self-evaluation	reading and writing after completing a task? What standards do you use to assess it? What AI tools do you use to support your process?

Data Collection Procedures

The data collection method employed in this research involved a combination of semi-structured interviews and group discussions to gather in-depth insights into the AI applications students used and their perceptions of AI applications supporting self-regulated learning in their academic reading and writing coursework. Open-ended questions were chosen to ensure a comprehensive understanding of their experiences in the interview responses. Afterward, the interview recording was transcribed verbatim using TurboScribe and translated into English for further analysis and reporting.

Data Analysis Procedures

The data were analyzed by using thematic analysis. Thematic analysis, as outlined by Braun & Clark (2006), is a method used to analyze qualitative data. Thematic analysis was chosen for three reasons. First, the researchers aimed to investigate in detail what the interview transcript means in relation to what the participants perceive about the use of AI tools to support self-regulated learning. Therefore, the participants' experiences, perspectives, and reflections on the use of AI applications to support self-regulated learning were examined and described based on the analysis of emerging themes. The data was reviewed for accuracy before being analyzed and organized minimally. Through thematic analysis, the data were examined to identify key themes and patterns related to the AI applications used and the students' perceptions of using AI applications to support their self-regulated learning. These data analysis procedures are in line with Nowell et al (2017)'s, phase one to three thematic analysis. Three prominent themes emerge after exploring how students perceive AI applications as supporting their self-regulated learning in academic reading and writing.

Table 3

Thematic Coding and Theme Analysis

Parts of the Interview	SRL Initial Coding	Thematic Analysis
General Perceptions of AI	GP-AI	
Phase in Self-Regulated Learning		1. The participants perceived AI applications as a confidence builder
1. Forethought Phase	FT	
-Goal-setting and planning strategies	FT-GP-SRL	
2. Performance Phase	PP	2. The participants perceived AI applications as a performance enhancer
-Seeking information strategies	PP-SI-SRL	
-Keeping records and monitoring strategies	PP-KR-SRL	
-Rehearsing and memorizing strategies	PP-RM-SRL	
-Organizing and transforming strategies	PP-OT-SRL	3. The participants perceived the AI application as a feedback facilitator-
-Seeking social assistance strategies	PP-SS-SRL	
-Environmental structuring strategies	PP-ES-SRL	
3. Reflection Phase	RP	
-Self-evaluation strategies	RP-SE-SRL	
-Self-consequences strategies	RP-SC-SRL	
-Reviewing records strategies	RP-RR-SRL	

The second reason the researchers use thematic analysis is that the study aimed to highlight the participants' shared experiences in using AI tools for academic reading and writing coursework, as well as their awareness of the ethics involved in academic reading and writing. In sessions 15-17 of the scholarly reading and writing coursework, the participants attended a lecture session that highlighted the importance of being aware of the ethical boundaries when using AI tools. Their awareness was evident in the analyzed data, which showed that while they acknowledged the help AI tools provided with their academic reading and writing processes, they were also aware that the issue of overreliance on AI might create problems and harm the originality of their work.

The third reason why the researchers use thematic analysis is that the researchers aimed to write a coherent data interpretation report that discussed a meaningful story about the benefits and challenges of using AI tools to support self-regulated learning in the academic reading and writing process. Following Nowell et al. (2017), the researchers also reviewed the theme. They verified whether it aligned with the code extracts and the entire dataset before defining and naming each theme, and then produced a coherent report. Trustworthiness, as defined by Guba (1981), was ensured by (1) setting the criteria for the participants and ensuring that they fulfill the criteria, (2) ensuring the data's relevance to other relevant research findings within the context, and (3) ensuring the consistency of the participants' responses and biased opinions.

FINDINGS

How do students perceive the use of AI applications in supporting their self-regulated learning in academic reading and writing coursework?

The new insights presented in this study are based on perceptions collected from carefully selected participants who performed well in coursework tasks, having demonstrated a responsible use of AI to support their self-regulation in academic reading and writing. It is revealed from thematic analysis that all of the participants shared a positive perception of the use of AI tools to support their self-regulation in the academic reading and writing process. From thematic analysis, it was found that the participants perceived the use of AI applications as (1) a confidence builder and efficiency booster in the forethought phase, (2) a performance enhancer in the performance phase, and (3) a feedback facilitator in the reflection phase.

