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Leveraging Google Translate and ChatGPT Within Pedagogical Translanguaging to Enhance University Freshmen's EFL Writing

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This study applies pedagogical translanguaging in EFL writing, utilizing Google Translate (GT) and the emerging ChatGPT to help the students enrolled in a pre-EMI (English as a Medium of Instruction) writing course write short essays. The participants were sixteen college freshmen who were given two writing tasks as pre-tests before utilizing GT and ChatGPT. Subsequently, students used GT to assist them in revising the first writing task and ChatGPT to assist them in revising the second task. During the revision process, students received both peer feedback and teacher feedback to modify their essays. Later, writing tasks one and two, identical to the pre-tests, were administered as post-tests in the midterm and final exams, respectively. In both pre- and post-tests, students were not allowed to refer to any dictionaries or online resources. The results showed that both GT and ChatGPT effectively improved the students' writing performance, helped them learn more vocabulary, develop metalinguistic awareness, and increase writing motivation. However, in terms of reducing grammatical error rate, ChatGPT assistance did not yield significant benefits in the post-test. Additionally, students preferred feedback from a real teacher over that from GT and ChatGPT, as they believed that teachers could better understand their queries and provide more helpful suggestions.

Keywords: ***ChatGPT, English as a foreign language (EFL) writing, Google translate, pedagogical translanguaging***

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運用 Google 翻譯和 ChatGPT 於跨語言教學輔助大一學生英語寫作

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本研究是應用目前英語教學領域中討論度很高的跨語言教學應用（Pedagogical Translanguaging），並借助學生最常使用的線上翻譯軟體 Google Translate（GT），以及目前最時興的 Generative Artificial Intelligence（Gen AI） 應用程式 ChatGPT 來輔助 EMI 寫作先修課程的學生能寫出語意清楚且文法正確的短文。參與者為 16 位非英文主修的學生，他們被給予兩項寫作任務。在教學實驗前，兩項寫作任務會先作為前測，然後在實驗中，學生使用 GT 輔助他們改寫寫作任務一和使用 ChatGPT 輔助他們改寫寫作任務二。改寫過程中，學生會進行自我反思並根據同儕回饋和教師回饋來修改其作文。之後，分別在期中考給予學生相同於前測之寫作任務一，以及在期末考給予寫作任務二作為後測。在前、後測過程中，學生皆不能參考任何字典或使用任何線上資源。結果顯示，藉由 GT 和 ChatGPT 皆能有效提高學生作文之寫作品質，使學生學到英文字彙和片語，發展後設語言的覺察，並提升其寫作動機。但在文法錯誤率的部分，學生使用 ChatGPT 輔助，對於其後測作文並無顯著幫助。此外，學生比較喜歡真人教師的回饋甚於 GT 和 ChatGPT 的回饋。這種偏好來自於他們認為教師能更好地理解他們的問題，並提供更有幫助的建議。

關鍵詞：ChatGPT、EFL 寫作、Google 翻譯、跨語言教學應用

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Leveraging Google Translate and ChatGPT Within Pedagogical Translanguaging to Enhance University Freshmen's EFL Writing

Hsin-Yi Cyndi Huang & Chiung-Jung Tseng

1. Introduction

Writing in a second or foreign language poses significant challenges, as students often struggle to express themselves and convey their ideas as effectively as they can in their native language. This difficulty is especially pronounced among learners with lower English proficiency, who frequently face issues related to linguistic competence, such as limited vocabulary and insufficient knowledge of English grammatical structures (Piamsai, 2020). To address these challenges, scaffolding strategies, such as the use of AI-assisted writing tools, can play a crucial role in reducing student anxiety and fostering learner autonomy.

In today's rapidly evolving technological landscape, advancements in software have brought transformative changes to foreign language writing instruction and learner strategies. From the use of linguistic corpora to online translation tools like Google Translate (GT), and writing assistance, such as Grammarly and Quillbot, technology has significantly enhanced the quality of foreign language writing. A major breakthrough occurred in November 2022 with the introduction of ChatGPT by OpenAI, a generative AI-powered chatbot capable of producing human-like text based on large-scale language models (Bender et al., 2021). Tools like GT and ChatGPT have since gained popularity as innovative and revolutionary aids in English as a Foreign Language (EFL) writing. However, this widespread adoption has also raised concerns about academic integrity (Susnjak, 2022). As Yan (2023) observed, the emergence of such technologies has reshaped the pedagogical environment, prompting scholars to reconsider traditional definitions of plagiarism. Conventional views may now be outdated and in need of reevaluation.

Therefore, there is an urgent need to develop pedagogical approaches that not only harness the benefits of AI in language learning but also uphold academic integrity, empowering EFL writers while ensuring responsible and ethical use of technology.

