



Navigating AI in Producing Cohesion Devices on the Preparatory Paragraph of Essay

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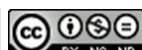
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ABSTRACT

Even though technology is the subject of numerous studies, none of them have systematically investigated the upgrading of technology skills in navigating AI to produce cohesion devices, especially in preparatory paragraphs in writing in the ELT context. The investigative approach employed in this study utilized qualitative descriptive methods with thematic and written discourse analysis. The aim of the research is to find out how the teacher students navigate the AI in creating Cohesion Devices in the Preparatory Paragraph of the Essay. The data for this study comprised introductions extracted from the final project essays of English Department undergraduate students during the academic year of 2020-2021. The findings of this study imply that students are less exposed to diverse AI-supported writing because they only integrate ChatGPT, Grammarly, Quilbot, and DeepL AI writing tools in their essays. Students found themselves indirectly using AI, but they also used their critical thinking skills. Brainstorming, Structured Questioning, Idea Selection, and Appropriate Choice are the lead indicators to perceive AI Suggestion adaptation.

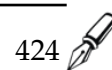


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INTRODUCTION

In recent years, Technology Enhanced Language Learning (TELL) has completely revamped language education, using digital tools and platforms to support student learning in a diverse range of subjects (Adipat, 2021; Hu et al., 2025). In particular, mobile devices, multimedia, and game-based learning applications allow teachers to render lessons as engaging and interactive as possible (Sharma et al., 2025; Tang & Liao, 2025). These technologies thus aid students in organizing new information, relocating it to what they currently know, and using memory aids to retain knowledge, ultimately improving their learning efficiency (Akcil et al., 2021; Bui, 2022; Widajati & Mahmudah, 2023). In addition, TELL also makes it easier for students to communicate with each other and educators around the world, thus expanding their learning experience (Pallathadka, 2020; Prayudi et al., 2021). As technology is steadily molding the academic landscape, how can teachers embed these advancements in a way that maximizes their potential to enhance language learning, especially in the learning of academic writing?

The Integration of Technology and Language Learning has significantly impacted academic writing, which plays a pivotal role in academic success, particularly in higher education, where it is a critical tool for sharing ideas and contributing to global academic discussions (Sanosi, 2025). A key aspect of academic writing is crafting well-organized, cohesive introductory paragraphs that both grab the reader's attention and present the main argument of the essay (Li & Huang, 2022; Zhang et al., 2022). These introductory paragraphs serve as the foundation for the entire



essay, outlining the topic and providing the thesis statement. However, equally, the challenge lies in ascertaining that ideas flow out logically from one to another, which requires skillful use of cohesion devices such as conjunctions, reference words, and lexical links (Alawerdy & Alalwi, 2022). Many students struggle to sustain cohesion in their writing, either by overusing certain words or failing to connect ideas meaningfully (Baharudin et al., 2023). Therefore, mastering the use of technology and the language skills within these cohesion devices is crucial to improve the overall coherence of academic writing. According to a study by Wijanarko (2024) and Yu (2022) educators use an array of multimedia tools, like computers, mobile devices, printed materials, audio players, and PowerPoint slides, to assist pupils in boosting their vocabulary, listening, reading, and grammar skills. If it is used to the full extent, these tools help students tackle obstacles in writing by gaining hands-on practice and direct feedback, especially in improving the cohesion of their academic writing (Fauzan et al., 2022; Taye & Mengesha, 2024).

Given the centrality of academic writing, the organization of essays plays a crucial role in determining overall writing quality. The study by Lu and Pan (2024) highlights that well-organized essays obtained noticeably elevated ratings across all scoring criteria as opposed to the less organized essays, revealing that raters prioritized the qualities of the essay as a whole rather than certain scoring criteria. Additionally, the impact of essay organization is particularly pronounced in essays of lower overall quality. While most student proposals exhibit effective organization, some fall short in providing adequate supporting details and explanations, and occasional disruptions in the flow of ideas. Given this, providing students with standardized thesis writing guidelines, rubrics, and opportunities for constructive feedback can significantly enhance their organizational skills and writing quality (Fauzan et al., 2022; Khadawardi, 2022).

