Refining EFL Essay Writing with Multimodal GenAI Tools

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ABSTRACT

This study presents a structured didactic intervention that uses multimodal Generative Artificial Intelligence (GenAI) tools to enhance English essay writing. It was implemented among 50 second- and fourth-year teacher-training students at a Chilean university. After an initial diagnostic activity, the students took part in six structured sessions that combined traditional teaching with various AI tools: ChatGPT for self-assessment, Claude for outlining, Perplexity for brainstorming, Gemini for thesis development, NotebookLM for expanding ideas, and a custom GPT for building paragraphs. Only the first session included some quantitative analysis, comparing student self-ratings with AI feedback, while the rest focused on reflections collected through online forms. A manual and AI-supported thematic analysis found that students valued quick, personalized feedback that helped them with grammar, organization, and overall clarity. Learners at lower levels used AI for basic support, whereas more advanced students used it to strengthen arguments. Some worries emerged, including becoming too dependent on AI, losing originality, and facing technical issues. Finally, the study suggests that AI can enhance writing and self-awareness when used alongside explicit instruction and training. Future research should look into improving student retention and integrating AI tasks into regular coursework.

Keywords: AI-assisted writing, dual thematic analysis, EFL pedagogy, GenAI tools.

Introduction

For more than two decades, many studies have indicated that EFL students struggle with academic writing, particularly in organizing ideas coherently and maintaining grammatical

accuracy (Fareed et al., 2016; Nguyen et al., 2024). Instructional methods and feedback practices have historically addressed these recurring composition challenges through conventional approaches. Early research identified these obstacles (Zimmerman & Risemberg, 1997; Maros et al., 2007), which persist today (Tasisa & Tadesse, 2024).

As AI becomes more relevant in educational contexts, exploring how learners interact with these technologies is essential to maximize their use in writing instruction (Li, 2021; Ci & Jiang, 2025). The emergence of diverse GenAI tools presents new opportunities for providing immediate, individualized feedback and support to enhance writing skills (Abdullayeva & Musayeva, 2023; Mahapatra, 2024). Nevertheless, this technological potential comes with pedagogical responsibilities, as educators must stay informed and be able to select suitable tools that align with their students' needs (Pokrivcakova, 2023; Pham, 2025).

Supporting this educational shift, recent research indicates that Generative Artificial Intelligence (GenAI) can effectively tackle common writing difficulties, primarily grammatical errors, structural organization, and coherence (Nguyen Minh, 2024). This evidence not only highlights GenAI's capacity to target specific writing problems but also demonstrates its potential to enrich the learning experience through real-time, adaptive feedback that actively involves students in the revision process (Xie et al., 2019; Orsi Koch Delgado et al., 2020; Tan et al., 2025; Vorobyeva et al., 2025).

Despite significant technological progress, writing remains one of the most challenging and under-addressed skills in EFL teaching. To address this ongoing problem, the present study explores how multimodal GenAI tools can be systematically integrated into EFL essay writing instruction. The intervention was implemented with 50 second- and fourth-year pre-service English pedagogy students from a public university in Valparaíso, Chile. By incorporating a range of AI assistants into a six-session writing workshop, the study aims to determine how student-teachers perceive the benefits and limitations of AI assistance at different stages of the academic EFL writing process.

Consequently, the research questions that guided this study were:

1. How do student-teachers in an ELT program perceive the benefits and limitations of AI assistance across different stages of the academic EFL writing process?

2. What are the pedagogical implications?

Literature review

Challenges in EFL essay writing

Over the years, numerous researchers have acknowledged that writing is among the most challenging skills to develop. Students encounter several obstacles, such as insufficient writing strategies (Zimmerman & Risemberg, 1997), first-language interference (Maros et al., 2007), a limited range of vocabulary (Ghabool et al., 2012), grammatical difficulties (Fareed et al.,

2016), and writing anxiety (Akhtar et al., 2020). Given these complexities, Table 1 below provides a summary that categorizes the most frequent academic essay writing errors into five main categories, describing both ideal performance and the indicators of typical mistakes in each area.

Table 1

Common errors in academic essay writing.

Category	Description	Indicator
1. Essay structure	Logical organization and development of ideas	Disconnected paragraphs and a lack of clear transitions between ideas.
2. Linguistic aspects	Correct use of grammar and vocabulary	Errors in verb tenses, agreement, and inappropriate lexical choices.
3. Coherence and cohesion	Logical connection between ideas and use of connectors	Lack of appropriate connectors, and ideas presented without a clear relationship.
4. Critical thinking	Development of arguments and analysis	Superficial arguments, lack of supporting evidence or examples.
5. Academic conventions	Adherence to academic format and style	Incorrect citations, informal register, inadequate structure.

Table 1 illustrates findings from previous investigations that have contributed to a better understanding of the issues and served as a starting point for suggesting strategies that may impact the process. For example, Alfaruqy et al. (2022) highlight the weakest areas in argumentative essay writing and underscore the need for innovative strategies that promote thorough understanding and effective error correction. Ariyanti and Fitriana (2017) note that students often struggle with cohesion and coherence in argumentative texts due to time limitations and large class sizes, which restrict teachers' ability to offer high-quality feedback. Mudau et al., (2025) reveals that first-year students struggle with academic writing because of a gap between high school preparation and university expectations, leading to poor academic performance.

Meanwhile, Al-Khulaidi and Abdulkhalek (2022) propose solutions to address common pitfalls and enhance writing proficiency in L2 academic writing. Their approach emphasises an interactive, technology-focused, and student-centered model that integrates essential skills and digital literacy. Collectively, these authors stress the importance of a step-by-step teaching methodology and explicit revision guidance to improve outcomes in the teaching-learning process.

GenAI support in developing an argumentative essay

Incorporating GenAI technologies into the essay-writing process can offer both teachers and students practical support. In addition to correcting spelling and grammar, these tools enhance overall cohesion, coherence, and clarity in written texts.

Recent studies have shown that ChatGPT offers valuable assistance to English language learners by providing corrections, immediate feedback, and revision guidance (Abdullayeva & Musayeva, 2023; Mahapatra, 2024). Similarly, Nguyen Minh (2024) notes that GenAI not only improves grammar and vocabulary but also strengthens the coherence and sophistication of arguments, demonstrating its positive influence on students' writing abilities and critical thinking skills.

One key benefit of such technologies is their capacity to deliver on-demand feedback through user prompts (Rebolledo & Gisbert, 2025). This functionality enables in-time corrections and explanations that foster interactive and engaging learning. Building on this strength, Table 2 below illustrates how a GenAI tool can provide real-time support for various writing dimensions. It offers examples of suggested prompts, the resulting enhancements, and the explanation behind each correction.

Table 2

Real-time GenAI support and real-time feedback.

Category	Prompt	GenAI feedback
Essay Structure	Evaluate and refine the structure of the given sentences.	Unnecessary commas were removed, and transitions were refined to strengthen logical organization and flow.
Linguistic Aspects	Identify and correct grammar mistakes in the paragraph and clarify the relevant rules.	Added "that" and inserted commas to enhance clarity and ensure grammatical consistency.
Coherence and Cohesion	Improve cohesion and coherence by suggesting suitable connectors or transitional words.	Introduced "Additionally" to establish smoother transitions between ideas, improving overall cohesion.
Critical Thinking	Enrich the paragraph with examples and explanations, focusing on the effective use of grammar and syntax to enhance clarity and coherence.	Changed "don't" to "doesn't" to ensure correct verb conjugation and clarify the expression of critique.
Academic Conventions	Check the text for capitalization and punctuation errors, then correct them.	Adjusted capitalization and punctuation to comply with formal academic standards.

