



EXPLORING EFL STUDENTS' PERSPECTIVES ON INTEGRATING GEMINI AI CHATBOT'S IN ACADEMIC WRITING COURSES

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Abstract: This study investigates Vietnamese university students' perceptions of the benefits and challenges associated with the use of the Gemini AI chatbot in EFL academic writing. The participants were 170 second-year English majors with intermediate English proficiency who took part in a 15-week blended instructional intervention. Data were collected through questionnaires and semi-structured interviews and analyzed using descriptive statistics and thematic analysis. The findings indicate that students perceived substantial benefits from Gemini, particularly in cognitive domains such as idea generation, essay organization, and vocabulary development, as well as in affective dimensions, including increased writing confidence and reduced anxiety. In addition, the chatbot's ease of use and accessibility were rated highly, suggesting that its user-friendly interface facilitated engagement in the writing process. Nevertheless, several challenges emerged. AI-related issues included output that exceeded learners' language proficiency levels, limited explanatory feedback, and occasional communication difficulties. Student-related challenges involved an over-reliance on the chatbot, diminished learner autonomy, and difficulties in critically evaluating AI-generated feedback. To mitigate these issues, the study recommends explicit instruction in effective prompt formulation, the adoption of blended feedback models that integrate AI-generated and teacher-provided feedback, and pedagogical activities designed to foster learner autonomy and critical engagement with AI support. Despite certain limitations—such as reliance on self-reported data and the absence of longitudinal analysis—this study underscores the potential of Gemini as a supportive tool in EFL academic writing instruction. Future research should examine its long-term effects, explore optimal combinations of AI and teacher feedback, and investigate the applicability of AI-assisted writing tools across diverse educational contexts.

Keywords. students' perspectives, EFL students, academic writing, AI chatbots

1. Introduction

Artificial intelligence (AI) has become a transformative force in education, offering tools and resources that enhance the learning experience. Among these, generative AI (GenAI) has gained significant attention for its ability to assist students in academic writing. GenAI refers to algorithms capable of generating content, refining responses based on user needs, and simulating human intelligence through natural language interactions (Choudhurri, 2023; Ng et al., 2021). These systems, including Gemini, serve as interactive writing tools designed to support learners at various stages of the writing process, such as brainstorming, drafting, revising, and editing. Gemini, in particular, offers personalized feedback and suggestions that aim to improve the writing skills of English as a Foreign Language (EFL) students, who often encounter unique challenges in academic writing.

AI-powered tools offer numerous advantages for language learners in EFL academic writing. They provide a dynamic and interactive environment, helping students generate ideas, improve vocabulary and grammar, and refine their writing through automated feedback and proofreading (Dale & Viethen, 2021; Rowland, 2023). This flexibility allows students to learn at their own pace, adjusting to their individual needs and proficiency levels (Chen et al., 2021). Furthermore, GenAI addresses the persistent issue of limited instructional time by offering instant, accessible feedback, thereby creating more opportunities for practice and revision (Gupta et al., 2022).

Despite these benefits, several challenges accompany the use of AI in academic writing. These include the accuracy and reliability of generated content, potential over-reliance on AI tools, and concerns about intellectual property and plagiarism (Lund & Wang, 2023; Ray, 2023). AI systems may occasionally produce “hallucinated” information that appears plausible but is inaccurate or misleading (Halaweh, 2023). Additionally, students may struggle to critically evaluate feedback and rely too heavily on automated suggestions, potentially limiting the development of essential writing and critical thinking skills (Lo, 2023). Furthermore, the lack of clear instructional guidelines and training for both teachers and students can exacerbate these issues, making effective integration of AI tools into classrooms a challenge (Shin, 2023).

Academic writing is a multifaceted process requiring the coordination of cognitive skills, linguistic proficiency, and critical thinking (Allen & McNamara, 2017). For EFL learners, this process is further complicated by language barriers and limited access to individualized feedback (Aldabbus & Almansouri, 2022). While theoretical models of second-language (L2) writing emphasize the importance of iterative revisions based on feedback, practical constraints such as insufficient classroom time and students’ limited background knowledge often hinder

their progress (Kwon & Kim, 2023). Among different AI chatbots, Gemini holds promise as a tool that can provide timely feedback and help bridge these gaps. It offers personalized feedback and suggestions that aim to improve the writing skills of English as a Foreign Language (EFL) students, who often encounter unique challenges in academic writing. However, there remains a lack of empirical research on its implementation in real-world classrooms, particularly regarding how EFL learners interact with the platform and interpret its feedback. Therefore, understanding students' experiences with Gemini is essential for evaluating its effectiveness as a language learning tool and addressing any challenges they face.

The purpose of this study, therefore, is to explore how Vietnamese EFL university students perceive the use of Gemini for writing assignments in academic writing courses. Specifically, the study aims to examine the potential benefits and challenges of integrating Gemini into the EFL writing process. By investigating students' experiences and perceptions of Gemini, this study seeks to illuminate how the platform can support EFL learners in overcoming these challenges and enhancing their writing skills. Ultimately, this research aims to provide insights into the effective integration of AI tools like Gemini in language education.

2. Literature Review

2.1. The significance of GenAI in language education

Over the past few decades, technological advancements have significantly transformed the teaching and learning of foreign languages (Kessler, 2018). According to Shadiev and Yang (2020), technologies such as language learning software, online courses, and interactive applications have provided learners with more accessible, engaging, and personalized educational experiences. These innovations have allowed students to have more opportunities to practice language skills, receive immediate automatic feedback, and access a vast array of online learning resources suited to their specific needs (Ahmadi, 2018).

In recent years, GenAI has emerged as a powerful category of AI technologies capable of producing novel text, images, audio, and other types of content. These tools rely on advanced computational techniques—most notably neural networks and deep learning—to generate outputs that can closely resemble human-created material (Radford et al., 2019). By identifying patterns in large datasets drawn from sources such as books, online articles, and websites, GenAI systems are able to produce new, and contextually relevant content (Kurtz et al., 2024). Their capacity to analyze extensive amounts of information and derive meaningful insights offers notable benefits, including the ability to manage large-scale data efficiently and complete tasks with exceptional speed, thereby improving overall productivity and scalability (Nikolopoulou, 2024).