Despite the importance of structured writing, students continue to face significant challenges in academic writing that hinder their proficiency. Jiang and Su (2025) identifies key difficulties, including issues with vocabulary, grammar, punctuation, plagiarism, and text structure. These challenges are exacerbated by instructional approaches that rely heavily on literary texts while lacking specialized courses in academic literacy. Similarly, in many educational settings, integrating reading and writing instruction remains a challenge, often leading to fragmented skill development. While fundamental competencies in information comprehension are emphasized, other crucial writing skills tend to be overlooked. This highlights the need for a more comprehensive approach to academic writing instruction, ensuring students acquire the necessary competencies to succeed in both academic and professional contexts.

One of the essential aspects of academic writing is cohesion, which ensures a smooth flow of ideas and clarity in essays. To address these issues, Cortes (2023) and Kim with Kessler (2022) stated that cohesion is an essential element of effective writing, enabling readers to effortlessly grasp the text's meaning and craft clear paragraphs that effectively convey their message. However, many L2 students struggle with cohesion due to lexical continuity and reference use issues (Setiawan & Taiman, 2021). Approximately 48% of students need to enhance their cohesive writing, notably sentence construction and grammatical precision (Apridayani & Waluyo, 2025). Despite the use of several instructional strategies, such as strategic planning, students continue to struggle with employing reference and conjunction devices (Trisnaningrum et al., 2019). Insufficient language competency, restrictive reading, inefficient instruction, and low motivation all contribute to poor cohesion (Budjalemba & Listyani, 2020; Leli, 2020).

Among the most promising recent advances in language education is the integration of Artificial Intelligence (AI) tools. AI-powered writing assistants such as Grammarly, Gemini, Quillbot, ChatGPT, and Google Bard are increasingly popular for providing real-time feedback on writing, including grammar, vocabulary, and cohesion (Fitria, 2021; Adauto Medina et al., 2024; Alamri et al., 2025; Garg et al., 2024; Bareq Raad Raheem et al., 2023). These tools assist students in refining their use of cohesion devices by suggesting the right conjunctions, reference words, and lexical links, ultimately improving the flow of their writing. AI helps students make better word choices and construct clearer sentences, reducing issues like repetition and poor idea connection (Fasanmi A S, 2025; Livberber & Ayvaz, 2023). However, the true effectiveness of AI

in improving writing skills is still up for debate. Some studies suggest that over-reliance on AI may prevent students from developing a deeper understanding of the cohesion principles that underlie strong writing (Hammad, 2023; Jeyaraman et al., 2023). This raises important questions about how AI can be used in a way that supports long-term writing development rather than just providing temporary fixes.

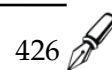
While AI tools offer immense promise in improving writing cohesion, their deployment comes with its own set of challenges. One of the foremost issues is how students might adapt the suggestions generated by AI to suit the context and purpose of their essays. Not all AI restrictions can be directly enforced without modification, which means students must be able to assess and integrate the feedback in a meaningful and critical way (Banihashem et al., 2024; Chan et al., 2024; Lo et al., 2025). In addition, there are apprehensions that over-reliance on AI may stunt creativity and foster independent thinking, leading to ethical issues such as plagiarism (Hassanipour et al., 2024; Homolak, 2023). The validity of AI tools also varies based on learners' writing ability. Some users may use AI as a helpful analytical tool, while others may merely accept suggestions regardless of the underlying principles (Alharbi, 2023a). For this reason, it is pertinent to capture how users interface with the AI and whether they critically engage with the suggestions provided or passively accept them.