The examples in Table 2 demonstrate that GenAI offers detailed corrections on various aspects of writing through specific prompts, providing clear explanations that enable students to understand and correct their mistakes. This real-time feedback enhances the quality of academic essays and promotes autonomous and practical learning, allowing the participants to identify and address their weaknesses promptly.

Therefore, implementing a didactic approach that uses GenAI technologies is presented as a practical and necessary pedagogical alternative to overcome common difficulties in students' written production of academic content. This proposal addresses the areas of weakness identified by the cited authors, promoting more autonomous and effective learning and allowing

students to improve their skills. At the same time, EFL student-teachers can reflect on the process and consider how to integrate AI suggestions into their essays effectively.

Multimodal GenAI tools

Multimodal Generative AI (GenAI) tools are advanced technologies that can process and integrate multiple data types, including text, images, audio, and video (Zou et al., 2025). Their ability to handle diverse inputs allows them to perform complex tasks and generate more accurate and context-aware responses compared to systems restricted to a single data modality (Imran & Almusharraf, 2024; Liu et al., 2024).

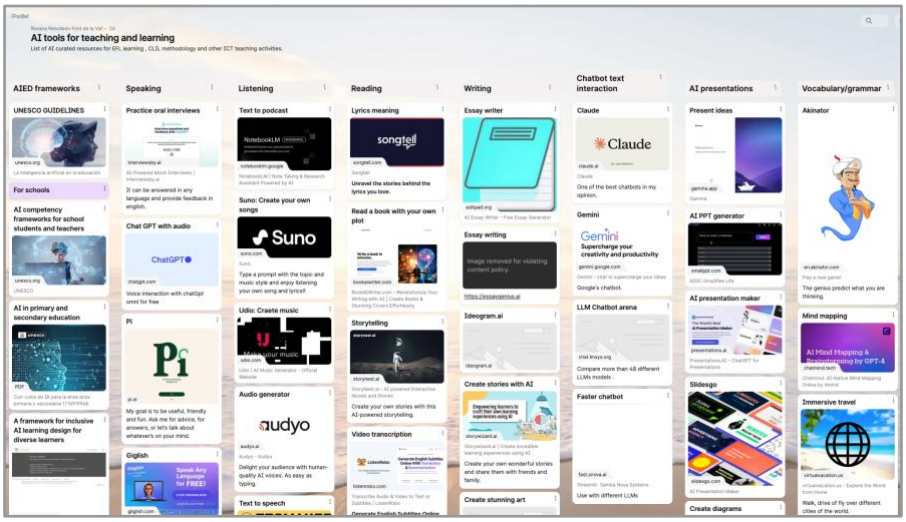
These tools include text-to-speech and speech-to-text systems, which convert spoken language into written text and vice versa. This multimodal functionality enhances interaction with AI systems, enabling users to issue voice commands or receive responses in audio format. Additionally, multimodal chatbots, which support text, voice, and image-based communication, offer a more dynamic and enriched learning experience. Visual tools like diagrams help students understand essay structure, audio features make learning more engaging and memorable, and interactive chat functions allow students to get immediate help and make quick revisions.

The emergence of these innovative tools also adds additional layers of complexity and technical challenges. As Zou et al. (2025) explain, multimodal generative AI tools can process and integrate multiple data types including text, images, audio, and video, requiring users to develop competencies across various interaction modes. While Alabduljabbar (2024) note that multimodal capabilities enhance the accuracy and contextual awareness of AI responses, they also acknowledge that these advanced functionalities can overwhelm users, particularly those less comfortable with technology.

Figure 1 presents a fragment of the "AI Tools for Teaching and Learning" board, located at https://bit.ly/iaed24. This is a Padlet-based collection of multimodal GenAI tools selected for the implementation of this study.

Figure 1

Multimodal GenAI tools for EFL teaching and learning



The multimodal GenAI tools used in this study include ChatGPT, Claude, Perplexity, Gemini, NotebookLM, and a customized GPT model, each serving a specific role in enhancing different stages of the essay writing process, such as brainstorming, research, thesis formulation, structuring, drafting, and refining through AI-generated feedback and analysis. These platforms were selected based on two criteria. First, they provide multimodal adaptive features—supporting not only text but also images, audio, or video—allowing students to interact through diverse modalities. Second, they are accessible, either free of charge or with trial versions, making them suitable for implementation in a public university setting.

Despite the promising capabilities of multimodal GenAI tools, existing studies predominantly examine isolated AI applications rather than systematic, progressive implementations across writing curricula. This study fills this gap by implementing a systematic, multimodal GenAI intervention designed specifically for pre-service EFL teachers through a structured six-session framework.

Methods

Pedagogical setting & participants

This pilot study involved 50 undergraduate students from the English Pedagogy Program at a public university in Valparaíso, Chile, enrolled in fourth-semester (intermediate) and eighth-semester (advanced) courses. The study employed convenience sampling as the primary recruitment strategy. As this is a pilot group, the researchers view these results as preliminary findings, and they do not intend them to be generally applicable.

Attendance varied significantly due to voluntary participation, with subsequent sessions showing considerable fluctuation from the initial 50 participants.

The study followed strict protocols to ensure participant anonymity and data security. To replace personal information, each participant was assigned a unique identifier (e.g., S1-S1, S2-S11, etc). Essays and responses were anonymized before analysis, and the primary researchers controlled access to raw data. Participants were informed about data collection, storage, and usage procedures through informed consent forms.

Sessions occurred in a computer lab with technological resources and instructor support for technical assistance.

Design of the study

This qualitative intervention research focused on understanding student experiences with AI tools and their impact on writing development. Session 1 included quantitative analysis comparing student self-assessments with AI-generated evaluations. The intervention gradually enhanced essay writing through AI-assisted techniques, following a process-oriented approach (Dragomir & Niculescu, 2020).

Seven sessions were implemented (one diagnostic plus six focused sessions), planned weekly from August to October 2024, but extended to December. Sessions occurred in a computer lab.

Table 3 presents the pedagogical intervention, which follows a structured six-stage process designed to integrate AI tools into English essay writing instruction.

Table 3

Objectives, methodology, activities, tools, and participants in each session.

Session	Objective	Strategy	Tools	Nº Students
0: Diagnostic test	Assess students' initial essay writing skills.	Writing an essay on a common topic to evaluate proficiency.	Google Forms	50
1: Essay self-assessment and AI feedback	Develop self-assessment skills and critical analysis.	Use of an analytical rubric for self-assessment and AI-generated feedback.	ChatGPT, Google Forms	34
2: Essay Outlining	Understand and apply academic essay structure.	Compare manually created outlines with those generated by AI.	Claude, Google Forms	31
3: AI-assisted brainstorming and prewriting	Enhance research and idea organization skills.	Use AI-powered search tools for guided research and brainstorming.	Perplexity, Google Forms	33
4: Thesis Statement Development	Strengthen thesis statement formulation skills.	Combine manual drafting with AI-assisted refinement.	Gemini, Google Forms	29
5: Deepening the thesis statement	Improve the thesis statement depth and critical thinking.	AI-assisted analysis and resource organization.	NotebookLM, Google Forms	19
6: Paragraph Construction	Develop skills for writing coherent and well-structured paragraphs.	Guided writing with AI-generated feedback.	Custom GPT, Google Forms	25

Didactic sequence

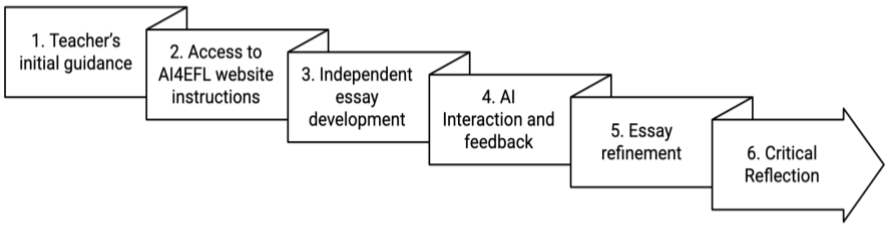
Every session followed a structured sequence: teacher guidance, independent essay development, AI interaction and feedback, essay refinement, and critical reflection. Students accessed the AI4EFL website (https://bit.ly/m/ai4efl) for step-by-step guidance.