Promisingly, recent scholarship has increasingly recognized the benefits of incorporating learners' native language into the process of second or foreign language acquisition (Turnbull, 2019; Wang & Li, 2022; Yang & Lin, 2025). As part of this growing movement, writing scholars and instructors have been inspired by the potential facilitative effects of drawing on learners' first language (L1) through pedagogical translanguaging, a flexible instructional practice that enables learners to fluidly alternate between their L1 and the target language, thus engaging their full linguistic repertoire (Yang et al., 2023). Despite the availability of powerful digital tools for EFL writing, such as GT and ChatGPT, the impact and effectiveness of integrating these technologies into pedagogical translanguaging practices remain largely underexplored. To address this gap, the present mixed-methods study investigates the effects of combining GT and ChatGPT with pedagogical translanguaging to support EFL college freshmen in their writing development. It also examines students' perceptions of translanguaging practices during AI-assisted writing processes. This study seeks to answer the following research questions:

1. What are the effects of integrating either GT or ChatGPT with pedagogical translanguaging on students' scores across the two writing tasks?

2. How does the quality of writing differ across the three versions (pre-test, revised final version, and post-test) of the two writing tasks completed with the assistance of GT or ChatGPT?

3. Are there any differences in human-evaluated scores, total word count, grammar errors, and software-generated scores between the pre-test and post-test of the two writing tasks?

4. What are students' perceptions of using GT and ChatGPT in their writing process?

2. Literature Review

2.1 Pedagogical Translanguaging

The term translanguaging, a teaching practice that intentionally alternates the language used for input and output in bilingual classrooms, first appeared in a Welsh educational context, where teachers taught and textbooks were in Welsh, but students responded in English (Lewis et al., 2012, p. 643). Over the last few decades, translanguaging has become a prominent theory and been extended by scholars to refer to as a complex language and pedagogical practice where bilingual or multilingual speakers access different linguistic features or various modes in diverse languages as an entire language repertoire to maximize communicative potential and to make sense of the world (García, 2009; García & Li, 2014). In this view, translanguaging describes the fluid language use of bi/multilingual individuals who transcend and beyond the boundaries of different language systems, using various semiotic resources suited to the context to communicate and construct meaning about themselves and their bilingual surroundings (Turnbull, 2019).

In the second language (L2) classroom, translanguaging is a teaching approach that uses both the target language and another language together in a meaningful way (East & Wang, 2024). According to Cenoz and Gorter (2022), pedagogical translanguaging is defined as a theoretical and instructional approach that could be utilized to improve language and content competencies by making use of the learners' whole linguistic repertoire so that they can compare elements, activate prior knowledge of other languages and use these linguistic elements cross-linguistically. Existing research has demonstrated that both teachers and students use their L1 to facilitate them in learning a new language (East & Wang, 2024). In classroom practice, translanguaging can be used as a scaffolding method to assist bilingual learners in learning another language (Li, 2011). EFL students can also leverage their multilingual resources to complete learning tasks by utilizing their primary language in drafting, discussing, or even interacting with a chatbot to produce their thoughts in the target language.

Numerous studies have demonstrated the positive impact of translanguaging on

language learning and teaching. As a facilitative strategy in EFL writing, pedagogical translanguaging supports L2 writers throughout various stages of the writing process. In the preparatory phase, learners use translanguaging to access resources in their native language for tasks such as note-taking (Adamson & Coulson, 2015), as well as for planning and drafting (García & Kano, 2014). Hanson (2013) found that allowing students to read in multiple languages helped them gain diverse perspectives on a topic. During the writing stage, translanguaging aids in idea generation, organization (Wang & Wen, 2002), and text construction (Adamson & Coulson, 2015). In the revising phase, learners utilize translanguaging to review their work (Adamson & Coulson, 2015) and engage in higher-order thinking (Huang et al., 2024). In addition, translanguaging has been examined as a self-regulated strategy used by L2 writers. Yang and Lin (2025) found that EFL writers frequently employ translanguaging as an autonomous learning strategy throughout the writing process and in their final written products. Similarly, Zheng and Drybrough (2023) investigated how Chinese bilingual postgraduate students used translanguaging as a self-regulatory tool during dissertation writing. Their findings showed that translanguaging supported students in outlining, note-taking, and drafting, enabling them to achieve their writing goals.

Writing is a complex process that involves generating and drafting ideas, formulating the text, refining the language, and organizing logical thoughts to achieve perfection (Zamel, 1982). Many EFL learners face challenges when completing English writing tasks, as writing in a foreign language is not as natural or easy as writing in their native language. Hence, many students often mention that they don't know where to start. In fact, the first language and the second language of EFL learners are naturally linked in their minds, and this mechanism should be utilized rather than rejected (Druce, 2012; Tsai 2020). In this study, instructors guided EFL students to use pedagogical translanguaging as a scaffold to support them in completing two writing tasks. Students were encouraged to draw on their native language to facilitate various stages of the L2 writing process, retrieving information for idea development, prompting ChatGPT, organizing their texts, and revising drafts based on peer or teacher feedback. The aim was to help students transcend the boundaries of separate language systems and engage their full linguistic repertoire. This approach

supported idea generation during the preparatory phase, content development and organization during drafting, and the enhancement of critical thinking skills during revision, ultimately enabling more effective communication and expression in the target language.