Within tertiary education, GenAI has significantly reshaped how learning materials are created, delivered, and used. It supports personalized learning opportunities and automates routine administrative duties, enhancing both the efficiency and quality of educational processes (Walter, 2024). For instance, GenAI-powered tools can adapt instructional materials to suit individual learners, provide tailored learning pathways, and deliver instant feedback, contributing to more engaging and effective learning experiences (Chan & Hu, 2023). Current research highlights the growing integration of GenAI in universities and its substantial potential to transform instructional practices (Chan & Hu, 2023; Gill et al., 2024; Nikolopoulou, 2024). Among the many uses of GenAI, AI chatbots—conversational systems built on large language models (LLMs)—have gained particular attention for their promise in supporting teaching and learning (Labadze et al., 2023).

2.2. The integration of AI chatbots in language learning

2.2.1. Definition and features of AI chatbots

AI chatbots are sophisticated software tools that employ natural language processing (NLP) to conduct conversations that resemble human interaction (Gill et al., 2024). They can interpret user input and deliver immediate, context-relevant responses, offering real-time guidance and information (Hew et al., 2023). With ongoing technological progress, chatbots have become more intuitive, natural, and accessible, broadening their applicability across multiple sectors, including tertiary education (Zawacki-Richter et al., 2019).

Within university settings, AI chatbots are increasingly embedded into educational platforms to facilitate meaningful, context-sensitive engagement with learners (Chan & Hu, 2023). These systems personalize learning by adapting content to students' preferences, learning styles, and pace, while also providing interactive support and instant feedback (Lee et al., 2022). Frequently described as virtual teaching assistants, chatbots help students with academic tasks, respond to inquiries, and clarify difficult concepts (Ding et al., 2023; Labadze et al., 2023). Their use also reduces educators' administrative burden, enabling teachers to devote more time to higher-level instructional activities (Ding et al., 2023).

Several AI chatbots have become well known for their varied functions and capabilities. One prominent example is ChatGPT, created by OpenAI, recognized for its strong ability to generate coherent, human-like text across diverse topics, making it useful in fields such as education, customer support, and entertainment (Kostka & Toncelli, 2023). In addition, Google's AI chatbot, formerly known as Bard and now called Gemini, is designed to support natural language understanding and produce meaningful, context-sensitive interactions aimed at mirroring human conversation (Jinowat et al., 2024). In the present study, Gemini is introduced as a learning assistant for EFL students because, unlike other well-established AI chatbots, it

remains relatively new and underexplored, yet shows considerable promise for language learning applications (Barrot, 2024; Imran & Almusharraf, 2024).

2.3. Benefits and challenges of AI chatbots in language learning

A growing body of research has examined how students perceive the use of AI chatbots in their learning activities (Abbas et al., 2024; Chan & Hu, 2023; Ding et al., 2023). Overall, findings suggest that students tend to view chatbots positively, valuing their functionality and enjoying their integration into the learning process (Chan & Hu, 2023). In terms of benefits, existing research identifies a variety of ways in which students utilize AI chatbots to support language learning. These include obtaining immediate answers, receiving explanations of difficult concepts, accessing multimedia support such as images or audio, and using chatbots to summarize texts or help complete assignments (Chan & Hu, 2023). Students also rely on these tools to generate ideas, structure their thoughts, and seek feedback during the writing process (Labadze et al., 2023). Furthermore, chatbots provide valuable suggestions on language use, including sentence structure, conciseness, cohesion, clarity, grammar, and spelling across multiple revision stages (Chan & Hu, 2023).

Despite the perceived benefits, students also report concerns regarding the limitations of AI chatbots. A major challenge relates to the accuracy of chatbot-generated information, as students worry about the reliability of responses and potential misinformation (Chan & Hu, 2023). Issues surrounding data privacy and security further contribute to students' hesitations. Another challenge is the risk of over-reliance on AI. Ding et al. (2023) found that many students tend to accept chatbot responses without adequate evaluation, which can hinder the development of critical thinking skills. This highlights the need for learners to cross-check information sources and engage more actively in assessing the quality of chatbot-generated content.

Taken together, these wide-ranging applications illustrate both the versatility and effectiveness of AI chatbots in addressing learners' needs while also emphasizing the importance of addressing the associated challenges.

2.4. Applications of AI chatbots in EFL writing instruction

The functionalities of AI chatbots are particularly valuable in supporting learners throughout the various stages of the writing process. Writing remains a central skill for EFL students, as it is crucial for effective communication, academic performance, and participation in academic discourse (Punar Özçelik & Yangi Ekşi, 2024). In foreign language contexts, developing writing proficiency not only strengthens linguistic competence but also cultivates critical thinking, analytical reasoning, and the ability to construct coherent arguments. Among

different writing genres, academic essay writing is especially important for EFL learners because it requires synthesizing information, presenting evidence-based arguments, and adhering to formal conventions—skills that are essential for success in higher education and professional environments (Hawanti & Zubaydullovna, 2023).

The digitization of writing has progressively reshaped how students engage in the writing process (Zhao et al., 2024). Early technological tools such as word processors introduced features for spelling and grammar correction (Cummings et al., 2024), and subsequent applications like Grammarly and Wordtune expanded automated text-editing capabilities (Jen & Salam, 2024). While these tools assist with surface-level revisions, AI-based chatbots provide an additional layer of interactive and adaptive support that can address multiple dimensions of academic writing (Ding et al., 2023).

Recent research demonstrates the diverse applications of AI chatbots in EFL writing instruction, including—but not limited to—academic essay writing. Pitychoutis (2024), in a systematic review specifically focusing on AI chatbots in academic essay writing, highlights their capacity to deliver personalized, real-time feedback on grammar, vocabulary use, coherence, and sentence structure. Such instant guidance enables students to identify errors quickly and refine their writing continuously. In the same vein, other studies explore broader applications of chatbots in EFL writing beyond academic essays. For example, Guo and Li (2024) examined undergraduate students in China who created customized chatbots using platforms like Poe to support their writing development. Their findings indicate that chatbots assist with idea generation, outlining, and correcting linguistic errors—skills applicable across various writing tasks, including essays. Similarly, Jinowat et al. (2024) investigated the use of AI chatbots combined with collaborative writing platforms in Thailand. Although not limited to essay writing, their study shows substantial improvements in students' content organization and overall writing quality, as chatbots helped learners structure ideas more effectively.