AI Applications as a Confidence Builder and Efficiency Booster in the Forethought Phase

The participants perceived AI as a confidence builder and efficiency booster in the forethought phase, which involves goal setting and planning strategies. Goal setting and planning strategies are essential in the forethought phase. Pham (2020) found that goal setting could improve EFL students' writing competence, but it was speculated that it could affect students' linguistic development. In contrast, the findings from this research demonstrated that using AI tools helps participants' linguistic development by providing them with the opportunity to check grammatical accuracy in their outlines before performing the actual reading and writing tasks. Additionally, a brainstorming session can be facilitated with the help of ChatGPT; however, it is essential to verify the response to ensure it can be traced to a credible reference or resource. Meanwhile, ResearchRabbit helps the participant find the connection between two academic journal articles, making the task of literature review more

efficient.

In terms of goal-setting strategies in the forethought phase, Lisa, for example, becomes more confident in writing because the use of Grammarly helps her by giving feedback on grammatical accuracy, in addition to using tools such as to-do lists and annotations.

> Lisa: "Before drafting, I start by brainstorming to generate ideas. After that, I create an outline to help keep things organized. Once the outline is done, I create a roadmap for my writing. For reading, I divide it into sections to keep it connected. As for AI tools, I use ChatGPT. I am also a premium ChatGPT user because I find it very helpful for my projects, especially in areas where I lack knowledge." (Code: **FT-GP-SRL**)
> Lisa: "Grammarly corrects my grammar and spelling, while ChatGPT helps me brainstorm ideas and structure my writing effectively." (Code: **GP-AI**)
> Lisa: "For managing progress, I usually make a to-do list. For reading, I highlight key points; for writing, I check off completed sections." (Code: **PP-KR-SRL**)

Moreover, Shelby mentions that Chat GPT built her confidence by helping her understand things and making the process of exchanging ideas more efficient, in addition to tracking progress over time.

> Shelby: "The first strategy I use before drafting is brainstorming. For example, I write down ideas that come up related to the topic without worrying about order or details. This helps me see the big picture of the topic I'm reading. After that, I outline the ideas to organize them into key points. This makes my writing more structured. During this process, I use ChatGPT because I can give it prompts to help me understand things I don't know. With ChatGPT, I can exchange ideas and perspectives, even though it's just technology. But I think ChatGPT still allows for a fruitful exchange of ideas, which makes the process easier for me." (Code: **FT-GP-SRL**)
> Shelby: "To track my progress, I set specific targets for each stage. For example, I plan to finish the introduction within a certain timeframe." (Code: **PP-KR-SRL**)

Finally, Carat asserts that in terms of goal-setting and planning, she also uses ChatPDF and Research Rabbit in addition to ChatGPT. ChatGPT builds her confidence in brainstorming and outlining, while ChatPDF and Research Rabbit develop her confidence in writing and make her work more efficient to summarize and navigate the references.

> Carat: "I follow the same process of brainstorming before outlining. After that, I usually look for reference journals that are related to my topic. I utilize AI tools such as ChatPDF and ChatGPT. ChatPDF helps summarize journals I find, while I use ChatGPT for brainstorming and outlining. I also use Research Rabbit to find relevant journals. (Code: **FT-GP-SRL**)
> Carat: "AI tools are very effective, especially nowadays when everything can be AI-assisted. Tools like ChatGPT, Grammarly, and ChatPDF are especially helpful." (Code: **GP-AI**)

To conclude, AI tools help the participants feel confidence by providing valuable insights to the structure and organization as goal setting and planning strategies to support their self-regulated learning in the forethought phase.

AI Applications as Performance Enhancers in the Performance Phase

The participants primarily perceived AI as a performance enhancer during the performance phase, involving activities such as efficiently gathering information with AI applications, simplifying complex materials, and structuring ideas to enhance writing output. However, not all participants used AI to manage environmental distractions. Participants used AI tools to simplify complex academic materials, making them more accessible and easier to understand and process.