2.2 AI-based Machine Translation in EFL Writing

The use of machine translation (MT) and generative AI tools by EFL learners in L2 writing falls within the scope of Computer-Assisted Language Learning (CALL) (Kelly & Hou, 2022). Although debates persist regarding whether translation equates to writing and the overall quality of MT outputs, recent studies have highlighted several benefits of using such tools. Mehrabiyan and Sharififar (2015) noted that MT offers convenience and accessibility, allowing learners to translate content anytime and anywhere, unlike human translators who may not always be available to provide support. Similarly, Jacob et al. (2023) argued that students can use ChatGPT to translate their ideas while still maintaining their authentic voice throughout the academic writing process.

Garcia and Pena (2011) examined the impact of MT on beginner learners' writing skills and found that it helped students communicate more effectively, use a wider range of vocabulary, and include more detail in their writing. In a 2012 survey conducted at a regional university in Sweden, 66% of instructors preferred students not use MT tools; however, they acknowledged that if students had strong language skills and were able to revise and edit machine-generated content, its use could be acceptable (Kol et al., 2018).

From the perspective of meaning-making and cross-linguistic integration, MT can provide scaffolding support, especially for learners with lower English proficiency, by assisting with vocabulary and grammar. This support enhances their ability to write, revise, and edit L2 texts, often outweighing the drawbacks (Gestanti et al., 2019). Lee (2019) found that using MT as a CALL tool helped EFL learners reduce lexico-grammatical errors and improve revision skills. Interview responses further revealed that students generally welcomed the integration of MT into writing instruction. Finally, Tsai (2019) found that GT helped EFL learners reduce grammatical errors and improve the overall length of essays. He suggested that if EFL learners can effectively leverage MT tools to bypass traditional language learning constraints, this may foster transformative changes in EFL classrooms,

an evolution worth anticipating.

Previous studies have also investigated the integration of MT with translanguaging to scaffold EFL writing. Chen et al. (2019) found that translanguaging practices using GT had a synergistic effect, enabling students to draw on their full linguistic resources to produce more detailed descriptions and express a wider range of ideas. Similarly, Huang, Lo, and Tseng (2024) reported that incorporating GT enhanced students' writing in terms of content, word choice, vocabulary, grammar, and sentence structure, particularly evident in the work of lower-proficiency learners. However, they also emphasized that while GT provided certain benefits, it was insufficient for fully supporting the script-writing process. In such cases, guidance from teaching assistants and instructors remained essential, especially for sentence-level revisions and more complex feedback.

Likewise, Chen (2023) empirically confirmed that teacher corrective feedback was significantly more effective than other instructional modes in improving EFL learners' writing accuracy. In a quasi-experimental study comparing extensive reading with different writing conditions, students who received teacher feedback on their English journal writing achieved the highest posttest accuracy, outperforming those without feedback. These findings underscore that, even with the growing use of AI-based automated written corrective feedback (AWCF), human teacher intervention remains indispensable, as teachers provide contextualized feedback that supports both linguistic accuracy and higher-order writing development (Chen, 2023).

In addition, AWCF tools have been employed to help learners improve the quality of their writing. Dizon and Gayed (2021) found that students who used Grammarly outperformed their peers in L2 writing tasks. Similarly, Nazari et al. (2021) highlighted the positive impact of AI-generated feedback on learners' motivation and self-confidence. However, more cautious findings emerged in related research, such as that by Koltovskaia (2020), who observed only minimal improvement in students' cognitive engagement after using Grammarly, suggesting that the effectiveness of such tools may vary depending on the learning context.

Another AI-based writing assistance, Quillbot, was adopted by Kurniati and Fithriani (2022) to help the post-graduate students in academic writing, who showed positive attitude

towards its assistance for producing high-quality writing. After the OpenAI released ChatGPT in November 2022, the recent trend in research started to focus on this new AI-powered chatbot, which is able to offer an all-in-one service for users. Researchers have highlighted ChatGPT's potential as a tool for L2 writing. Barrot (2023) emphasizes its ability to provide adaptive feedback, offer a practice platform, and deliver personalized guidance on key writing constructs, making it a valuable resource for improving writing skills. This is supported by Özçelik and Ekşi (2024), which explores how ChatGPT helps learners acquire register knowledge across writing tasks. By offering tailored feedback, ChatGPT assists learners in self-editing, AI-assisted learning, and prompt engineering. The results suggest that ChatGPT's feedback is particularly effective for formal writing, demonstrating how its adaptive nature caters to different register needs. While ChatGPT can serve as a useful L2 writing assistant, it should be adopted as a supplementary tool for essay writing rather than a content creator, as Yan's (2023) study demonstrated. Yan applied ChatGPT's text generation feature in a one-week L2 writing practicum and found that it possesses potential in L2 writing pedagogy. However, the study's participants expressed concerns about the potential risks to academic integrity and fairness in education. His findings prompted a rethinking of plagiarism in the modern era and highlighted the need for developing regulatory policies and educational guidelines to ensure the appropriate use of the tool.