In addition, AI chatbots also contribute to affective and motivational aspects of EFL writing. They can create a low-pressure environment for language practice, helping to reduce students' anxiety and writing apprehension (Hawanti & Zubaydullovna, 2023). This supportive environment fosters clearer writing goals, increased confidence, and more positive attitudes toward writing (Pitychoutis, 2024). Furthermore, research also points to the role of AI chatbots in promoting learner autonomy and self-regulation. In a U.S. context, Wang (2025) studied how 384 students used ChatGPT to support self-directed writing development. Although the study was not confined to EFL essay writing, the findings reveal that most learners took substantial responsibility for their learning, critically evaluated chatbot-generated information, and used the tool to strengthen their independent writing processes.

Overall, these studies illustrate that AI chatbots are applied in EFL writing instruction in multiple ways—ranging from academic essay support to general writing development, idea organization, affective support, and self-regulated learning. This demonstrates that chatbots are not limited to one genre of writing but serve as versatile tools that enhance various aspects of EFL learners' writing proficiency.

2.5. Potentials and Issues of Google Gemini in Writing

Users can access Google Gemini by visiting its official website and signing in with their Google account. The tool works smoothly on common web browsers such as Safari and Chrome. After entering a prompt into the text box, users simply click the "Proceed" button to generate a response. The *Gemini* mobile app is also available on the Google Play Store for Android devices, allowing users to interact with the tool through typed input, voice commands via the microphone icon, or uploaded images. With these features, writers can use Google Gemini to brainstorm ideas, draft and revise texts, check grammar and clarity, and translate content into various languages.

Google Gemini offers notable advantages for developing writing skills due to its efficiency, support for critical thinking, and collaborative capabilities. First, it helps writers create and refine academic content more quickly and effectively (Barrot, 2025; Imran & Almusharraf, 2024; Obaidoon & Wei, 2024). By reducing the time needed for drafting and editing, the tool contributes to improving text quality. Its automated feedback—addressing aspects such as grammar, coherence, and argument strength—also enables writers to recognize both strong points and areas that need improvement (Obaidoon & Wei, 2024). Second, the tool can deepen writers' critical thinking, especially in essay writing, by suggesting ways to structure arguments, organize ideas, identify reasoning flaws, and consider different perspectives (Barrot, 2025; Wu & Xu, 2025). Finally, when paired with Google Docs, Gemini supports synchronous, real-time collaboration, allowing multiple users to compose and revise documents together (Jinowat et al., 2024). This integrated feature promotes a collective writing process, encourages timely exchanges of feedback, improves group productivity across time zones, and ensures that AI-generated suggestions are instantly visible to all team members.

However, several limitations of Gemini should also be taken into account. The model may encounter difficulties with highly technical or complex content, which can lead to inaccurate or overly simplified responses (AlSagri et al., 2024). Ethical concerns related to authorship, plagiarism, and academic honesty also arise when using AI-generated text (AlSagri et al., 2024; Barrot, 2025). Moreover, despite its usefulness in drafting and revising academic work, there remains a risk that writers may become overly dependent on AI-generated recommendations or feedback.

2.6 Research Gaps

Among current AI chatbots, Google Gemini (formerly known as Bard) is widely recognized for its capacity to support efficient and collaborative academic writing. Gemini offers features that streamline key stages of the writing process—such as drafting, revising, and editing—while enhancing clarity, coherence, and argumentative structure (AlSagri et al., 2024; Barrot, 2025; Jinowat et al., 2024; Obaidoon & Wei, 2024). Despite these advantages, concerns have been raised about users' overreliance on AI-generated content as well as ethical and literacy-related challenges associated with its use (AlSagri et al., 2024; Barrot, 2025). Given these mixed perspectives, it is essential to examine both the perceived benefits and the potential limitations of using Gemini in essay writing so that learners can engage with the tool more effectively.

In addition, although AI chatbots have demonstrated considerable potential to support the writing processes of tertiary education students, research specifically examining Google Gemini remains scarce (Barrot, 2025; Imran & Almusharraf, 2024). Existing studies have largely focused on more established tools such as ChatGPT or Bing AI, leaving a notable gap in understanding how learners engage with Gemini in EFL academic writing contexts. In particular, little is known about students' perceptions of the benefits and challenges of using Gemini. To address this gap, the present study investigates EFL students' experiences with Google Gemini during their academic writing tasks. This research is guided by the following questions:

1. What perceived benefits do EFL students identify when using Gemini AI chatbot in academic writing?
2. What challenges do students encounter when using Gemini AI chatbot in academic writing?

By exploring learners' perceptions in an area that has received limited empirical attention, this study aims to provide new insights for educators and instructional designers seeking to effectively integrate generative AI—particularly Google Gemini—into academic writing support in EFL settings.

3. Methodology

3.1. Background and participant information

Data for this study were collected during the second semester of the 2023-24 academic year. The participants were 170 EFL learners (18 males, 152 females) attending a four-year BA program in a Vietnamese university. They were Vietnamese, aged 19 to 23, and enrolled in a compulsory writing course for second-year students. These students were English majors from

the English Department, with estimated intermediate English proficiency levels. No participant had previously received formal or informal training on using chatbots for language learning. All participants had smartphones for downloading and using Gemini in classrooms. Nearly a half of the participants may have used Gemini before but never for educational purposes.

One of the primary activities in the writing course was to spend approximately 40 minutes independently writing an essay in the classroom after completing each textbook lesson. Students subsequently submitted their writings to the university Learning Management System (LMS) for evaluation. Oral or written feedback from the instructor was provided for students online or in person upon request.

For ethical reasons, participants were assigned pseudonyms (L1 to L170) to protect their identities. Learners were assured that the results, particularly the interview data, would remain strictly confidential and be used solely for research purposes. Participation in the study was entirely voluntary, and learners could withdraw at any stage without any consequences.