Then, the students worked independently, developing their essays without AI assistance. During this phase, participants focused on developing their ideas, structuring their arguments, and refining their fundamental writing skills. Subsequently, students engaged in AI interaction and feedback, using different tools to analyze their work, compare structures, and receive constructive suggestions for improvement.

The last stage centered on essay refinement, where students incorporated prompts and interacted with AI systems, applying the feedback received according to their specific stage in the writing process to refine and enhance their essays. The session concluded with a critical reflection stage, during which students openly reflected on the usefulness of the intervention, evaluated the AI tool's effectiveness, and assessed their progress in writing, ultimately evaluating the overall impact on their learning experience. Figure 2 presents the structured

didactic sequence followed in each session, outlining the six key stages that guided students through the essay writing process. Each step is designed to progressively support students in enhancing their essays while effectively leveraging AI tools.

Figure 2
Didactic sequence overview



Data collection & analysis

Participants completed activities and reflections via Google Forms, with data automatically collected, including essays, self-assessments, AI feedback, and personal reflections.

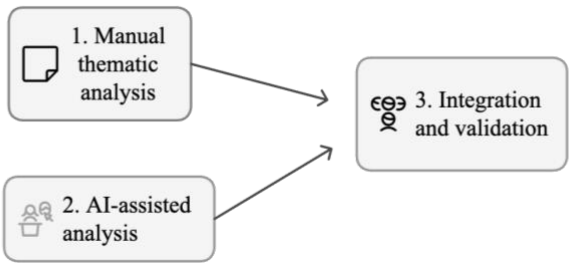
The study employed a dual thematic analysis, which consisted of conducting a manual thematic analysis of the data to be contrasted with the results obtained using an AI-generated analysis. This approach focused on identifying the key themes that emerged after each session, providing a comprehensive understanding of students' experiences.

Some studies support the benefit of researchers using AI to analyze qualitative data (Jiang et al., 2021). This dual approach enhances the study's reliability by combining human interpretive depth with AI's systematic processing capabilities. Morgan (2023) argues that AI-assisted analysis should complement human insight rather than replace it. Furthermore, this methodology aligns with Christou's (2023) recommendations for using AI as a complementary tool in qualitative analysis while maintaining methodological rigor.

The process involved three sequential phases adapted from Jiang et al. (2021), Feuston & Brubaker (2021), and Christou (2023). The process rigorously adhered to Clarke and Braun's (2006, 2019) inductive model, with human oversight during coding, theme refinement, and final validation. Themes emerged directly from the data, without the use of preconceived theoretical frameworks, and the researchers' review ensured an authentic representation of students' reflections. Figure 3 summarizes the dual thematic analysis used in this study.

Figure 3

Dual thematic analysis process.



1. Manual thematic analysis

Researchers conducted a traditional inductive thematic analysis, following the methodology of Braun and Clarke (2006). This involved familiarising the data, generating initial codes, searching for themes, reviewing themes, and defining and naming themes. This manual process provided a foundational understanding of the data and established preliminary thematic structures. Figure 4 presents the stages of the manual thematic analysis implemented.

Figure 4

Thematic analysis process

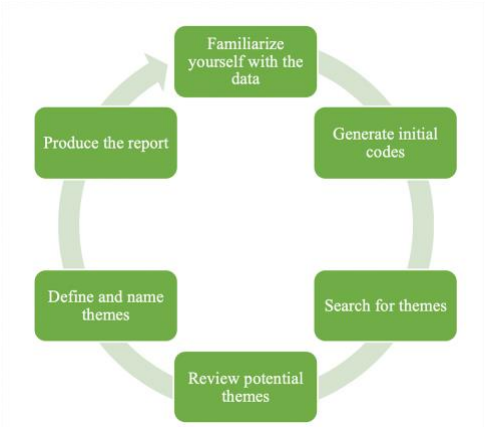


Figure 4 illustrates a systematic and iterative process adapted from Braun & Clarke (2006, 2019) that requires continuous engagement in data familiarisation, initial coding, theme identification and grouping, and theme refinement to ensure clarity and consistency. This can be particularly challenging for junior researchers with limited qualitative analysis experience (Zhang et al., 2023).

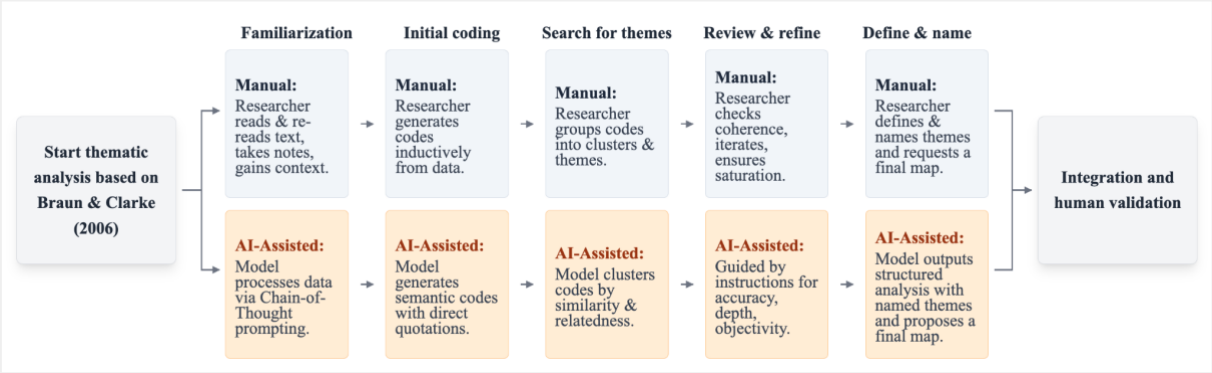
2. AI-assisted analysis

AI-assisted analysis is valuable because it provides clear guidelines, accelerates the coding process, and simplifies the analysis (Silver, 2023).

Following the manual analysis, an LLM model named DeepSeek R1 (DSR1)was employed for complementary analysis, building on the approaches discussed by Zhang et al. (2023) and Nguyen-Trung (2024). The model generated initial codes from the raw data and identified potential themes and subthemes. This AI-driven process enhanced the manual approach by highlighting emerging patterns that might have gone unnoticed. Figure 5, adapted from Turobov, A., Coyle, D., & Harding, V. (2024), compares manual thematic analysis with an AI-assisted approach, following a three-phase process: data familiarization, coding, and clustering.

Figure 5

Example of dual thematic analysis implementation with the DeepSeek R1 model. (DSR1)



As seen in Figure 5, while manual analysis relies on close reading, annotation, and iterative refinement, the GenAI model generates and clusters initial codes based on prompts. Researchers validate and refine AI-generated themes to ensure accuracy. Ultimately, both methods merge in a final integration step, where AI supports but does not replace human analytical insight.