While pedagogical translanguaging has long been implemented in EFL writing instruction and extensively examined, the emergence of generative AI has created new opportunities for pedagogical applications. Among the tools available, GT and ChatGPT represent two different AI-supported affordances. GT, which can facilitate students' insufficient vocabulary, provides direct bilingual translations at the lexical and sentence level, whereas ChatGPT can automatically generate extended discourse, provide stylistic or organizational feedback, and interactively respond to learner prompts. The multifunctional capabilities of ChatGPT may offer support for EFL learners in ways that differ fundamentally from the translation-oriented assistance of GT. However, empirical studies exploring leveraging ChatGPT within pedagogical translanguaging to scaffold EFL learners' L2 writing remain scarce, especially in contrast to the more commonly studied use

of GT as a MT tool. Thus, the present study incorporated both GT and ChatGPT into the writing process of EFL freshmen. Writing Task 1 required students to complete a composition with the assistance of GT, while Writing Task 2 required them to use ChatGPT. This design explored not only the relative effects of two distinct AI tools on students' writing performance, but also examined how students perceived each tool during the learning process. More importantly, by situating GT as a well-established baseline and ChatGPT as an emergent alternative, the study hoped to contribute to the literature of machine translation in pedagogy and the relatively underexplored potential of generative AI within pedagogical translanguaging instruction.

3. Methods

3.1 Contexts and Participants

The study was conducted in an elective course, "*English Grammar and Writing I*" at a technical university in southern Taiwan. This course, offered by the university's Center for Bilingual Education, served as a preparatory writing course for English-Medium Instruction (EMI). Its primary objective was to develop students' English writing proficiency to reach at least the B2 level of the Common European Framework of Reference (CEFR), enabling them to successfully engage in EMI courses during their senior years. The participants were 16 college freshmen of non-English majors. Prior to enrollment, they took the Oxford Online Placement Test to assess their English proficiency. All participants were native speakers of Mandarin Chinese. According to CEFR results, three students were at the B1 level, while the remaining 13 were at the A2 level.

3.2 Tasks Description

GT- and ChatGPT-assisted writing instruction was implemented over the course of one semester. At the beginning of the semester, students completed Writing Task One (see Appendix 1), which served as Pre-test 1. For this task, they were required to write a two-paragraph essay of at least 120 words entirely on their own, without consulting any external resources such as online dictionaries.

Following the pre-test, students revised their Writing Task One essays through a four-

week Translanguaging GT-aided instructional sequence. In the first session of Week 1, students discussed the writing prompt in groups of four, gathered ideas from various sources, and presented their findings to the class in both English and Chinese. In the second session, each student drafted their essay in Chinese and then translated it into English using GT. In the first session of Week 2, students exchanged drafts within their groups to give and receive peer feedback. In the second session, they revised their initial translations based on this feedback. During Week 3, students consulted individually with the instructor during the first session and made further revisions based on the teacher's feedback in the second session. In the final week, students critically evaluated their latest drafts, reflected on their revisions, and produced the final version of their essays. Throughout the process, they were encouraged to actively shift between Chinese and English as needed to support their understanding, expression, and revision.

At the midpoint of the semester, students were unexpectedly assigned the same topic as in Writing Task One, which served as Post-test 1. As in Pre-test 1, they were required to write without the aid of dictionaries or external resources. Following the midterm, students were assigned Writing Task Two (see Appendix 1), which served as Pre-test 2. Over the next four weeks, they revised this task with the assistance of ChatGPT. The instructional sequence mirrored that of Writing Task One; however, due to the functional differences between ChatGPT and GT, the teacher provided additional guidance to help students navigate ChatGPT's features. Specifically, the instructor demonstrated how to interact with the chatbot through targeted examples, showcasing how to use it both as a translingual aid and as a writing assistant. Before students began revising their essays using ChatGPT, the teacher introduced a series of sample prompts, formulated in both English and Chinese, to illustrate how to elicit useful responses from the AI and maximize its affordances for writing support. At the end of the semester, students were again given the same topic from Pre-test 2 without prior notice, serving as Post-test 2. As with previous tests, no dictionaries or external tools were permitted during the writing. The difficulty levels of Writing Tasks One and Two were equivalent, as both were adapted from the intermediate-level writing sections of Taiwan's General English Proficiency Test (GEPT).

3.3 Research Instruments

3.3.1. *The Intermediate-level GEPT Writing Rubric*

The pre- and post-tests of two writing tasks were assessed by two experienced instructors using the intermediate-level GEPT writing rubric as follows:

5 – Strong Writing Ability

The content clearly and appropriately addresses the task requirements; ideas are well-organized and logically presented. Vocabulary and sentence structures are used flexibly. Occasional errors in grammar, spelling, or punctuation may be present but do not interfere with meaning.

4 – Adequate Writing Ability

The content meets the task requirements and is generally clear. The organization is mostly complete, and vocabulary and sentence structures are used correctly. Errors in grammar, spelling, or punctuation may occur but do not hinder understanding.

3 – Limited Writing Ability

The content generally relates to the task but lacks full clarity or completeness. Organization is fair, but control of vocabulary and sentence structures is weak. Frequent errors in grammar, spelling, or punctuation affect comprehension.

2 – Minimal Writing Ability

The content only partially addresses the task and is mostly difficult to understand. Organization is poor, and vocabulary and sentence structure use is very limited. Numerous errors in grammar, spelling, or punctuation interfere with understanding.

1 – No Functional Writing Ability

The content does not address the task and is incomprehensible. Lacks organization, and vocabulary and sentence structures are extremely limited. Excessive errors in grammar, spelling, and punctuation are present.