3.2. The training intervention and procedure

This study implemented a blended-training session over 15 weeks within an academic semester. The training aimed to introduce students to the basic features of Gemini as an AI chatbot educational platform and useful AI chatbot prompts during their writing process, targeting three main components, including (1) key features of Gemini, (2) AI prompts for brainstorming and generating ideas for essays, and (3) AI prompts for revising essays.

The researcher played an active role in structuring the training content, preparing instructional materials, and discussing the training design and implementation with the course instructor to ensure its alignment with course objectives. During the training, the researcher also provided ongoing assistance and technical support whenever necessary to help learners effectively engage with the Gemini AI chatbot and address any difficulties encountered.

❖ Component 1 (Week 2): Key Features of Gemini AI chatbot

Students were guided on installing Gemini AI chatbot on their devices and introduced to its core functions: creating a chatbot, typing prompts, uploading photos, using the microphone, and checking chat history. They identified key challenges in essay writing (e.g., brainstorming ideas, receiving feedback, revising drafts) to understand how Gemini could assist in areas such as content, organization, vocabulary, and grammar.

❖ Component 2 (Week 3): AI Prompts for Brainstorming and Generating Ideas

Students learned prompts to brainstorm and generate ideas during the pre-writing stage. Gemini provided supporting ideas, examples, and useful phrases, helping students overcome content generation challenges and develop well-rounded arguments.

❖ Component 3 (Week 4): AI Prompts for Revising Essays

Prompts were introduced for evaluating essays against criteria such as clarity, coherence, and logical flow. Gemini offered feedback on thesis statements, topic sentences, and grammar, along with suggestions for improvement, helping students systematically refine their drafts.

❖ Component 4 (Weeks 5-7 and weeks 10-12): Application and Practice

Over six weeks, students practiced writing opinion and cause-and-effect essays using Gemini throughout the writing process: pre-writing, drafting, revising, and editing. They utilized Gemini to brainstorm ideas, create outlines, and refine drafts based on feedback, enhancing their writing skills step by step.

Weeks 1 and 15 were designated for the course introduction and closure, providing a clear framework for the semester. Weeks 8 and 13 were allocated for the two mid-term tests, while Week 14 focused on preparation and revision for the end-of-semester test. The training consisted of two parts, including face-to-face sessions and online training via LMS. The face-to-face training lasted for 30 minutes before the writing lessons over the first 3 weeks. The online training, which included online materials and further practice, was accessible on the LMS platform.

3.3. Data collection instruments and analysis

The primary data for this research were collected at the end of the semester through a questionnaire and semi-structured interviews with 10 participants, both aimed at exploring students' experiences and perceptions of using Gemini to support their writing process. The questionnaire was developed based on the Technology Acceptance Model (TAM; Davis, 1989) and adapted to the context of AI-assisted EFL academic writing. To ensure clarity and accurate comprehension, the instrument was administered in Vietnamese, the participants' first language. The final version of the questionnaire was created using Google Forms and comprised two main sections. The first section elicited demographic and background information, including gender, academic major, self-reported English proficiency, and digital literacy. The second section focused on students' perceptions of and experiences with the Gemini chatbot and was divided into two subsections. The first subsection examined students' perceptions of the tool in terms of perceived usefulness, perceived ease of use, and continuance intention, and included 18 items rated on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree), along with one open-ended question. The second subsection addressed perceived challenges associated with chatbot use and consisted of seven 5-point Likert-scale items and one open-ended question. The questionnaire was administered at the end of the semester, with the survey link distributed to students both online and offline. Participation was voluntary and anonymous, and no identifying information was collected. Students completed

the questionnaire independently, without the instructor's presence, to minimize potential response bias.

In addition to the questionnaire, semi-structured interviews were conducted with 10 participants at the end of the training. The purpose of the interviews was to obtain in-depth qualitative data and to support and enrich the quantitative findings from the questionnaire. Each interview consisted of 10 open-ended questions designed to explore students' detailed experiences, perceptions, and challenges when using Gemini in their writing process. The interviews were conducted in Vietnamese, the participants' native language, to facilitate natural expression and ensure accurate data collection. For confidentiality and clarity in data presentation, interview participants were coded as S1 to S10.

Responses to the survey were automatically saved and exported to an Excel file for analysis. Descriptive statistics were applied to analyze the Likert-scale responses, while qualitative analysis was conducted on the two open-ended questions—one from the perceived benefits section and one from the perceived difficulties section. Responses to these open-ended questions were first reviewed, categorized, and counted for frequency to identify common themes. Each researcher independently coded the data based on meaning, then compared coding results to ensure consistency and accuracy. The codes were subsequently grouped into broader categories to represent key patterns and insights.

The interview data were used to complement and support the quantitative findings by providing deeper insights into students' experiences and perceptions. Direct quotations from the interviews were included where appropriate to illustrate participants' views and strengthen the interpretation of results.

4. Findings

4.1. Perceived benefits of AI chatbots in academic writing for EFL students

The results presented in Table 1 highlight the perceived usefulness of the Gemini AI chatbot, which can be categorized into two primary areas, including students' increased writing performance and affective domain during the writing process.

To further address Research Question 1, data from both the open-ended responses and semi-structured interviews were analyzed and coded using pseudonyms. The qualitative analysis revealed two major themes of perceived benefits of AI chatbots in academic writing, including the cognitive domain and the affective domain (see Table 2). A total of 83 responses were obtained from the 170 participants, with 58 responses categorized under the cognitive domain and 25 under the affective domain. Some participants provided multiple responses, while others left the questions unanswered. These responses were drawn exclusively from

participants who provided answers to the open-ended questions and from reflections shared during the interviews.