3. Integration and validation

The final phase involved integrating insights from both approaches and validating the findings. This process involved comparing manual and AI-generated themes, identifying convergence and divergence points, and resolving discrepancies through consensus of the researchers.

Results

The results of thematic analysis applied to student responses across six sessions are presented below. Each session involved structured interventions with different AI tools, and student reflections were collected and analyzed using dual thematic analysis.

Session 1: Essay self-assessment and AI feedback

Student-teachers wrote essays and self-assessed their work using a rubric addressing five dimensions: (1) Content and ideas, (2) Organization and structure, (3) Language use and grammar, (4) Critical thinking and argumentation, and (5) Word count and adherence to instructions. They then used ChatGPT to assess the same work.

The average scores obtained from students' self-assessments and AI assessments are presented in Table 4 below, disaggregated by competence level and dimension.

Table 4

Average scores per level and dimension

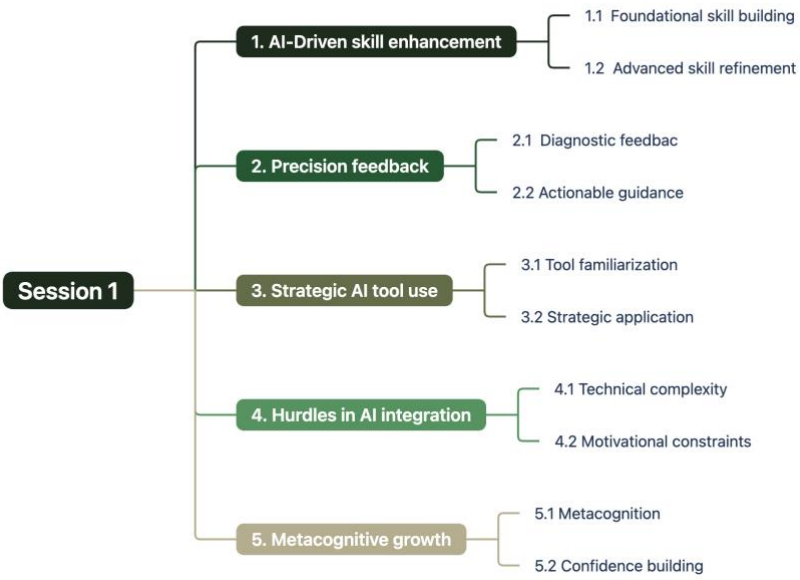
Student level	Type of assessment	Content and ideas	Organization and structure	Language use and grammar	Critical thinking and argumentation	Word count and adherence to instructions
Advanced	self	2,06	2,24	1,76	2,06	2,88
	AI	2,20	2,00	1,80	2,20	2,50
Intermediate	self	2,41	2,06	2,12	2,18	2,76
	AI	2,00	1,90	1,80	1,80	2,60

Advanced-level students evaluated their work more positively than the AI in terms of organization and structure, as well as word count and adherence to instructions. However, on average, they rated themselves lower than the AI on the remaining dimensions. In contrast, intermediate-level students consistently evaluated their writing more favorably than the AI across all assessed dimensions.

As shown in the themes that emerged in Session 1 and are presented in Figure 6 below, ChatGPT was able to support students across different proficiency levels, with intermediate learners like S14 focusing on foundational skills, stating "for improving my grammar, and to learn how to write essays in English." Students particularly valued AI's precise feedback capabilities, as demonstrated by S33's observation that "It helped me realize the very visible errors that my essay had, and that I could not see until an appropriate correction."

Figure 6

Main themes and sub-themes analyzed in session 1.



The results revealed strategic development among students, with S1-S10 expressing increased confidence: "I feel more prepared when it comes to asking for feedback or recommendations." However, implementation challenges emerged, including engagement barriers exemplified by S1-S6's comment, "Not that much. I needed more time and I wasn't in the mood." Importantly, AI tools fostered metacognitive growth, with S1-S7 noting that "This activity was very useful to understand and acquire knowledge of my own process of writing," demonstrating how students gained deeper awareness of their learning processes through AI interaction.

Session 2: Essay Outlining

Students used Claude to enhance their academic writing skills, particularly their ability to structure an essay outline.

Figure 7
Main themes and sub-themes analyzed in session 2.

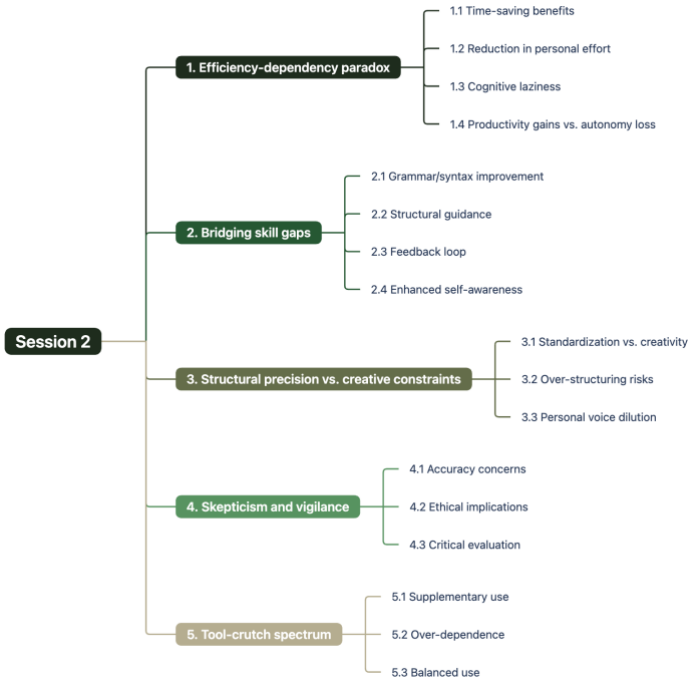


Figure 7 themes illustrate that students appreciated AI's efficiency, with S2-S5 noting, "AI gives me an outline in 10 seconds. It's fast, clear, and creative," yet worried about over-dependence as S2-S16 warned, "If AI writes everything, we'll lose originality and knowledge."

Another finding in this session underscored that AI was able to effectively support learning through grammar assistance and vocabulary development, with S2-S11 stating, "AI shows my grammar mistakes... helps me improve my writing." However, student-teachers expressed concerns about losing their personal voice.

Participants maintained critical perspectives on AI reliability, with S2-S22 cautioning, "AI can misguide you. Its summaries don't always match the essay's purpose." At the same time, S2-S19 emphasized that "AI may be wrong—we must verify everything." The results of this investigation revealed a spectrum of usage approaches, from S2-S14's recommendation to "use AI to improve existing work, not build from scratch" to concerns about AI becoming a crutch rather than a tool. Students recognized AI's value while advocating for balanced, supplementary use that preserves critical thinking and personal authenticity in academic writing.

Session 3: **AI-Assisted Brainstorming and Pre-writing**

Students used a search engine named Perplexity to enhance academic writing skills, particularly brainstorming and idea generation. The results of the analyses conducted are presented in Figure 8.

Figure 8
Main themes and sub-themes analyzed in session 3.