0 – No Response / Blank or Unintelligible Response

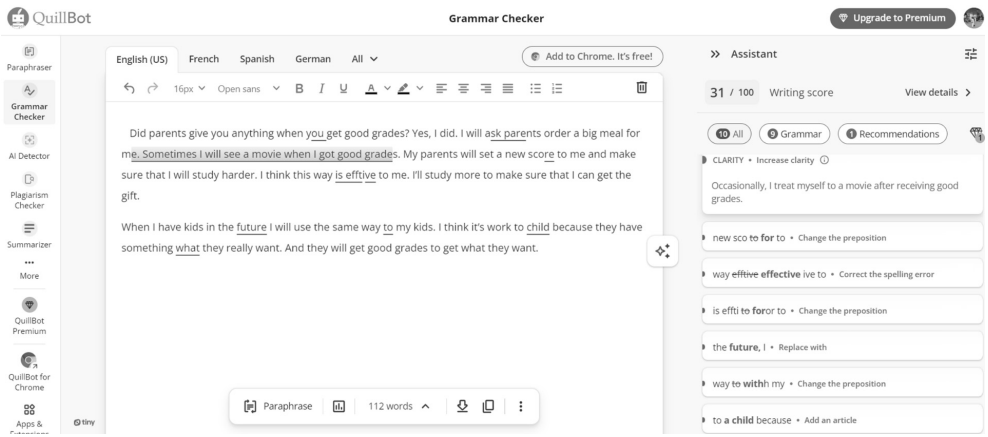
3.3.2 *Word count and grammar errors calculation*

Quillbot (https://quillbot.com/), an AI-powered online writing and paraphrasing tool,

was used to calculate the total word count and identify grammar errors in each student's essay. When a piece of writing is pasted into the platform, Quillbot automatically generates a word count and highlights grammatical mistakes, as illustrated in Figure 1.

Figure 1

A Student's Writing Sample Analyzed by Quillbot



3.3.3 *Automatic essay scoring*

Grammarly (https://grammarly.com), an AI-powered online writing assistant, was used to evaluate the quality of students' writing. When an essay is pasted into the platform, Grammarly automatically generates an overall writing score, as shown in Figure 2.

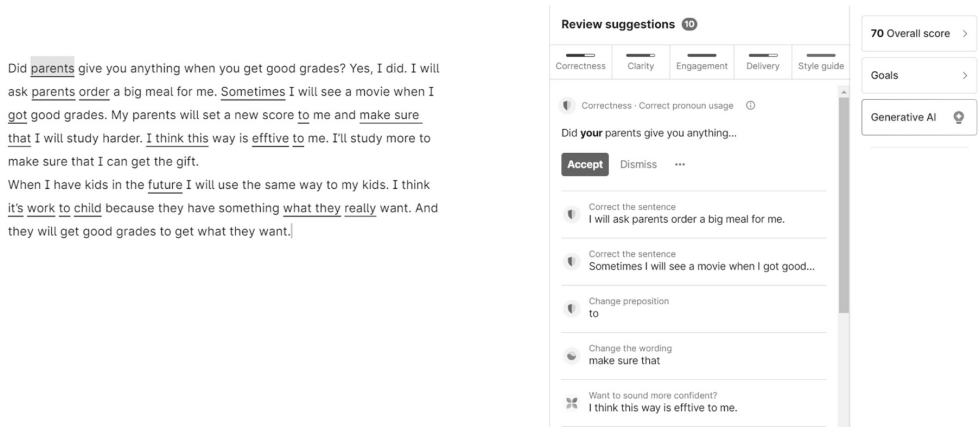
3.4 Data Collection and Analysis

Two experienced English teachers served as raters for the pre- and post-tests of two writing tasks in this study. Both raters taught *English Grammar and Writing I* to students enrolled in the preparatory classes for EMI courses. To ensure consistency and fairness in the assessment process, each student's writing tasks were independently evaluated by both raters using the intermediate-level GEPT writing rubric. The rubric rated writing ability on a six-point scale (0-5), with 0 indicating no ability and 5 representing excellent ability. The final score for each writing task was calculated by averaging the two raters' scores. Paired

samples *t*-tests were conducted to determine differences between pre- and post-tests for each task, and inter-rater reliability was measured using the Intraclass Correlation Coefficient (ICC).

Figure 2

A Student's Writing Sample Analyzed by Grammarly



To evaluate the quality of the students' essays, three versions of each task (pre-test, revised version using GT/ChatGPT, and post-test) were analyzed in Quillbot for word count and grammar error rate. The grammar error rate was calculated by dividing the number of grammar errors by the total number of words. Also, each piece of writing is also automatically scored by Grammarly based on its writing quality. A one-way repeated measures ANOVA was then performed to compare writing parameters across versions.

At the end of the semester, students completed a questionnaire survey consisting of three sections. The first section included ten 5-point Likert-scale items assessing students' perceptions of writing with GT, while the second section contained ten items evaluating their perceptions of writing with ChatGPT. The third section comprised three questions exploring their perceptions of AI-generated feedback and feedback from human teachers. An independent samples t-test was conducted to compare the scores between the first and second sections of the questionnaire.