Table 1. Students' perceived usefulness

Items	Mean	SD
5-point Likert-scale questions (<i>1=strongly disagree; 5=strongly agree</i>)	(<i>Max=5;</i> <i>Min=1</i>)	
1. Gemini helps me effectively organize my essays.	4.19	0.63
2. Gemini provides me with a variety of ideas to include in my essays.	4.34	0.66
3. Gemini comprehensively improves my writing skills.	3.87	0.82
4. Gemini offers valuable feedback to help me improve my essays.	4.16	0.66
5. Gemini provides prompt feedback to help me enhance my essays.	4.19	0.76
6. Gemini helps me write essays more confidently.	4.01	0.73
7. Gemini improves my use of grammatical structures in essay writing.	3.94	0.82
8. Gemini provides me with useful vocabulary and phrases for essay writing.	4.27	0.69
9. Gemini enhances my self-learning ability in writing skills.	3.98	0.79
10. Gemini provides me with sample essays to better understand the required essay formats.	4.03	0.73

4.1.1. Cognitive domain

According to quantitative data (See Table 1), students reported significant benefits of Gemini AI chatbot in enhancing their writing performance. Among the key strengths, the chatbot's ability to provide a variety of ideas for inclusion in essays received the highest mean score of 4.34 (SD = 0.66), underscoring its strong role in fostering ideation during the pre-writing stage. Furthermore, its ability to provide sample essays in planning stage to help students understand essay formats (M = 4.03, SD = 0.73) was recognized as a valuable but less impactful resource compared to the aspect of idea generation.

These findings were supported by qualitative data collected from open-ended questions in the survey, where students frequently emphasized the enhancement of ideation of using Gemini. Specifically, 12 responses (20%) highlighted that Gemini's suggestions helped them

overcome challenges associated with limited background knowledge on complex topics. This finding aligns with the high quantitative ratings for Gemini AI chatbot's ideation capabilities, showing its strong role in reducing the cognitive load during the pre-writing stage.

In addition, quantitative data showed that Gemini AI chatbot's provision of useful vocabulary and phrases for essay writing was highly rated ($M = 4.27$, $SD = 0.69$), highlighting its effectiveness in enriching students' lexical choices. Gemini AI chatbot also demonstrated effectiveness in helping students organize their essays, with a mean score of 4.19 ($SD = 0.63$), reflecting its ability to provide structural clarity during the drafting process. In contrast, Gemini's contribution to grammatical accuracy received a moderately high score ($M = 3.94$, $SD = 0.82$), indicating a less pronounced impact compared to its strengths in idea generation and vocabulary enhancement.

These results were echoed in qualitative responses (See Table 2), where students frequently praised Gemini for enriching their vocabulary with 23 mentions (40%), suggesting *"more appropriate words,"* (S9, Interviews) and introducing *"new and useful words and phrases according to the topics"* (S2, Interviews). Moreover, students highlighted Gemini's ability to improve paragraph flow and coherence, which received 16 mentions (28%). By reviewing its suggestions for logical sequencing and the inclusion of linking words, they were able to create more cohesive essays, which reinforced the quantitative findings on organizational support. However, grammar improvement ($M = 3.94$, $SD = 0.82$) received moderate ratings in the quantitative data with 7 mentions (12%), a sentiment reflected in qualitative feedback. While students appreciated Gemini's accuracy in detecting errors, they expressed a need for more detailed explanations to enhance their understanding of grammatical rules.

Table 2. Benefits of using Gemini AI Chatbot during the writing process

Themes			Mentioned N (%)
T1. Cognitive Domain		Enhancing topic knowledge	12 (20%)
		Enhancing lexical choices	23 (40%)
		Enhancing essay logical consequence	16 (28%)
		Enhancing grammatical accuracy	7 (12%)
		Total	58 (100%)
T2. Affective Domain		Increased writing confidence	11 (44%)
		Increased writing motivation	9 (36%)
		Increased self-directive learning	5 (20%)
		Total	25 (100%)

4.1.2. Affective domain

Regarding students' attitudes and affective responses, Gemini AI chatbots contributed positively but moderately. Its ability to enhance students' confidence in essay writing ($M = 4.01$, $SD = 0.73$) and promote self-learning ($M = 3.98$, $SD = 0.79$) were rated lower than its contributions to cognitive domains like ideation and vocabulary. These findings suggest that while Gemini encourages autonomy and reduces anxiety, its impact on building self-directed learning and confidence is comparatively less significant.

Supported by qualitative data, many students in the interviews shared that Gemini's immediate feedback and visible improvements in their essays boosted their confidence and reduced anxiety during the writing process with 14 mentions (44%). However, the chatbots' ability to promote self-learning was seen as somewhat limited with 5 mentions (20%). It was shared in the semi-structured interviews, while students recognized patterns in their errors and gained some autonomy, they highlighted the lack of step-by-step explanations or deeper insights into the corrections provided by Gemini. This aligns with the moderate quantitative scores, suggesting that while Gemini AI chatbot encourages surface-level improvements, it could do more to foster critical reflection and deeper learning (See Table 2).

4.1.3. Ease of use

As described in Table 3, students rated Gemini AI chatbot highly for its user-friendly layout ($M = 4.28$, $SD = 0.76$) and ease of access during the essay-writing process ($M = 4.27$, $SD = 0.69$). These high scores suggest that Gemini AI chatbot's interface design and accessibility features are well-received, enabling students to engage with the chatbot efficiently. The ease of access aligns with qualitative findings, where students frequently mentioned the convenience of using Gemini AI chatbot anytime and anywhere, describing it as "*user-friendly*" (S5, Interviews) and "*hassle-free*" (S8, Interviews).

Table 3. Students' perceived ease of use

Items	Mean	SD
5-point Likert-scale questions (<i>1=strongly disagree; 5=strongly agree</i>) (<i>Max=5; Min=1</i>)		
1. I find Gemini's layout user-friendly.	4.28	0.76
2. I find it easy to learn how to use Gemini for essay writing.	3.89	0.71
3. I can easily access Gemini to use during the essay-writing process.	4.27	0.69
4. I can easily find instructions on how to use Gemini.	4.13	0.76

5. I find it easy to interact with Gemini by giving it prompts to get what I need. 3.52 0.80

While students found it relatively easy to learn how to use Gemini AI chatbot for essay writing ($M = 3.89$, $SD = 0.71$), the slightly lower score compared to layout and accessibility suggests that initial onboarding or guidance could be further enhanced. Similarly, the ease of finding instructions on using Gemini AI chatbot ($M = 4.13$, $SD = 0.76$) received positive but not exceptional ratings, indicating that while instructions are generally accessible, they might lack detail or clarity in certain areas.