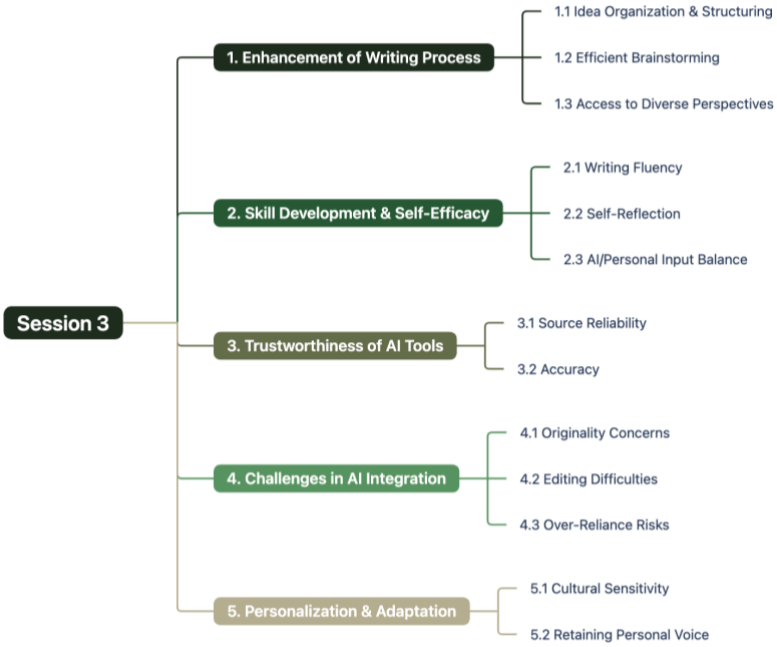


Figure 8 shows students found Perplexity highly effective for streamlining essay writing, with S3-S1 noting AI "helped me better organize the ideas I wanted to talk about. The technology fostered skill development and confidence, as S3-S8 gained "fluency in my writing" through AI interaction.

Trust in AI emerged through credible sourcing, with S3-S10 valuing "information based on real pages," which reinforced confidence in the technology's reliability for academic purposes.

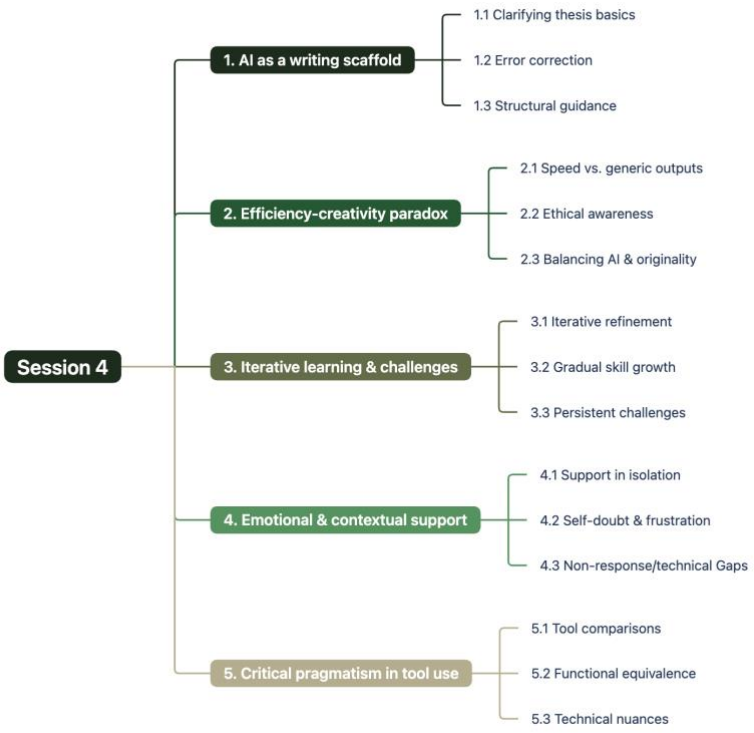
However, significant challenges arose around ethics and practicality. Students questioned the originality, with S3-S1 asking, "How to maintain originality" when using AI assistance in their writing process.

Despite these concerns, students actively customized AI use to preserve their unique voice, as S3-S24 insisted on writing "in my own words," demonstrating adaptive strategies for maintaining personal authenticity while leveraging AI capabilities for academic writing enhancement.

Session 4: Developing a thesis statement

Students participated in a structured, didactic intervention using Gemini to enhance their academic writing skills, particularly in thesis development. The results obtained from Session 4 are presented in Figure 9.

Figure 9
Main themes and sub-themes analyzed in session 4.



As seen in Figure 9, student-teachers' reflections revealed diverse experiences with Gemini for thesis writing. Intermediate students generally embraced AI as a helpful scaffold, with S4-S1 expressing, "I never understood what a thesis is... The language subject was just not for me." These students valued how the tool clarified thesis structure, corrected errors, and provided actionable feedback.

In this session, advanced students demonstrated more critical evaluation, comparing tools and identifying specific limitations, with S4-S22 criticizing that "answers are not precise... unnecessary information." The emotional support dimension emerged across both groups, with S4-S28 valuing the "good feedback... support when no one else to ask," highlighting AI's role when human guidance was unavailable.

Students navigated ongoing challenges despite AI assistance, with S4-S17 acknowledging being "terrible at creating thesis... practice with AI help." Some students demonstrated a sophisticated understanding of integrating AI with their own thinking, as S4-S26 reflected, "AI provided inspiration, but reflection was key."

This paradox between efficiency and creativity emerged repeatedly, with students valuing speed but sometimes noting generic outputs. As S4-S5 observed, AI responses "lacked nuance" or felt "formulaic," demonstrating the complex relationship between AI assistance and authentic academic expression.

Session 5: Deepening the Thesis Statement

Students participated in a structured didactic intervention using NotebookLM to enhance academic writing skills, particularly by deepening the thesis statement. The results of the analysis of participants' reflections about this session are presented in Figure 10.

Figure 10
Main themes and sub-themes analyzed in session 5.

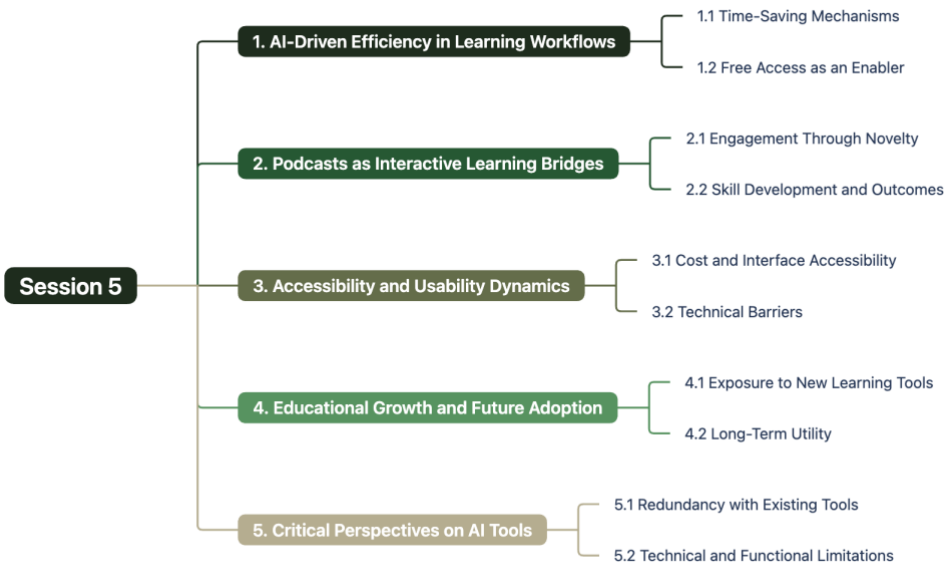


Figure 10 shows how students shared diverse experiences with NotebookLM, highlighting its efficiency in streamlining learning workflows. Students appreciated the time-saving capabilities, with S5-S2 noting it helped "save time reading or watching videos, organize my work or tasks." The free access was particularly valued, as S5-S3 pointed out, it was "completely free, whereas others require you to pay."