Individual interviews with all the participants were conducted in the instructor's study room on campus, and all the interviews were audiotaped and transcribed. A thematic analysis was adopted, following the procedures proposed by Braun and Clarke (2006). First, the researchers immersed themselves in the data by repeatedly reading it to generate initial ideas about students' writing experiences with GT and ChatGPT. Both the first and second authors independently coded the data, discussed their findings, and compared them to ensure the reliability of the emerging themes. The researchers identified recurring patterns related to writing skills, interaction with AI, and students' cognitive and emotional responses. For example, initial codes like "feeling not as difficult," and "completing the task more easily" were grouped under the broader theme of "lower difficulty." After several rounds of collaborative review and refinement, comparing the two authors' initial codes and resolving discrepancies to ensure consistency, the themes were developed and categorized into four dimensions.

4. Results

4.1 Writing Performance Assisted by GT and ChatGPT

Descriptive statistics for participants' writing performance on the two tasks are shown in Table 1. The ICC results for interrater reliability indicated excellent consistency (R = 0.870, p < .001 for task 1 and R = 0.894, p < .001 for task 2). Paired-samples t-tests revealed significant differences between pre- and post-tests for both tasks (t = -7.51, p < .001; t = -6.68, p < .001). These findings suggest that using GT or ChatGPT as facilitative tools in L2 writing can significantly enhance participants' writing performance and skills.

Table 1

The Paired-samples *t*-tests Results of the Pre-and Post-test for Two Writing Tasks

Tasks	*Tests*	*Mean*	*SD*	*t*	*Sig (two-tailed)*
Writing Task One (N=16)	Pre-test	1.91	0.62	-7.51	<.001
	Post-test	3.18	0.40		
Writing Task Two (N=16)	Pre-test	1.91	0.66	-6.68	<.001
	Post-test	2.95	0.63		

*p <.05; **p <.01

4.2 Writing Quality Assisted by GT and ChatGPT

Table 2 presents the results of a one-way repeated measures ANOVA comparing the effect of using GT on the total word count, grammatical errors, and writing scores across pre-test 1, GT-revised, and post-test 1 conditions. Before conducting the ANOVA for total word count, Mauchly's test of sphericity was performed to assess whether the assumption of sphericity had been met. The test indicated that the assumption was violated, Mauchly's W = .523, $\chi^2(2) = 9.06$, $p = .011$. Therefore, the multivariate approach was adopted. The analysis revealed a significant effect of GT on word count, *Wilks' Lambda* = .41, $F(2, 14) = 10.00$, $p = .002$, partial $\eta^2 = .588$. Post hoc comparisons using three paired-samples t-tests revealed significant differences in word count between the pre-test 1 and GT-revised version ($t = -4.42$, $p < .001$), pre-test 1 and post-test 1 ($t = -3.17$, $p = .006$), and GT-revised version and post-test 1 ($t = 3.26$, $p = .005$).

Table 2

One-way ANOVA Results on Comparing the Three Versions of the Writing Parameters in the Students' Essays Assisted by GT

Measure	GT Pretest 1 Mean	GT Revised Mean	GT Posttest1 Mean	*Wilks' Lambda Value*	*F*	*p*
Total number of words	87.19	136.63	103.94	.41	10.00	.002 **
Lexico-grammatical mistake percentage	21.20	7.80	15.89	.21	25.69	.000 **
Writing Score	30.97	65.88	51.66	.11	59.70	.000 **

**p <.01

These findings suggest that using GT significantly increased the total word count in students' writing. Specifically, students produced more words when using GT compared to when they did not. Furthermore, they continued to generate significantly more words in the post-test than in the pre-test, indicating that editing GT output may have helped students acquire new words and expressions, leading to more content in their post-test writing.

There was a significant effect of using GT on the percentage of lexico-grammatical mistakes in students' writing. Prior to the analysis, Mauchly's test of sphericity was conducted and indicated that the assumption of sphericity was met, Mauchly's W = .880,

$\chi^2(2) = 1.79$, $p = .408$. The analysis showed a significant effect, *Wilks' Lambda* = .21, $F(2, 14) = 25.69$, $p < .001$, partial $\eta^2 = .786$. Post hoc comparisons using three paired-samples t-tests revealed significant differences in grammar mistake percentages between the pre-test and GT-revised version ($t = 7.25$, $p < .001$), pre-test 1 and post-test 1 ($t = 2.89$, $p = .011$), and GT-revised version and post-test 1($t = -3.44$, $p = .004$).

These results suggest that GT helps students reduce grammatical mistakes and produce higher-quality written work. While students made fewer errors in the post-test compared to the pre-test, their post-test compositions still contained more errors than those revised with GT. This indicates that students might learn some correct sentence structures from the GT-generated compositions, but have not fully internalized and mastered detailed grammatical concepts and rules.