The lowest-rated item was ease of interacting with Gemini AI chatbot by giving it prompts ($M = 3.52$, $SD = 0.80$). This suggests that some students may face challenges in phrasing prompts effectively to obtain the desired responses. This aligns with qualitative feedback where students expressed occasional frustration with the chatbots' responses, noting that it sometimes misunderstood their inputs or required multiple attempts to clarify prompts. For example, one student commented, *"I often had to rephrase my question two or three times because Gemini didn't understand what I meant the first time."*

4.1.4. Continuance intention

As can be seen Table 4, the highest-rated item (Statement 1), *"I plan to continue using Gemini to improve my writing skills in the future."* ($M = 4.36$, $SD = 0.60$), demonstrates students' strong intention to make Gemini an integral tool in their writing journey. This indicates high satisfaction with its perceived benefits, such as idea generation, organizational support, and feedback provision, as mentioned above.

Table 4. Students' continuance intention

Items	Mean	SD
5-point Likert-scale questions (1=strongly disagree; 5=strongly agree)	(Max=5; Min=1)	
1. I plan to continue using Gemini to improve my writing skills in the future.	4.36	0.60
2. I will keep exploring how to use Gemini to support my writing skills more effectively in the future.	4.19	0.64
3. I intend to practice using Gemini regularly to enhance my writing skills in the future.	4.10	0.72
4. I will use Gemini as an important part of my writing study strategy.	4.01	0.79

Similarly, the statement *"I will keep exploring how to use Gemini to support my writing skills more effectively in the future"* (Statement 2) received a mean score of 4.19 (SD = 0.64), showing students' willingness to further develop their understanding of the chatbot's capabilities. Qualitative responses align with this finding, where students expressed curiosity about exploring more advanced features of Gemini AI chatbot to maximize its usefulness.

Students expressed moderate levels of commitment to practicing with Gemini regularly (M = 4.10, SD = 0.72) and using it as an important part of their writing study strategy (M = 4.01, SD = 0.79). While the scores are positive, they reflect a slightly lower enthusiasm for integrating Gemini AI chatbot into their routine practices. Interviews and open-ended questionnaire responses revealed that some students perceived the chatbots as a supplementary tool rather than a primary one, citing the need for additional teacher support or more detailed feedback to complement Gemini AI chatbot's features. One student noted, *"Gemini is helpful, but I still need my teacher to explain things more clearly and check my writing carefully."* (S1, Interviews)

4.2. Students' perceived challenges in Gemini-assisted academic writing

While students generally had positive experiences with Gemini AI chatbot, they also faced notable challenges that can be grouped into two main aspects: AI-related and student-related issues. These challenges were reflected in both quantitative and qualitative data, providing a holistic view of the difficulties encountered.

To further address Research Question 2, similar procedures were followed as in the analysis for Research Question 1. Data from the open-ended responses and semi-structured interviews were coded using pseudonyms, and the qualitative analysis identified two major themes regarding the perceived challenges of using AI chatbots in academic writing: AI-related difficulties and student-related difficulties (see Table 6). A total of 111 responses were collected from the 170 participants, with 60 responses categorized under AI-related difficulties and 51 under student-related difficulties.

4.2.1. AI-Related challenges

Quantitative data revealed that a significant number of students found Gemini's language too advanced for their current level (M = 4.34, SD = 0.78). This issue was corroborated by qualitative responses (See Table 6), where students reported that the vocabulary suggested by Gemini AI chatbot was often beyond their proficiency level with 29 mentions (47%). For example, one interviewee described having to search for simpler alternatives to the words provided, highlighting a gap between the chatbots' output and students' linguistic capabilities (S3, Interviews).

Table 5. Students' challenges in using Gemini AI chatbot

Items	Mean	SD
5-point Likert-scale questions (1=strongly disagree; 5=strongly agree)	(Max=5; Min=1)	
1. I don't know how to give effective commands to Gemini.	3.92	0.85
2. I find it difficult to accurately evaluate the information provided by Gemini.	3.54	0.73
3. I rely too much on Gemini to support my writing skills.	3.78	0.76
4. I haven't been given clear instructions on how to use Gemini.	2.91	0.99
5. Gemini's language is too advanced for my current level.	4.34	0.78
6. Gemini's feedback on my writing is too general.	2.45	0.67
7. Using Gemini reduces my autonomy in learning writing skills.	3.31	0.89

According to Table 6, students also expressed dissatisfaction with the lack of automatic explanations for Gemini's corrections with 17 mentions (28%). For instance, one student remarked, "*The reason for the correction was normally unknown*," (S3, Interviews) making it challenging to understand why their original sentences were considered incorrect. This aligns with the lower score for perceived ease of evaluating Gemini AI chatbot's feedback ($M = 3.54$, $SD = 0.73$), suggesting that students struggled to critically assess and learn from the feedback provided.

Another key AI-related challenge was communication difficulties with Gemini AI chatbot, which received 12 mentions (20%). Some students reported instances where their prompts were misunderstood, leading to responses that did not align with their intentions. Quantitative data highlighted that some students felt unsure about giving effective commands to Gemini AI chatbot ($M = 3.92$, $SD = 0.85$). In the qualitative responses, one the interview students mentioned preferring to use English instead of Vietnamese to improve communication accuracy, but this added an extra layer of complexity and stress (S7, Interviews).

Table 6. Issues students face when using Gemini AI chatbot during the writing process

Themes of Barriers			Mentioned (%)	N
T1. Barriers	AI-related	Advanced language	29 (47%)	
		Lack of detailed explanation for error corrections	17 (28%)	
		Communication and misinterpretation	12 (20%)	
		Perceived loss of authorship	3 (5%)	
		Total	61 (100%)	
T2. Barriers	Student-related	Overreliance on AI	24 (48%)	
		Doubts about learning effectiveness	8 (16%)	
		Lack of prompt-formulation skills	18 (36%)	
		Total	50 (100%)	

This issue of authorship emerged in qualitative feedback, where students expressed mixed feelings about revisions that altered their writing style and structure. A small number of the students (3 mentions) noted that their revised texts often differed significantly from their original writing, causing them to feel detached from the final product. While the polished output was appreciated, the lack of alignment with their original voice left some students feeling as though the text no longer represented their work.