Based on this, this study primarily explores how AI tools foster the use of cohesion devices in introductory paragraphs of academic essays. The research will focus on the identification of specific AI tools used by pre-service teachers, the types of cohesion devices suggested by these tools, and how students incorporate these suggestions into their writing. Through text analysis, surveys, and interviews, this study delved into the types of AIs that have been used, the patterns of cohesion devices suggested by the AIs, and how students implement these suggestions. The results of this study aim to illuminate the effectiveness of AIs in teaching writing cohesion and provide insight into how AIs can be integrated into academic writing instruction. This research yields valuable recommendations on how AI can help students improve their writing skills, especially when it comes to composing cohesive and well-organized introductory paragraphs.

RESEARCH METHOD

This research uses a case study design to navigate the types of AI tools to generate cohesion in the final project essay. This study focuses on data comprising final project essays written by English Department undergraduate students at a university in Indonesia. The population of this study is English Education students at a university in Indonesia. They are pre-service teachers who will be anonymized as PT1, PT2, PT3, and so on, to ensure their identities are protected during the study. Their participation is voluntary and will not affect their grades or academic performance. Informed consent was obtained from all participants. The sample was the essays of pre-service teachers in their final semester who took Argumentative Writing Class A, which was conducted from January to May 2023.

To collect the data, the authors use documentation and observation as the main instruments. Documentation included the collection of students' final project essays, specifically focusing on the introductory paragraphs. Observation involved reviewing the students' writing process and their interactions with AI tools. Additionally, a closed-ended Likert-scale questionnaire was distributed via Google Forms to gain insights into the students' experiences and perceptions on how they use AI tools to assist them in writing introductory paragraphs. To analyze the data, the authors use two phases. In the first phase, the researchers conducted textual analysis by using Halliday and Hasan's cohesion devices framework, which focuses on reference, substitution, ellipsis, conjunction, and lexical cohesion to assess the cohesion devices of the introduction. In the second phase, the authors employ thematic analysis, which often leads to fresh insights and understanding. The study ensures themes are insightful interpretations, not just simple summaries of topics, reflecting the participants' deep perspectives.



RESULTS AND DISCUSSION

Result

Types of AI Writing Tools used by the Pre-Service Teacher

The finding shows ChatGPT, Quillbot, Grammarly, and DeepL Translator are the most frequent and favorite AI platforms. It seems students are less exposed to diverse AI-supported writing.

RQ1 = *What type of AI do you use to create cohesion devices in the preparatory paragraph of your essay?*

"I used ChatGPT, Grammarly, and Quillbot to create cohesion devices in the introductory paragraph of my essay. Grammarly to check fluency and cohesion, especially in the use of conjunctions and reference words. Quillbot helps the writer ensure lexis operation so that cohesion does not feel monotonous. ChatGPT helps provide suggestions for transitions within paragraphs, improving writing and recommendations for using appropriate cohesion devices." (reflection, 08/04/2025, PT1, Female)

PT2's assertion also supports it:

"The first is ChatGPT, and the second is Quillbot, or sometimes I use deep learning. I use it to help generate cohesion devices during the preparation of making it easy." (reflection, 08/04/2025, PT2, Male)

Types of Cohesion Devices are Often Obtained from the AI

Most AI used by pre-service teachers recommend types of cohesion such as references, repetition, lexical, and conjunctions. According to Halliday and Hasan in Setiawan and Taiman (2021) cohesion is necessary for ensuring that a text is clear and well-structured, as it allows for the interdependence of different elements within the discourse.

RQ2 = *What types of cohesion devices are often obtained from the AI you use?*

"AI often suggests different types of cohesion devices such as pronoun references, past words, lexical changes, and conjunctions." (reflection, 08/04/2025, PT2, Male)

Table 1. The number of occurrences and percentages of forms of cohesion

Text	Reiteration	Conjunctions	References
PT1	5	3	3
PT2	6	3	3
PT3	8	3	3
PT4	7	3	3
PT5	7	3	4
Total	33	15	16
%	51,56	23,44	25

The table shows that there are 64 cohesion ties in the 5 student essay introductions, focusing on Reiteration, Conjunction, and Reference. Grammatical and lexical cohesion appear in this data.