There was a significant effect of using GT on students' writing scores, as graded by Grammarly, across the pre-test 1, GT-revised, and post-test 1 versions. Mauchly's test of sphericity indicated that the assumption of sphericity was met, Mauchly's W = .910, $\chi^2(2) = 1.32$, $p = .516$. Therefore, the sphericity assumption was retained, and the standard repeated measures ANOVA results were considered valid. The multivariate test further confirmed a significant effect, *Wilks' Lambda* = .11, $F(2, 14) = 59.70$, $p < .001$, partial $\eta^2 = .895$, indicating a substantial impact of GT use on writing quality.

Post hoc comparisons using three paired-samples t-tests showed significant differences between the pre-test 1 and GT-revised version ($t = -10.60$, $p < .001$), pre-test 1 and post-test 1 ($t = -6.32$, $p < .001$), and GT-revised version and post-test 1 ($t = 3.50$, $p = .003$). These results suggest that GT significantly enhances the overall quality of students' writing. However, the observed gap between the GT-revised and post-test 1 versions indicates that while GT assistance can produce highly polished writing, students' independent writing performance may still fall short without such support.

Table 3 summarizes the results of a one-way repeated measures ANOVA examining the effect of using ChatGPT on the total number of words, grammatical mistakes, and writing scores in students' writing across the pre-test 2, final-edited (GPT-revised), and post-test 2 conditions. Prior to the analysis, Mauchly's test of sphericity was conducted to evaluate the assumption of sphericity. The result showed that the assumption was not

violated, Mauchly's W = .808, $\chi^2(2) = 2.99$, $p = .224$. Thus, the standard repeated measures ANOVA results were considered valid. The analysis revealed a significant effect of using ChatGPT on word count, *Wilks' Lambda* = .42, $F(2, 14) = 9.73$, $p = .002$, partial $\eta^2 = .582$. Post hoc comparisons using three paired-samples t-tests revealed significant differences in word count between the pre-test 2 and GPT-revised version ($t = -4.54$, $p < .001$), between the pre-test 2 and post-test 2 ($t = -2.93$, $p = .010$), and between the GPT-revised version and post-test 2 ($t = 3.20$, $p = .006$).

Table 3

One-way ANOVA results on comparing the three versions of the writing parameters in the students' essays assisted by ChatGPT

Measure	ChatGPT Pretest 2 Mean	ChatGPT Revised Mean	ChatGPT Posttest 2 Mean	*Wilks'Lambda Value*	*F*	*p*
Total number of words	78.75	130.00	104.75	.42	9.73	.002 **
Lexico-grammatical mistakes percentage	22.03	4.67	17.72	.10	64.29	.000 **
Writing Score	34.56	72.63	52.59	.14	43.96	.000 **

**p <.01

These results suggest that using ChatGPT to facilitate writing significantly increased the number of words produced in students' compositions. Notably, students wrote more when using ChatGPT than when writing independently. Additionally, the significant improvement in word count from the pre-test 2 to the post-test 2 implies that editing and rewriting ChatGPT-generated content, while integrating their own ideas, may have helped students acquire vocabulary and expressions, which in turn enabled them to produce more content independently.

Concerning the effect of using ChatGPT on the percentage of grammatical mistakes in students' writing, a one-way repeated measures ANOVA was conducted across the pre-test 2, GPT-revised, and post-test 2 conditions. Mauchly's test of sphericity indicated that the

assumption of sphericity was met, Mauchly's W = .998, $\chi^2(2) = .25$, $p = .988$. Thus, the standard repeated measures ANOVA was appropriate. The analysis revealed a significant effect of using ChatGPT on grammatical mistake percentage, *Wilks' Lambda* = .10, $F(2, 14) = 64.29$, $p = .000$, partial $\eta^2 = .902$. Nonetheless, not all three paired samples t-tests for post hoc comparisons show significance. Only two tests between the pre-test 2 and GPT-revised version ($t = 11.27$, $p < .001$) and between the GPT-revised version and the post-test 2 ($t = -8.26$, $p < .001$) yielded significant differences, The tests between the pre-test 2 and post-test 2 ($t = 2.70$, $p = .017$) didn't reach significant difference since the number used to determine statistical significance in this case is .017 rather than .05 due to the fact that there were three tests instead of just one (05/3 = .017). These results suggest that using ChatGPT helps students reduce grammatical errors when revising with AI support. Students made significantly fewer grammatical mistakes in the GPT-revised texts compared to both the pre-test and post-test, which aligns with interview findings in which students expressed greater satisfaction with ChatGPT's grammar-related feedback. However, the lack of a significant improvement from pre-test to post-test indicates that without instructional support, ChatGPT alone may not sufficiently enhance students' grammatical proficiency. Moreover, since ChatGPT automatically generates error-free text, students may rely on it without fully engaging in critical reflection or active rewriting, potentially reducing the effectiveness of grammar learning compared to more guided tools such as GT.

A one-way repeated measures ANOVA was conducted to examine the effect of using ChatGPT on students' writing scores, as graded by Grammarly, across the pre-test 2, GPT-revised, and post-test 2 versions. Mauchly's test of sphericity indicated that the assumption of sphericity was met, Mauchly's W = .899, $\chi^2(2) = 1.50$, $p = .473$, so the standard ANOVA results were considered appropriate. The analysis revealed a significant effect of ChatGPT use on writing scores, *Wilks' Lambda* = .14, $F(2, 14) = 43.96$, $p < .001$, partial $\eta^2 = .863$, indicating a significant difference in writing performance across the three stages. Post hoc comparisons using three paired-samples *t*-tests showed significant improvements between the pre-test and GPT-revised version ($t = -9.18$, $p < .001$), between the pre-test 2 and post-test 2 ($t = -3.58$, $p = .003$), and between the GPT-revised version and the post-test ($t = 5.11$, $p < .001$).