4.2.2. Student-related challenges

As can be seen in Table 5, quantitative data indicated a moderate level of reliance on Gemini AI chatbot ($M = 3.78$, $SD = 0.76$), with some students expressing concerns about losing autonomy in their learning process ($M = 3.31$, $SD = 0.89$). Qualitative feedback further revealed that students often felt compelled to accept Gemini AI chatbot's feedback without critically evaluating it, especially when they lacked the knowledge to assess its accuracy with 24 mentions (48%). This reliance was exacerbated by a preference for face-to-face feedback from instructors, which students found more engaging and easier to comprehend.

Several students questioned whether interacting with Gemini AI chatbot genuinely contributed to their English learning with 8 mentions (16%). This was reflected in the qualitative data, where students compared the chatbot's feedback to that of their instructors. They noted that the lack of interactive, real-time clarification made it harder to fully grasp feedback, leading to doubts about its effectiveness.

Students reported difficulties in crafting effective prompts for Gemini, as reflected in the quantitative data ($M = 3.92$, $SD = 0.85$). Qualitative responses highlighted that students often struggled to convey their needs clearly with 18 mentions (36%), which occasionally resulted in responses that were not aligned with their expectations. This challenge underscores the need for training in effective prompt formulation to maximize the tool's potential.

5. Discussions and pedagogical implications

The results of this study highlight the perceived benefits and challenges of using the Gemini AI chatbot to assist EFL students in academic writing. Overall, students reported positive experiences with this chatbot, particularly in terms of cognitive support, writing performance improvement, and ease of use. However, certain limitations emerged, particularly in the affective domain and in the effectiveness of the tool's feedback mechanisms. These findings provide valuable insights into the potential of AI-assisted writing tools for EFL students.

5.1. Cognitive domain: strengths and areas for improvement

One key finding of this study is the strong perceived benefit of Gemini AI chatbot in enhancing students' cognitive performance, particularly during the pre-writing stage. Among the features explored, the chatbot's ability to generate a wide range of ideas received the highest ratings, highlighting its value in supporting brainstorming and helping students overcome difficulties related to limited background knowledge. This aligns with prior studies emphasizing how AI tools can lessen cognitive load by assisting learners in generating ideas, organizing their thinking, and deepening their understanding of complex topics (Bok & Cho, 2023; Kim et al., 2024; Usher & Amazalag, 2025). In addition, students noted the usefulness of Gemini's vocabulary suggestions, phrase options, and organizational guidance, all of which contributed to strengthening their lexical choices and improving the overall structure of their essays. These results echo earlier research showing that AI-based tools can enhance clarity, coherence, and linguistic accuracy in writing (Gayed et al., 2022). The varied ways students used the chatbot in this study further illustrate its capacity to support multiple dimensions of academic writing—from foundational tasks such as idea generation to more advanced processes like writing consultation (Nguyen et al., 2024; Wang, 2025; Zhao et al., 2024).

Despite these advantages, the findings also reveal certain limitations, particularly regarding grammar support. Grammar improvement received lower ratings compared with other cognitive features. While students recognized that Gemini AI chatbot could identify errors effectively, many indicated that the feedback lacked sufficient explanation to help them understand the corrections. This suggests that although this chatbot can detect grammatical issues, its ability to provide instructional, explanatory feedback remains limited. Enhancing this

aspect of the tool could strengthen its role in promoting deeper learning and supporting students' long-term language development. These challenges may be partly associated with students' AI literacy, which involves understanding how AI chatbots work, what they can and cannot do, and how to interact with them effectively (Ding et al., 2023; Nikolopoulou, 2024). AI literacy moves beyond simple operational skills to include knowledge of how to elicit more detailed grammatical explanations, which is essential for fostering meaningful learning through AI-assisted writing support.

5.2. Affective domain: confidence building and self-learning

In the affective domain, students reported moderate benefits from Gemini AI chatbot in terms of boosting their confidence and moderately promoting self-learning. While the chatbot's immediate feedback and visible improvements in students' essays were appreciated, its impact on building self-directed learning was more limited. Students expressed that although they were able to recognize patterns in their errors, they missed step-by-step explanations and deeper insights into the reasons behind corrections. This reflects the findings of previous research, which suggests that AI tools can provide surface-level improvements but may lack the depth necessary to foster critical thinking and reflective learning (Lee et al., 2023). While Gemini AI chatbot provides valuable support in drafting and revising writing work, writers must be cautious of over-relying on AI-generated suggestions, as this may result in writing that is generic, formulaic, and lacking in creativity (AlSagari et al., 2024; Barrot, 2025). This risk is especially pronounced when users accept AI feedback uncritically without engaging in deeper reflection or revision.

To enhance the affective benefits of Gemini, teachers should guide students in critically evaluating and selectively incorporating AI-generated feedback. Such guidance helps ensure that students do not rely on the tool merely for surface corrections but instead use it as a foundation for deeper reflection and more meaningful revision (Barrot, 2025; Jinowat et al., 2024). In doing so, teachers can position Gemini AI chatbot not only as a tool for idea generation and grammar support but also as an interactive writing assistant that promotes autonomy and metacognitive growth (Wu & Xu, 2025). For example, teachers may encourage students to generate multiple drafts with Gemini and compare the AI's suggestions with their original work, discussing which revisions improve elements such as content, organization, vocabulary, or grammar—and why. This comparative process allows students to better understand writing criteria while aligning revisions with their personal goals. Additionally, Gemini AI chatbot's conversational interface enables students to request explanations for the feedback it provides, further strengthening their metacognitive awareness and ability to reflect on their learning.

5.3. Integrating Gemini AI chatbot for writing: Ease of use versus students AI literacy

The students' feedback regarding the ease of use of Gemini AI chatbot was generally positive, with high ratings for its user-friendly layout and ease of access during the writing process. These findings suggest that the chatbot's interface is intuitive and well-designed, enabling students to engage with the tool efficiently. However, challenges were reported in the areas of learning how to use Gemini and interacting with prompts.