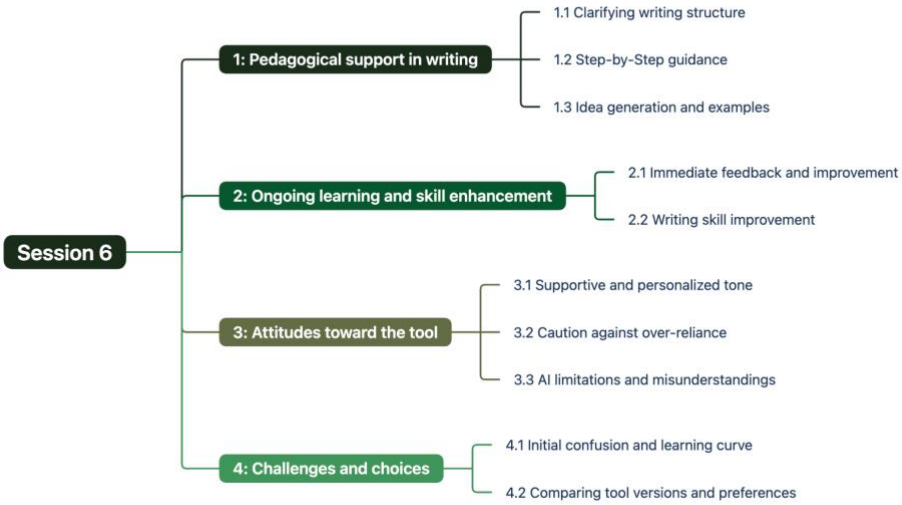
The podcast feature emerged as a standout element, creating an engaging learning experience with S5-S15 describing it as an "entertaining way" to learn. While some students found the interface accessible, with S5-S14 describing an "easy to use, friendly interface," others experienced technical difficulties, as S5-S6 found it "a little difficult because I don't understand much about technology."

Students recognized the tool's educational value, with S5-S11 appreciating the opportunity to "learn about more tools besides the classic ChatGPT" and seeing potential for long-term utility in academic and professional contexts. However, some offered critical perspectives, with S5-S8 finding it "more or less the same as other similar tools," demonstrating varied levels of enthusiasm for the platform's unique features compared to existing AI tools.

Session 6: Guided writing with AI-generated feedback.

Student-teachers participated in a structured didactic intervention using a custom GPT designed by the researchers to enhance academic writing skills, particularly building paragraphs. The results obtained from Session 6 are presented in Figure 11.

Figure 11
Main themes and sub-themes analyzed in session 6.



In Figure 11, the results obtained from the dual analysis of students' comments highlighted how the custom GPT provided clarity in writing structure, with S6-S1 explicitly stating, "Interacting with GPT helped me clarify how to structure a body paragraph, providing clear examples and focusing on concise, evidence-backed points," which captured a sense of direction and methodical support.

Regarding ongoing learning and skills development, students valued receiving immediate feedback and improving their writing. S6-S4 observed, "Yes, I think it's a lot easier because it guides you with suggestions and gives you instant feedback to make it better without losing any point," showing how real-time insights fostered continuous refinement.

Student attitudes toward the tool varied significantly, with some finding it supportive while others expressed caution. S6-S6 remarked, "I liked that the GPT was very friendly and supportive with my ideas. I think that is important to keep anybody interested," reflecting the tool's motivational role in maintaining engagement.

However, challenges and confusion emerged in tool navigation and usage. S6-S9 explained, "It was useful but still confusing because I didn't know if I had to create new paragraphs or just copy and paste what the AI was telling me, "demonstrating uncertainty in effectively using AI prompts.

Discussion

The findings of this study support and build on existing research about using AI in English writing instruction, showing how real classroom evidence can confirm what researchers have already discovered while also revealing new insights.

Previous studies have already shown that AI helps improve writing skills. Abdullayeva and Musayeva (2023) found that AI gives personalized feedback that helps students write better, and Nguyen Minh (2024) showed that ChatGPT can improve English writing skills through immediate feedback. The current study confirms these findings but adds something new: it shows that students at different skill levels use AI differently. The implementation of a progressive intervention with multiple AI tools revealed that this differentiated usage requires careful pedagogical scaffolding, where intermediate students use AI to learn and reinforce basic writing structure, while advanced students use it to polish and refine their work through more sophisticated critical analysis.

This difference between skill levels hasn't been clearly documented before. The study also shows that AI helps students think more deeply about their own writing process, which adds to what Zimmerman and Risemberg (1997) wrote about students becoming better at managing their own learning.

One major new finding in session 4 is what the theme called the "efficiency-dependency-creativity paradox"- the idea that while AI makes writing faster and easier, students worry about becoming too dependent on it and losing their creativity. This paradox manifested consistently across all six sessions, indicating that concerns about originality and personal voice are not isolated incidents but persistent challenges that require ongoing pedagogical attention.

Most research focused only on AI's benefits. For example, Mahapatra (2024) mentioned some concerns about over-reliance, but this study is the first to document in detail how students actually experience these tensions. Students expressed concerns about losing their "personal voice" and doubted whether they were truly learning. This fills an important gap because previous studies like Pham's (2025) review mostly emphasized positive results without looking at these creative concerns that students actually feel.

The study confirms earlier concerns about trusting AI but shows these concerns are more complex than previously thought. Pokrivcakova (2023) noted that teachers were generally skeptical about AI reliability, but this study indicates that students trust different AI tools for different purposes. They trusted Gemini for thesis ideas, ChatGPT-4 for detailed feedback, and Perplexity for brainstorming. This is important because most previous research looked at only one AI tool at a time, missing how different tools work together in real learning situations.

The challenges of using AI in classrooms that this study found match what earlier researchers discovered. Alabduljabbar (2024) identified problems with accessibility and ease of use, which this study confirms through students' actual technical difficulties, especially among those less familiar with technology.

The persistent nature of technical challenges across all sessions underscores the need for comprehensive introductory training and gradual integration strategies. However, this research goes further by showing that when AI implementation is matched to students' skill levels - with intermediate and advanced students using AI differently - some of these problems can be solved. The finding that schools need to introduce AI gradually with proper training supports what Xie et al. (2019) and Tan et al., (2025) recommended about personalized approaches to educational technology.

The emotional support that AI provides represents a significant addition to previous research. Some studies, such as Akhtar, Hassan, and Saidalvi (2020), have identified that many ESL students feel anxious about writing, and Ariyanti and Fitriana (2017) and Mudau et al. (2025) have documented various writing difficulties, this study clearly states how AI tools can help with these emotional barriers. When students said AI provided "support when no one else to ask" and researchers observed reduced writing anxiety, this showed that AI helps with feelings as well as writing skills. This adds to Tasisa and Tadesse's (2024) work on writing confidence by showing how AI can make students feel better about their writing abilities.

The study's approach of using multiple AI tools in a planned sequence addresses a major limitation in previous research. Most studies, including comprehensive work by Liu, Zhang, and Biebricher (2024) on AI-assisted writing, examined only one tool at a time. This study's systematic progression from broad essay assessment to specific aspects like outlining, thesis development, and paragraph construction demonstrated that AI's scaffolding function is most effective when tools are strategically selected for different writing stages.

This study's method of using different AI platforms for different stages of writing provides a more realistic picture of how classrooms might actually use these tools. It demonstrates that each tool has specific strengths that wouldn't be apparent if researchers only looked at one tool.