Lexical Cohesion

Reiteration

Reiteration is the dominant cohesion device used in the analyzed text, with a percentage of 51.56%. It involves repeating the same or similar words to connect ideas. This technique encompasses repetition, synonyms, superordinate, and general words, all establishing semantic links by employing identical or related vocabulary.

Table 2. Examples of reiteration in students' essays

Text	Participants
- <i>Transportation is predicted to be one of the main contributors to the increase in geothermal effects. (Text 1)</i>	PT5
- <i>This is largely caused by the extensive use of fossil fuels, which emit carbon dioxide during combustion. (Text 1)</i>	

Text	Participants
- To address this issue, the development of <i>electric vehicles (EVs)</i> has gained momentum as a potential <i>solution</i> to combat climate change. (Text 1)	
- Unlike vehicles powered by petroleum fuels, EVs do not produce <i>harmful emissions</i> during use. (Text 1)	
- In fact, electric vehicle <i>battery waste</i> is difficult to recycle. (Text 1)	
- While EVs may seem like a <i>promising solution</i> , their use contributes to environmental problems rather than providing solutions. (Text 1)	

From the table above, lexical cohesion can be observed in both synonymous terms and related vocabulary, such as "contribute" and "cause", "combustion" and "use", as well as "potential solution" and "promising solution". These lexical choices enhance the text's coherence and readability.

Lexical cohesion is also established through exact repetition, where several key terms are repeated to emphasize their significance. For instance, "transportation" is repeated to highlight its role in contributing to the increase in geothermal effects. "Fossil fuels" appear twice to underline their major impact on environmental problems. The term "electric vehicles (EVs)" is used repeatedly to introduce and contrast their characteristics with conventional vehicles. Similarly, "harmful emissions" is repeated to stress the environmental impact differences between EVs and fossil fuel-powered vehicles. Lastly, "promising solution" is reiterated to first present EVs as a hopeful response to environmental concerns, and then to challenge that perception.

Grammatical Cohesion

Conjunctions

The use of conjunctions appeared in third position with a percentage of 23,44%, a slight difference compared to the use of reference words. Conjunctions serve as linguistic tools that establish cohesive semantic relations, specifying how subsequent information is systematically linked to preceding information. Four main categories of conjunctions exist: additive, adversative, temporal, and causal.

Additive Conjunctions

PT3 uses "*and*" and "*also*" to express additive conjunction in their essay, while PT1 uses "*in addition*."

Table 3. Examples of additive conjunction in students' Essays

Text	Participants
- AI can support teachers... <i>and</i> help them do a better job. (Text 2)	PT3
- AI can <i>also</i> teach students skills or reinforce difficult concepts... (Text 2)	
- <i>In addition</i> , effective waste management... (Text 3)	PT1

Adversative Conjunctions

From the examples in Table 4, PT3 uses "*while*" and PT1 uses "*however*" to introduce contrast or opposing viewpoints.

Table 4. Examples of adversative conjunctions in students' essays

Text	Participants
- <i>While</i> AI has the potential to revolutionize many industries... it is unlikely to replace human teachers... (Text 2)	PT3
- <i>However</i> , one aspect that often gets overlooked... (Text 3)	PT1

Temporal Conjunctions

From Table 5, "*doing so*" is used by PT3 as a causal expression to explain consequences.

Table 5. Examples of causal conjunctions in students' essay

Text	Participants
- <i>Doing so</i> would not only exacerbate tech dependence... (Text 2)	PT3

Causal Conjunctions

The analysis showed in Table 6 that PT1 uses "*since*" and "*during*" in the sentences to mark temporal relationships.