Despite students' generally positive perceptions of Gemini's ease of use, several challenges related to the tool's performance emerged. A prominent concern was that Gemini AI chatbot often generated language that exceeded students' proficiency levels. Many learners reported needing to simplify the vocabulary suggested by the chatbot, which underscores a misalignment between the tool's output and users' linguistic abilities. This highlights the importance of designing AI tools that can adapt to varied proficiency levels and provide more context-sensitive, level-appropriate feedback. Another significant challenge stemmed from student-related factors, particularly overreliance on Gemini and difficulties in formulating effective prompts. Many students felt inclined to accept chatbot's suggestions without critically evaluating them, raising concerns about reduced autonomy in the learning process. This tendency was compounded by limited skills in critical synthesis and advanced analytical thinking—abilities that some learners may find inherently challenging (Ferrari, 2001).

In addition, students frequently struggled to construct clear and precise prompts, which occasionally led to irrelevant or misaligned responses from the tool (Ding et al., 2023). These findings indicate that enhancing students' capacity to use Gemini effectively requires not only technical improvements to the tool but also targeted training in prompt formulation and critical evaluation of AI-generated feedback. Developing these skills would promote more autonomous, reflective, and meaningful engagement with the chatbot. This underscores the broader importance of technology literacy, particularly in under-resourced educational contexts (Imran & Almusharraf, 2024). As Imran and Almusharraf (2024) point out, users with limited digital literacy may struggle to fully leverage AI tools. In contexts such as Vietnam, where AI-assisted writing tools are still in the early stages of adoption, both students and teachers may lack sufficient training and familiarity with advanced technologies. Effective use of Gemini AI chatbot therefore requires a foundational understanding of how AI systems operate, as well as competence in navigating digital platforms, interacting with text-based interfaces, and interpreting AI-generated content—skills that should be explicitly supported through training initiatives.

5.4. Continuance intention: Willingness to use Gemini AI chatbot in the future

With respect to students' continuance intention, the findings reveal a strong willingness to keep using Gemini AI chatbot to further develop their writing skills. This indicates high

satisfaction with the tool's perceived benefits, especially in terms of idea generation, vocabulary support, and assistance with organizing essays. Nevertheless, the slightly lower ratings related to routine use and relying on the chatbot as a central component of their writing strategies suggest that many students still perceive the chatbot as a supplementary aid rather than an essential element of their writing workflow.

Insights from interviews and open-ended responses further show that some students felt the need for greater teacher involvement and more detailed, human-delivered feedback to complement Gemini AI chatbot's automated suggestions. To encourage more consistent use of the tool, integrating Gemini within a blended feedback model or collaborative writing framework may be advantageous (Imran & Almusharraf, 2024). Such an approach allows AI-generated feedback and instructor guidance to work in tandem, promoting deeper engagement with revision and reflection. Instructors could also review students' version histories and AI-generated suggestions to monitor engagement, track responsiveness to feedback, and support collaborative decision-making. By embedding Gemini into a more interactive and pedagogically guided writing environment, the chatbot not only enhances writing instruction but also strengthens formative assessment practices that emphasize peer interaction, self-reflection, and iterative improvement (Imran & Almusharraf, 2024).

6. Conclusion

This study explored the perceived benefits, challenges of using Gemini AI Chatbot in academic writing for EFL students. Findings revealed significant perceived benefits in enhancing writing performance and supporting the cognitive domain, particularly in generating ideas, organizing essays, and enriching vocabulary. Students reported increased confidence and reduced anxiety in writing but noted moderate gains in self-directed learning and grammatical accuracy. Ease of use and accessibility were highly rated, highlighting Gemini's user-friendly interface and convenience. However, several challenges were identified. AI-related barriers included advanced language output beyond students' proficiency levels, lack of detailed feedback explanations, and communication difficulties due to ineffective prompts. Student-related barriers involved over-reliance on the Chatbot, reduced autonomy in learning, and difficulties in evaluating feedback. These findings suggest that while Gemini supports writing development, it requires complementary strategies to address these limitations.

To enhance the effectiveness of AI-assisted writing tools like Gemini, the following recommendations are proposed:

❖ **Prompt Formulation Training:** Develop workshops or instructional guides to help students craft clear and effective commands, optimizing their interactions with the chatbot.

These resources should include practical examples, common prompt templates, and exercises to practice refining queries. Collaboration with educators to design these materials can ensure alignment with curriculum goals and address specific areas where students struggle in interacting with AI systems. Additionally, incorporating multilingual support for lower-proficiency learners could further bridge the gap between AI output and student needs, fostering inclusivity.

❖ **Blended Feedback Approaches:** Combine AI-generated feedback with instructor-led guidance to ensure a balanced and comprehensive learning experience. Teachers can provide personalized feedback that addresses contextual nuances or cultural aspects of language that AI might overlook. Regular peer-review sessions, integrated with AI feedback, could also encourage collaborative learning and expose students to diverse perspectives on writing improvement.

❖ **Autonomy Building:** Design activities that encourage critical evaluation of chatbot feedback, promoting deeper learning and self-reflection. For instance, guided exercises that require students to compare and contrast AI suggestions with their original text can help them develop critical thinking skills. Providing rubrics or criteria for evaluating feedback quality will further empower students to make informed decisions about their writing revisions.

While this study provides valuable insights into the use of Gemini AI chatbot for EFL academic writing, several limitations must be acknowledged. First, the findings rely on self-reported data, which may reflect subjective perceptions rather than actual improvements in writing performance. Second, the study was conducted within a specific context, limiting the generalizability of results to other educational settings or AI tools. Third, the lack of longitudinal data means the long-term impact of using Gemini AI chatbot on writing development remains unexplored. Future research could focus on empirical evaluations of students' writing performance over time, investigate the impact of integrating AI feedback with traditional teacher feedback, and explore the effectiveness of adaptive learning features in AI-assisted writing tools. Expanding the research to diverse educational contexts would also provide broader insights into the potential of AI in language learning.

In conclusion, while Gemini AI chatbot demonstrates considerable promise as a supportive tool for academic writing, addressing both AI-related limitations and student skill gaps is crucial for optimizing its impact. A balanced approach that integrates AI's strengths with human expertise and targeted training can unlock its full potential in enhancing EFL students' writing abilities.

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