One of the most important findings is that students changed how they think about writing itself. Instead of seeing writing as creating one final product, they began to see it as a process of drafting, getting feedback, and revising. The transformation of students' relationship with essay writing emerged as perhaps the most significant long-term impact, where the iterative nature of AI interaction fostered a mindset shift from product-focused to process-oriented writing. This builds on Ci & Jiang (2025) research about digital age writing instruction by showing that AI tools can change students' basic understanding of what writing is. While previous studies focused on immediate improvements like better grammar or structure, this research shows that AI can lead to deeper changes in how students approach writing as a whole.

The quality of AI-generated feedback emerged as an important factor in successful implementation. The immediate and detailed nature of this feedback facilitated dynamic

improvement processes, particularly when integrated with traditional pedagogical methods rather than replacing them entirely.

The study shows that AI affects students in multiple ways at once - helping them learn skills, think about their learning, feel better emotionally, and interact socially. The metacognitive awareness developed through AI interactions proved to be a consistent theme across all sessions, suggesting that AI tools serve not only as writing assistants but as catalysts for deeper self-reflection about learning processes.

Given these multifaceted characteristics, this research demonstrates that effective AI use in writing instruction must consider all these aspects together as a complex educational tool that requires careful planning and consideration of many interconnected factors.

Pedagogical implications

This study highlights how educators can effectively integrate AI tools into language learning settings. First, there is a clear need for a structured introduction to AI tools. As evidenced by students' varying levels of comfort with chatbots like Claude, teachers should dedicate specific time to familiarising students with these tools before expecting them to use them productively. This introduction should include guided exploration, demonstration of key features, and discussion of strategic approaches to formulating effective prompts.

Equally important is implementing scaffolded learning experiences that progressively develop students' strategic use of AI. The findings suggest that students benefit from explicit guidance on utilising AI tools for specific learning purposes. This scaffolding might begin with simple error correction activities and gradually progress toward more complex applications, such as rubric-guided assessments and analytical comparisons of multiple essay drafts.

Teachers should create differentiated learning pathways based on students' proficiency levels, with intermediate students receiving more structured templates and step-by-step guides. In contrast, advanced students are given open-ended challenges that encourage experimental use of AI for rhetorical sophistication and argument development.

Instructors should design activities that encourage students to critically evaluate AI suggestions, discuss them in peer groups, and connect these discussions to the course learning objectives. This combined approach helps students develop the metacognitive skills needed to use AI feedback effectively while maintaining their agency in writing process.

The efficiency-creativity paradox identified in this study requires specific pedagogical interventions. Educators should implement "AI reflection journals" where students document their concerns about dependence and creativity, fostering ongoing dialogue about maintaining personal voice while leveraging AI support. Additionally, teachers should design assignments that explicitly require students to justify their choices when accepting or rejecting AI suggestions, developing critical evaluation skills.

Assessment practices must evolve to accommodate AI integration. Educators should develop "process-focused assessment rubrics" that evaluate not just the final writing product but also students' strategic use of AI tools, their ability to synthesize feedback from multiple sources, and their reflection on the writing process. This might include portfolio assessments that document the evolution of drafts through AI interaction and peer collaboration.

Professional development for educators is equally crucial. Teachers need training not only in the technical aspects of AI tools but also in pedagogical strategies for managing the complex dynamics of AI-assisted learning environments. This includes understanding how to facilitate discussions about AI ethics, creativity, and academic integrity while maintaining supportive learning atmospheres.

Conclusion

This study demonstrated that AI writing tools can significantly enhance English language students' academic writing when implemented through a structured, multi-session pedagogical framework.

Students reported that AI tools helped identify problems in their essays, correcting grammatical errors, and enhancing their writing comprehension. The tools provided quick, personalized feedback that showed students exactly what was wrong and how to correct it.

The researchers observed that students used AI tools in different ways, depending on their skill level. Intermediate students mostly used AI to fix basic grammar and organize their essays better, while more advanced students used the tools to make their arguments stronger and think more deeply about their topics. This suggests that AI tools can be adapted to meet various learning needs. Beyond just helping students write better essays, AI also helped them understand their own writing process better. Students became more aware of their strengths and weaknesses, learned to identify patterns in their mistakes, and developed strategies for improvement. This self-awareness proved to be an unexpected yet valuable benefit.

Students also experienced emotional benefits from using AI tools. They felt less stressed about writing and more confident in their abilities. They especially appreciated having AI help when teachers weren't available to provide guidance. The same themes persisted across all six sessions, including AI serving as a helpful support, students becoming more aware of their writing, and emotional benefits, as well as some ongoing technical issues. Despite the positive results, the study had several significant problems.

An important limitation of the study is that the sample was selected through convenience sampling, which restricts representativeness. However, this pilot group made it possible to explore initial trends and confirm the relevance of the intervention, providing a basis for future research with larger and more diverse samples.

The biggest issue was that students kept dropping out throughout the program. The study began with 50 students, but many stopped attending later sessions, as participation was voluntary. This made it difficult for researchers to fully understand the program's effects and determine whether

the benefits would persist over time. A few students worried that relying on AI would make them weaker writers in the long run.

Future research should address these limitations in several ways. Instead of asking students to volunteer, EFL teachers should incorporate AI writing activities into regular coursework and grades to ensure more students stay engaged throughout the program's duration. Future research should also determine the most effective way to integrate AI feedback with traditional teacher instruction, ensuring that students learn to utilise AI wisely without compromising their own writing skills or becoming overly dependent.

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References

Abdullayeva, M., & Musayeva, Z. M. (2023). The impact of ChatGPT on student's writing skills: An exploration of AI-assisted writing tools. *International Conference of Education, Research and Innovation, 1*(4), 61-66. https://doi.org/10.5281/zenodo.7876800

Akhtar, R., Hassan, H., & Saidalvi, A. (2020). The effects of ESL student's attitude on academic writing apprehensions and academic writing challenges. *International Journal of Psychosocial Rehabilitation, 24*(5), 5404-5412.

Alabduljabbar R. (2024). User-centric AI: evaluating the usability of generative AI applications through user reviews on app stores. PeerJ. Computer science, 10, e2421. https://doi.org/10.7717/peerj-cs.2421

Alfaruqy, D., Setyawan, H., & Rohman, T. N. (2022). Exploring first-year EFL students' problems in essay writing. *ELE Reviews: English Language Education Reviews, 2*(1), 1-12. https://doi.org/10.22515/elereviews.v2i1.4453

Al-Khulaidi, M. A., & Abdulkhalek, M. M. (2022). Academic writing problems in L2 settings: Realities and need for intervention. *Journal of English Studies in Arabia Felix, 1*(1), 42–51. https://doi.org/10.56540/jesaf.v1i1.15

Ariyanti, A., & Fitriana, R. (2017). EFL students' difficulties and needs in essay writing. *International Conference on Teacher Training and Education (ICTTE 2017)* (pp. 32-42). Atlantis Press.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101. https://uwe-repository.worktribe.com/index.php/preview/1043068/thematic_analysis_revised_-_final.pdf

Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health, 11*(4), 589-597. https://doi.org/10.1080/2159676X.2019.1628806

Ci, F., & Jiang, L. (2025). The integration of generative artificial intelligence into digital multimodal composing in second language classrooms: a scoping review from the perspective of tasks. Digital Applied Linguistics, 2, 102939. https://doi.org/10.29140/dal.v2.102939

Christou, P. (2023). How to use artificial intelligence (AI) as a resource, methodological and analysis tool in qualitative research? *The Qualitative Report*. https://shorturl.at/82ak0

Dragomir, I. A., & Niculescu, B. O. (2020). Different approaches to developing writing skills. *Land Forces Academy Review, 25*(3), 201-206. https://intapi.sciendo.com/pdf/10.2478/raft-2020-0024

Fang, X., & Deng, H. (2024). Using generative AI to facilitate digital multimodal composing in EFL learning. *The 28th Global Chinese Conference on Computers in Education (GCCCE 2024).*

Fareed, M., Ashraf, A., & Bilal, M. (2016). ESL learners' writing skills: Problems, factors and suggestions. *Journal of Education and Social Sciences, 4*(2), 81-92.