Table 6. Examples of temporal conjunctions in students' essay

Text	Participants
- <i>Since</i> the outbreak began... (Text 3)	PT1
- Protection <i>during</i> this pandemic. (Text 3)	

Reference

Reference appeared in the second position, with 25% used by pre-service teachers. Reference, one of the key components of grammatical cohesion, is categorized into three types: personal pronouns, demonstrative pronouns, and comparative pronouns.

Personal Pronouns

From Table 7, it seems PT2 uses the reference "*their*" to refer to "*individuals*" and is a possessive pronoun, indicating the understanding belongs to those individuals. It shows ownership and cohesion by linking back to the subject. On the other hand, PT1 uses "*ourselves*" as a reflexive pronoun referring to "*we*", indicating the same subject and object. It emphasizes personal responsibility in protection efforts.

Table 7. Examples of personal pronouns in students' essay

Text	Participants
- Individuals acquire knowledge, develop skills, and grow in <i>their</i> understanding of... (Text 4)	PT2
- ...we have all learned about the importance of protecting <i>ourselves</i> from... (Text 3)	PT1

Demonstrative Pronouns

In Table 8, the PT4 uses "*this*" as a demonstrative pronoun referring to the previously mentioned topic. It functions to summarize and point back to the entire idea or issue just discussed, maintaining cohesion. PT5 uses "*this*" to refer to the increase in geothermal effects. It helps avoid repetition by summarizing a prior clause while maintaining logical flow.

Table 8. Examples of demonstrative pronouns in students' essay

Text	Participants
- <i>This</i> can potentially impact human workforce displacement... (Text 5)	PT4
- <i>This</i> is largely caused by the extensive use of fossil fuels, ... (Text 1)	PT5

Comparative Pronouns

From the following table 9, PT2 chooses the word "*the most*," which is a superlative, indicating comparative reference that shows the degree of importance among multiple factors. On the other hand, PT5 uses the word "*unlike*" to introduce a comparison between two entities, EVs and petroleum-fueled vehicles, showing a difference in behavior (emissions). This is a comparative reference for non-identity. While PT3 applies the word "*better*" to compare the quality of the teacher's job with and without AI.

Table 9. Examples of comparative pronouns in students' essay

Text	Participants
Thus, a teacher's quality is <i>the most</i> important factor in ... (Text 4)	PT2

<i>Unlike vehicles powered by petroleum fuels... (Text 1)</i>	PT5
<i>AI can support ... and help ... a better job. (Text 2)</i>	PT3

Cognitive Strategies for Adapting and Utilizing AI Suggestions in Essay Writing

Adaptation of AI Suggestions

The finding shows that Pre-service Teacher (PT3) not only use AI, but they also use their critical thinking skills. Critical thinking encourages curiosity and continuous learning, avoids fabrication and hoaxes, and allows us to analyze problems more sharply and find effective solutions. Critical thinking is one of the skills that is crucial to an individual's career success (Ellerton et al., 2024; Leibovitch et al., 2025).

RQ3= How do you adjust the suggested cohesion devices from AI with your preparatory paragraphs of the essay?

"I don't just copy the suggestions directly. I usually read them first, then I adjust the words based on the context of my paragraph. Sometimes I change the position of the device or modify the sentence, so it sounds more natural and matches my writing style." (reflection, 14/04/2025, PT3, Female)

"I don't just copy the suggestions directly. I usually read them first...." (reflection, 14/04/2025, PT3, Female)

It seems reasonable to argue that PT3 not only uses AI, but they must also criticize in thinking. In critical thinking, there is a brainstorming process that can be creative and open-minded, because it is the process of generating a wide range of ideas, helping people to explore all possible solutions (Prominski & Tian, 2020; Wang & Wang, 2025).

"Then, I adjust the words based on the context of my paragraph." (reflection, 14/04/2025, PT3, Female)

It seems to make sense with the PT3 argument, because with students asking about what cohesion devices are suitable, they need the ability to formulate structured questions and choose the cohesion device ideas selected from the AI in order to write quality essays (Karadağ & Ozar, 2025; Mei et al., 2025).