> Aisah: "In academic reading, I use ChatGPT to help me summarize long texts and explain concepts that are hard to understand." (Code: **PP-SI-SRL**)
> Carat: "I use ChatPDF to summarize journals and ChatGPT to brainstorm ideas for writing tasks." (Code: **PP-SI-SRL**)
> Shelby: "When everything is monitored like this, I can see how far along I am in the process and ensure everything is completed on time. To support this progress, I also use ChatGPT, Miss. I ask for additional ideas or whether my writing process is already structured. Sometimes, I also ask for feedback to revise unclear parts." (Code: **PP-SI-SRL**)

The performance phase refers to how students engage with tasks, monitor their progress, and utilize strategies or tools to complete them effectively. This relates to organizing and transforming strategies as self-regulated learning strategies. In the performance phase, the participants viewed AI tools as valuable in supporting their academic performance. Aisha used AI applications to improve comprehension and manage cognitive load by breaking down complex material. Similarly, Carat shares the same approach in utilizing AI applications, such as ChatGPT and ChatPDF, which streamline the process of understanding and synthesizing complex information. These support task completions and content understanding, both of which are indicators of improved academic performance. Moreover, Shelby, in terms of monitoring progress, utilized AI applications more effectively, such as asking for ideas and providing feedback during the writing process. She highlighted self-monitoring, feedback-seeking, and task structuring, all of which are tied to improved revision quality and overall writing performance.

> Carat: "I usually look for reference journals that are related to my topic. I use AI tools like ChatPDF and ChatGPT. ChatPDF is useful for summarizing journals, while I use ChatGPT for brainstorming and outlining." (Code: **PP-OT-SRL**)
> Lisa: "For reading, I divide texts into sections so it stays connected. As for AI tools, I use ChatGPT Premium because I find it very helpful for my projects." (Code: **PP-OT-SRL**)

AI tools were instrumental in organizing ideas and refining the structure of academic writing.

> Shelby: "I outline the ideas to organize them into key points. This makes my writing more structured. During this process, I use ChatGPT because I can give it prompts to help me understand things I don't know." (Code: **PP-OT-SRL**)
> Lisa: "I use Grammarly to help improve my text. It's quite helpful." (Code: **PP-OT-SRL**)

Participants reported that AI applications like ChatPDF, ChatGPT, and Grammarly assist them in simplifying complex materials to enhance the structure of their writing, organizing information into manageable sections, outlining key points, and refining text quality. As Carat, Lisa, and Shelby demonstrate, utilizing these tools not only assists in understanding but also fosters a more efficient

and focused approach to studying and writing. Barrett & Pack (2023) emphasize the crucial role AI tools play in assisting students in organizing their ideas and enhancing the quality of their writing. As Shelby points out, the ability to outline ideas using ChatGPT not only helps in organizing thoughts but also fosters a deeper understanding of the writing process itself. This reflects the organization and transforming strategist in SRL as a participant.

Participants also used AI tools to overcome procrastination and stay on track with their academic tasks.

> Shelby: "Procrastination is my biggest challenge. I prioritize tasks from easiest to hardest, and ChatGPT helps me generate ideas and stay on track." (Code: **RP-SC-SRL**)
> Carat: "I also struggle with procrastination. I use ChatGPT to generate ideas and support me in completing tasks effectively." (Code: **RF-SC-SRL**)

Ma & Chen (2024) reviewed studies on integrating AI applications in ELT/L involving Chinese EFL learners. They found that using AI applications enhances learners' engagement and diminishes academic procrastination.

Additionally, in this phase, Ozfidan et al. (2024) found that integrating AI into academic writing provided significant benefits for students in several ways. Students report that the suggestions provided by the AI tool are invaluable in improving their writing skills. Specifically, these tools help students meet academic writing deadlines effectively, which is a crucial aspect of their educational success. AI is also perceived to facilitate the organization of their ideas and arguments, making their writing more coherent and structured and played a crucial role in enhancing the overall clarity of their academic writing, enabling them to communicate their thoughts more effectively

However, in terms of environmental structuring, the participants emphasized the importance of creating focused environments to manage distractions during academic tasks, as well as utilizing digital tools and effective learning techniques.

> Aisah: "I try to create a quiet environment. I always activate the 'do not disturb' mode on my phone and laptop to keep my focus." (Code: **PP-ES-SRL**)
> Lisa: "I silence notifications and use the Pomodoro technique, which is 50 minutes of focused work followed by a 10-minute break." (Code: **PP-ES-SRL**)

AI Applications as Feedback Facilitators in the Reflection Phase

The participants primarily perceived AI as a feedback facilitator in the reflection phase, supporting self-regulated learning, including self-evaluation (cognitively, behaviorally, and affectively), as well as reviewing records. Participants utilized AI tools to evaluate their academic work, with a focus on originality, coherence, and structure.