Feuston, J. L., & Brubaker, J. R. (2021). Putting tools in their place: The role of time and perspective in human-AI collaboration for qualitative analysis. *Proceedings of the ACM on Human-Computer Interaction, 5*(CSCW2), Article 469. https://doi.org/10.1145/3479856

Ghabool, N., Mariadass, M. E., & Kashef, S. H. (2012). Investigating Malaysian ESL students' writing problems on conventions, punctuation, and language use at the secondary school level. *Journal of Studies in Education, 2*(3), 130-143. https://doi.org/10.5296/jse.v2i3.1892

Habeb Al-Obaydi, L., Shakki, F., & Pikhart, M. (2025). How does emergency remote teaching affect EFL students' writing skills?. *Cogent Education*, 12(1), 2500001. https://doi.org/10.1080/2331186X.2025.2500001

Imran, M., & Almusharraf, N. (2024). Google Gemini as a next generation AI educational tool: a review of emerging educational technology. *Smart Learning Environments*, *11*(1), 22. https://doi.org/10.1186/s40561-024-00310-z

Jiang, J. A., et al. (2021). Supporting serendipity: Opportunities and challenges for human-AI collaboration in qualitative analysis. *Proceedings of the ACM on Human-Computer Interaction, 5*(CSCW1), Article 94. https://doi.org/10.1145/3449168

Li, M. (2021). *Researching and teaching second language writing in the digital age* (pp. 51-78). Palgrave Macmillan.

Liu, M., Zhang, L. J., & Biebricher, C. (2024). Investigating students' cognitive processes in generative AI-assisted digital multimodal composing and traditional writing. *Computers & Education*, *211*, 104977.

Mahapatra, S. (2024). Impact of ChatGPT on ESL students' academic writing skills: A mixed methods intervention study. *Smart Learning Environments, 11*(1), 9. https://doi.org/10.1186/s40561-024-00295-9

Maros, M., Tan, K. H., & Salehuddin, K. (2007). Interference in learning English: Grammatical errors in English essay writing among rural Malay secondary school students in Malaysia. Journal of Applied Sciences, 2(6), 1-15.

Morgan, D. L. (2023). Exploring the use of artificial intelligence for qualitative data analysis: The case of ChatGPT. *International Journal of Qualitative Methods, 22*. https://doi.org/10.1177/16094069231211248

Mudau, P. P., Cekiso, M., & Mandende, I. P. (2025). First-year students' perceptions of factors affecting academic writing. Reading & Writing-Journal of the Literacy Association of South Africa, 16(1), 567. https://hdl.handle.net/10520/ejc-reading_v16_n1_a567

Naeem, M., et al. (2023). A step-by-step process of thematic analysis to develop a conceptual model in qualitative research. *International Journal of Qualitative Methods, 22*, 16094069231205789.

Nguyen Minh, A. (2024). Leveraging ChatGPT for enhancing English writing skills and critical thinking in university freshmen. *Journal of Knowledge Learning and Science Technology, 3*(2), 51-62. https://doi.org/10.60087/jklst.vol3.n2.p62

Nguyen-Trung, K. (2024). ChatGPT in thematic analysis: Can AI become a research assistant in qualitative research? *OSF Preprint.*

Pham, N. N. H. (2025). The Use of ChatGPT in EFL students as a Learning Assistant in their Writing Skills: A literature review. *International Journal of AI in Language Education*, 2(1), 38-54. https://doi.org/10.54855/ijaile.25213

Orsi Koch Delgado, H., de Azevedo Fay, A., Sebastiany, M. J., & Cortina Silva , A. D. . (2020). Artificial intelligence adaptive learning tools: The teaching of English in focus. BELT - Brazilian English Language Teaching Journal, 11(2), e38749. https://doi.org/10.15448/2178-3640.2020.2.38749

Pokrivcakova, S. (2023). Pre-service teachers' attitudes towards artificial intelligence and its integration into EFL teaching and learning. *Journal of Language and Cultural Education, 11*(3), 100-114. https://doi.org/10.2478/jolace-2023-0022

Rebolledo, R., & Gisbert, M. (2025). Aprendizaje adaptativo del inglés como lengua extranjera con herramientas de inteligencia artificial: una revisión sistemática de la literatura. *Profesorado, Revista De Currículum Y Formación Del Profesorado*, 29(1), 241–264. https://doi.org/10.30827/profesorado.v29i1.30828

Silver, C. (2023). What's afoot in the qualitative AI space? *Qualitative Data Analysis Services.* https://www.methodspace.com/blog/whats-a-foot-in-the-qualitative-ai-space

Tasisa, M., & Tadesse, E. (2024). EFL Students' Writing Strategies, Self-Efficacy, and Performance in Ethiopia: Exploring Interrelationships. GIST – Education and Learning Research Journal, 29(29). https://doi.org/10.26817/16925777.1812

Tan, L. Y., Hu, S., Yeo, D. J., & Cheong, K. H. (2025). Artificial Intelligence-Enabled Adaptive Learning Platforms: A Review. Computers and Education: Artificial Intelligence, 100429. https://doi.org/10.1016/j.caeai.2025.100429

Turobov, A., Coyle, D., & Harding, V. (2024). Using ChatGPT for thematic analysis. Bennett Institute for Public Policy, University of Cambridge. arXiv Preprint https://doi.org/10.48550/arXiv.2405.08828

Vorobyeva, K. I., Belous, S., Savchenko, N. V., Smirnova, L. M., Nikitina, S. A., & Zhdanov, S. P. (2025). Personalized learning through AI: Pedagogical approaches and critical insights. Contemporary Educational Technology, 17(2), ep574. https://doi.org/10.30935/cedtech/16108

Wachinger, J., et al. (2024). Prompts, pearls, imperfections: Comparing ChatGPT and a human researcher in qualitative data analysis. *Qualitative Health Research.* https://doi.org/10.1177/10497323241244669

Xie, H., et al. (2019). Trends and development in technology-enhanced adaptive/personalized learning: A systematic review of journal publications from 2007 to 2017. *Computers & Education, 140*, 103599.

Zhang, H., et al. (2023). Redefining qualitative analysis in the AI era: Utilizing ChatGPT for efficient thematic analysis. *arXiv Preprint arXiv:2309.10771.* https://doi.org/10.48550/arXiv.2309.10771

Zimmerman, B. J., & Risemberg, R. (1997). Becoming a self-regulated writer: A social cognitive perspective. *Contemporary Educational Psychology, 22*(1), 73-101.

Zou, B., Wang, C., He, H., Li, C., Purwanto, E., & Wang, P. (2025). Enhancing EFL writing with visualised GenAI feedback: A cognitive affective theory of learning perspective on revision quality, emotional response, and human-computer interaction. *Learning and Motivation,* 91, 102158. https://doi.org/10.1016/j.lmot.2025.102158

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