"Sometimes I change the position of the device or modify the sentence, so it sounds more natural and matches my own writing style." (reflection, 14/04/2025, PT3, Female)

It seems to make sense with the PT3 argument, by making appropriate, it indicates that one does not just blindly choose, but thinks logically, considers the context, and evaluates the options before deciding (Cumming, 2020; Michel et al., 2025). The appropriate choice is choosing and adapting ideas to fit your writing in the best way. This indicates the ripeness of thinking and the aptitude to filter information

Prompt Design and Purpose Alignment

Based on the findings, the prompt design should be detailed. We don't need to go around correcting or re-querying. Once the user gives a prompt, the user can immediately get an answer that is close to what the user wants. The use of detailed design prompts will produce more precise results and streamline time (Gupta & Shivers-McNair, 2024).

"What are good transition words to connect these ideas in an academic essay?" (reflection, 07/04/2025, PT4, female)

"I usually ask the AI something like, 'Can you help me improve the flow of this paragraph, or what are good transition words to connect these ideas in an academic essay?'" (reflection, 07/04/2025, PT4, female)

Based on the findings, it makes sense that the PT4 statement prompt design should be clear. If you write a vague prompt, the AI may misunderstand. The more you make clear and specific prompts, the more you learn to express your ideas precisely (Kasirzadeh & Gabriel, 2023; Robertson et al., 2024). These findings also show a cause-and-effect relationship. It means you want to improve the flow of your paragraph, and you understand that using transition words can help achieve that. Creating logical prompts also helps to be more critical and analytical. By

crafting logical prompts, we grow accustomed to organizing ideas based on cause-and-effect relationships, goals, and workarounds (Stornaiuolo et al., 2025).

Final Decision-Making

Based on the findings, apparently, with PT5's assertion that in the final decision-making process, we should think about the alignment between the essay and the prompt design of AI. The AI platform probably gives you a handful of sentence paths, but without alignment, you risk being left with something that sounds good but fails to hit the mark. Chivileva (2024) explain that alignment of sentences enables you to revamp and align the logic and flow of your writing to make it stronger.

"I assess the decisions generated by the AI, then I choose the best ones that suit my purpose and writing style." (reflection, 11/04/2025, PT5, female)

"...and edit to personalize them." (reflection, 11/04/2025, PT5, female)

From the findings above, it can be concluded that in the final decision-making process after using AI, we should humanize the language. Ferrario (2024) highlight that readers are capable of discerning between writing that is "copy-pasted from AI" and what humans genuinely think and speak. Humanized language feels more genuine, evocative, and biblical.

"I also compared different versions to see which one had a smoother flow and clearer logic." (reflection, 11/04/2025, PT5, female)

Apparently, with PT5's assertion, a realistic flowchart is timesaving and efficiency-enhancing in essay writing. Final decision-making necessitates a realistic flowchart because it helps the writer make decisions that are purposeful, logical, efficient, and in line with the paper's needs (Ashraf et al., 2024).

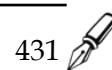
Discussion

Referring to the research data obtained, the discussion in this research is that pre-service teachers predominantly use ChatGPT, Grammarly, Quillbot, and DeepL to enhance cohesion in their introductory paragraphs. Each platform offers distinct advantages: ChatGPT supports the logical tone and structure of academic writing, Quillbot helps with lexical variation to avoid monotony, Grammarly aids in improving fluency and grammatical cohesion, and DeepL provides refined translations with smoother transitions (Muthmainnah et al., 2025). These results align with the shift in ELT towards integrating digital tools that foster clarity and coherence in student writing (Maisa & Linda, 2024; Maisa et al., 2024).