> Aisah: "I evaluate the quality of my writing by checking several aspects, like clear structure, grammar, and writing style. I use Turnitin to check for plagiarism." (Code: **RP-SE-SRL**)
> Lisa: "I use Grammarly to check the structure first. Then, I use ChatGPT to ask, 'What are the weaknesses in my writing?'" (Code: **RP-SE-SRL**)

The use of AI applications for self-evaluation and feedback incorporation among undergraduate students is particularly significant. The participants' perceptions reflected a growing trend in which AI technologies, such as ChatGPT, serve as essential companions in the academic writing process. As highlighted by Chauke et al (2024), ChatGPT not only assists students in assessing the quality of their work but also provides constructive feedback that enhances their writing skills. The findings in this research align with those of Chauke et al. (2024), which emphasize the role of AI in improving academic outcomes. Hatmanto and Sari (2023), for example, in their interview with lecturers who taught technology-integrated courses in English Education departments at universities in Yogyakarta, found that the theoretical framework of task-based learning that aligns with using Chat GPT includes a task-based approach, language use in context, learner engagement, language accuracy and fluency, and learner autonomy. In line with this finding, Ozfidan et al. (2024) also found that AI applications, such as grammar tools and spell checkers, significantly improved the quality of their academic writing by not only correcting language errors but also providing valuable feedback on writing style, allowing the students to revise and refine their work effectively.

Finally, participants leveraged feedback from peers and lecturers, supported by AI tools, to refine their academic work.

> Shelby: "I ask for feedback from friends or lecturers, and ChatGPT provides suggestions regarding sentences that may still be unclear." (Code: **RF-RR-SRL**)
> Lisa: "I review feedback comments and ensure I don't repeat the same errors in the future." (Code: **RF-RR-SRL**)

In self-reflection phase, tools such as Grammarly, Quillbot, and ChatGPT were utilized to evaluate their work, which primarily involves critical academic reading following writing. Bibi & Atta (2024) revealed that AI writing assistants play a significant role in education, highlighting that AI applications, such as ChatGPT, can broaden the ways students learn and enhance their writing skills. The personalized feedback provided by these tools helped students identify their strengths and areas for improvement, which further contributed to their academic growth in English reading proficiency (Chea & Xiao, 2024). With the help of AI, students can get feedback, support, and guidance that helps them improve their writing abilities.

DISCUSSION

In this research context, the AI tools that the participants used to support their self-regulated learning in academic reading and writing are: ChatGPT, Chatpdf, Research Rabbit, Grammarly, and Quillbot. The researchers also learned that the instructional design of academic reading and writing coursework, which included three sessions of using AI tools in academic reading and writing in seven highlighted topics: exploring AI applications, delivering prompts to AI, navigating and cross-checking the response from AI, modifying the output, reporting the use of AI, noticing how the AI detector works, and reflecting on using AI experience, enhances the participants' awareness of responsible use of AI.

In the context of goal setting and planning, the application of AI plays a crucial role in building confidence and enhancing efficiency in task completion. The participants of this study highlighted that one of the benefits that ChatGPT and other AI tools offer is that it can help them generate and organize ideas. They recognize the ability of AI applications to generate ideas, organize essays, and receive immediate feedback on their drafts with the help of these tools. This finding is in line with

Barrett & Pack (2023) who found that, for every phase of the writing process, most students used AI applications to generate ideas, model responses, or as a means of cognitive release for tasks that they were already skilled at performing. All of the participants in this study shared a positive perception on the use of AI to support their forethought phase in academic reading and writing. This finding in line with Ozfidan et al. (2024) who highlighted several key findings, particularly in the context of academic writing, where AI applications can assist students in generating ideas and provide a solid framework for their academic writing.

This finding also aligns with Chan & Hu (2023), who found that university students are generally becoming increasingly familiar with generative AI (GenAI) technology, such as ChatGPT. In their study, the students highlighted that generative AI, specifically ChatGPT, supports them not only in their academic writing but also in other forms of writing. They explained that as an AI application, ChatGPT can facilitate literature searching, summarize reading, and even generate hypotheses based on data analysis. Furthermore, in academic writing, generative AI applications like ChatGPT can be utilized as writing assistants. One of the findings revealed that students felt that implementing AI and technology in English academic writing enables them to convey their writing ideas more effectively. This reflects a mature SRL strategy facilitated by AI, indicating that these AI applications support both the cognitive and behavioral dimensions of performance and align with key SRL strategies, including seeking information, seeking social assistance, organizing, and transforming. AI tools supported participants in simplifying academic materials and organizing them into manageable sections. The participants of this study perceived environmental structuring strategies as part of their performance phase. They did not use any AI tools and use conventional approach in minimizing distractions (turn off notificiations) and Pomodoro technique. They also perceived seeking information strategies integrated in the performance phase.