Halliday and Hasan in Setiawan and Taiman (2021) stated that Cohesion in writing is achieved through grammatical and lexical means. Grammatical cohesion includes reference, substitution, ellipsis, and conjunctions, while lexical cohesion comprises repetition and synonym. The data in this study revealed that the most frequently used forms of grammatical cohesion were conjunctions and reference devices, specifically personal, demonstrative, and comparative references. Lexical cohesion was primarily achieved through repetition and the use of semantically related vocabulary (Conroy A, 2010; Conroy, 2010; Dobson, 2007; Geyte, 2013; Sumakul et al., 2022).

Repetition, or exact reiteration, was the most common form of lexical cohesion. As Halliday and Hasan noted, repetition enhances clarity, emphasizes key points, and reinforces conceptual links. While it serves to improve readability, overuse may reflect limited lexical variation. Thus, tools like Quillbot play a critical role in introducing synonymy, offering students a broader lexical palette to maintain cohesion without redundancy (Alharbi, 2023b; Kervin et al., 2017; Kvashnina & Sumtsova, 2018).

Grammatical cohesion, particularly through conjunctions, was also prominent. As described by Mandarani (2020) and No (2021), additive (e.g., "and," "also"), adversative (e.g., "but," "however"), temporal (e.g., "then," "after"), and causal conjunctions (e.g., "because," "so") serve different rhetorical purposes that link ideas effectively. Similarly, reference mechanisms – such



as personal pronouns, possessive determiners, and demonstrative indicators – were utilized to maintain consistency and avoid repetition (Dobson, 2007; Geyte, 2013; Sumakul et al., 2022).

Importantly, the study also examined how students adapted AI-generated suggestions. Three cognitive strategies emerged: critical thinking, prompt design, and final decision-making. Critical thinking is manifested through brainstorming, structured questioning, and selecting appropriate AI suggestions (Cumming, 2020; Ellerton et al., 2024). These strategies demonstrate students' awareness of aligning AI input with their writing goals (Alharbi, 2023b; Sumakul et al., 2022).

Furthermore, prompt design significantly influenced the quality of AI feedback. Effective prompts were detailed, clear, and logically structured – allowing for more targeted suggestions (Gupta & Shivers-McNair, 2024; Kasirzadeh & Gabriel, 2023). This aligns with the growing recognition that prompt engineering is a vital skill in AI-assisted learning (Maisa et al., 2024).

Taken together, these findings indicate that while AI tools assist in generating cohesive writing, the students' agency in navigating, adapting, and evaluating AI feedback is essential. The discussion reinforces the importance of AI literacy, which includes not only the technical use of tools but also the metacognitive strategies needed to produce academically appropriate and coherent texts. Therefore, writing instruction should incorporate guided use of AI alongside explicit teaching of cohesion principles and critical thinking strategies to foster deeper learning outcomes (Alharbi, 2023b; Venkatesh, 2022).

CONCLUSION

The study's findings limit three key areas: the types of AI tools used, the cohesion devices commonly suggested by these tools, and the cognitive strategies pre-service teachers use to meaningfully integrate AI-generated suggestions. First, ChatGPT, Grammarly, Quillbot, and DeepL Translator stand out as the highest-used AI platforms. However, despite the widespread uptake of these tools, this study also divulged that pre-service teachers who had marginal access to larger AI platforms wrote down a need to improve digital tool literacy. Second, this study revealed that AI tools chiefly prescribe three types of cohesion devices: reference, lexical repetition, and conjunction. Thirdly, and perhaps most importantly, this study reveals how pre-service teachers cognitively process AI suggestions, which are conceptualized into three themes: Critical Thinking, Proper Goal Design and Alignment, and Final Decision Making. While AI tools help pre-service teachers boost cohesion in academic writing, the deeper significance lies in how they use these tools with critical awareness. This study revealed an expanded ability to apply AI thoughtfully and strategically, rather than blindly relying on AI. These findings hint at the need to integrate AI literacy into teacher education programs, prepping future educators to use such technologies responsibly and creatively to support student writing.

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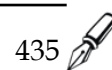
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