The findings also align with Chea & Xiao (2024) and Barrett & Packs (2023)' studies. Chea & Xiao (2024) indicated that tools powered by AI offered significant improvements in students' English academic reading skills. Their study revealed that the use of AI applications had a positive impact on reading comprehension and vocabulary acquisition. Additionally, these findings showed that students who use these AI tools experience increased motivation and increased confidence regarding their reading abilities. Barrett & Packs (2023), who stated that AI applications can function as a virtual tutor, providing personalized feedback and guidance to improve writing results. Additionally, the participants use of Grammarly underscores the importance of AI in enhancing text, as it enables students to identify grammatical errors and improve clarity, ultimately contributing to a more polished final product. This integration of AI tools reflects a shift in writing teaching, where technology is being utilized to support cognitive processes and improve overall writing proficiency.

However, students should also pay attention to the responsible use of AI. Eke (2023) argues that large language model developers OpenAI and others should be eager to collaborate with academics to enable safe use of AI-driven text generators. Academia should consider both opportunities and challenges of Gen-AI and take responsible use of AI. Moreover, Bozkurt (2024) emphasizes the importance of Gen-AI literacy- encompassing knowing what, how, and why to use AI tools. Responsible use of technology in education is indeed very important. As Renandya & Floris (2025) argue, to ensure responsible use of AI in writing, it should be noted that conscientious reading is necessary in reviewing and revising content, language and organization of writing.

The findings of this study suggest that AI applications were perceived as beneficial in supporting students' self-regulated learning for academic reading and writing in the forethought, performance, and reflection phases. However, with four participants recruited with specific criteria, caution must be applied, as the findings might not be representative of describing all of the students enrolled in academic reading and writing coursework's experiences.

One classroom implication of this is that universities should not completely forbid the use of AI applications in the learning process. AI applications can be used to support EFL students' self-regulated learning in academic reading and writing, as long as it does not violate academic integrity and research ethics. Integrating AI tools can enhance students' cognitive and metacognitive strategies, enabling them to plan, monitor, and assess their own work as they work towards mastery. For teacher classroom practice, teachers can also implement the responsible use of AI applications, such as ChatGPT, Grammarly, Research Rabbit, Quillbot, and ChatPDF, to assist with lesson planning, idea development, progress tracking, and outcome evaluation. This, in turn, increases students' confidence and their ability to tackle academic tasks efficiently.

One possible solution that a lecturer may use to avoid the students' academic misconduct is by setting clear coursework rules about how the responsible use of AI should be done. For example, by stating explicitly in the course overview at the beginning of the coursework how AI should or should not be used. An AI tool, such as Chat GPT, for example, can be used to help generate/synthesize ideas and brainstorm the initial topic for academic reading and writing with the awareness that the content generated may be hallucinations, inaccurate, incomplete, or otherwise problematic. Because of this, anything generated by AI must be double and triple-checked for accuracy, and organizing references in citation managers, such as Mendeley, and creating a traditional synthesis grid is a must.

Another possible effort by lecturers to enhance the responsible use of AI practice is to clearly set boundaries, stating that students cannot submit any work generated by an AI application without proper acknowledgement following academic citation guidelines. The lecturers should also be clear that no AI rules can be implemented in assignments that require in-depth individual review, analysis, and reflection.

CONCLUSION

The findings revealed that AI applications were perceived as beneficial in supporting students' self-regulated learning for academic reading and writing in the forethought, performance, and reflection phases. The analysis confirms that participants actively integrate AI tools into all phases of academic reading and writing. This research gives empirical contributions on how AI applications can support students' self-regulated learning in academic reading and writing coursework. However, these opportunities should also be well-considered to take responsibility for educational ethics and integrity. For best practice, this study implies that both educators and students should have sufficient Gen AI literacy to support students' self-regulated learning. Gen AI literacy will enhance the responsible use of gen AI in education. For education policy, this study suggests that policymakers at universities should establish clear regulations on the responsible use of AI to maintain academic integrity. Additionally, creating workshops and training for civitas academia can enhance Gen AI literacy.

This study is limited to one classroom of academic reading and writing coursework, with a small

number of participants. Future research may involve more participants and a broader scope of the study to enrich the discussion on the use of AI applications in academic reading and writing coursework. In addition, future research employing a mixed-methods research design can also provide policymakers with more comprehensive perspectives on designing regulations for human-AI interaction in foreign language education.

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