These results suggest that using ChatGPT significantly enhances the overall quality of students' writing. Notably, students' post-test 2 performance remained improved compared to pre-test 2, implying some transfer of learning. However, the persistent gap between the GPT-revised version and the post-test 2 indicates that, although students benefited from editing with ChatGPT, their independent writing still did not reach the same level of quality as the ChatGPT-assisted version.

4.3 Comparison of the Facilitative Effect between GT and ChatGPT

The results of an independent samples *t*-test comparing the human-rated pre-test scores for the two writing tasks showed no significant difference (t = .000, p = 1.000). Similarly, there is also no significant difference between the post-test scores of writing task One and those of writing task Two (t = 1.217, p = .235). This indicates that there is no significant difference in the improvement of students' writing skills between using GT to assist their practice in writing Task One and using ChatGPT as an auxiliary tool in writing Task Two. Moreover, the results of the independent samples *t*-test comparing the total word count between pre-test 1 and pre-test 2 indicated no significant difference (t = .868, p = .393). In a similar vein, there was also no significant difference in the total word count between post-test 1 and post-test 2 (t = -.069, p = .946). This suggests that using two different assistive tools does not have a significant impact on the total number of words in their writing.

The results of the independent samples *t*-test comparing the grammar error rates indicated no significant difference between pre-test 1 and pre-test 2 (t = -.414, p = .682). Similarly, there was no significant difference in the grammar error rate between the post-test 1 and the post-test 2 (t = -.973, p = .338). This suggests that using two different assistive tools does not have a significant impact on the grammar error rate in their writing. The results of the independent samples *t*-test comparing the AI-assessed scores of pre-test 1 with pre-test 2 indicated no significant difference (t = -.774, p = .445). Similarly, there was no significant difference in the AI-assessed scores between post-test 1 and post-test 2 (t = -.160, p = .874). This suggests that using two different assistive tools does not have a significant impact on the AI-assessed composition scores.

4.4 Learners' Perceptions of Using GT and ChatGPT as Writing Aids

Table 4 and Table 5 below present the results of a survey using a 5-point Likert scale investigating students' perceptions of using GT and ChatGPT to scaffold writing (1 being strongly disagreed, 5 being strongly agreed), respectively. The results indicated that students' perceptions and satisfaction with ChatGPT were generally higher than those of GT in all ten questions except for Q3. Because Q3 was a reverse-coded question, the lower scores mean higher perceptions. Moreover, an independent samples *t*-test revealed significant differences, particularly in Q2, Q7, and Q9, with $p < .05$. Q2 demonstrated students' significantly greater satisfaction with the content generated by ChatGPT compared to GT. Q7 showed students' significant preference for using ChatGPT to generate text, incorporating their own ideas into their writing, and then editing the text– over using GT. Additionally, students thought that ChatGPT was significantly better than GT in enhancing their grammar knowledge in Q9.

Table 4

Students' Perceptions on Using GT as Writing Aids

Survey Items	*M*	*SD*
1. I believe writing in Chinese first and then using Google Translate (GT) to translate into English better conveys my ideas.	3.94	1.1
2. I am satisfied with the content generated by GT.	3.19	0.75
3. I have concerns about the accuracy of the wording and grammar in GT translations.	4.06	0.57
4. I can spot grammatical errors in GT-translated text.	3.63	0.80
5. I can identify parts of GT-translated text where the meaning is unclear or incoherent.	3.88	0.96
6. I find GT provides instant feedback like a teacher, making it more convenient and efficient than waiting for real feedback.	2.94	1.12
7. I am satisfied with writing in Chinese, using GT to translate into English, then revising, and I plan to continue using this method.	3.63	0.81
I think this approach of translating Chinese into English using GT and then revising can…	3.75	0.68
8. improve my English writing skills.		
9. enhance my knowledge of English grammar.	3.69	0.70
10. increase my English vocabulary.	3.88	0.62

Table 5

Students' Perceptions on Using ChatGPT as Writing Aids

Survey items	M	SD
1. I find using content generated by ChatGPT and revising it with my own ideas very helpful for improving my English writing.	4.31	0.48
2. I am satisfied with the content generated by ChatGPT.	3.81*	0.75
3. I have concerns about the accuracy of the wording and grammar in ChatGPT-generated text.	3.69	0.87
4. I can spot grammatical errors in ChatGPT-generated text.	3.44	1.00
5. I can identify parts of ChatGPT-generated text where the meaning is unclear or incoherent.	3.44	0.96
6. I believe ChatGPT provides instant feedback, making it more convenient and efficient than waiting for real teacher feedback.	3.63	1.26
7. I am satisfied with generating text using ChatGPT, adding my own ideas, and revising it, and I plan to continue using this method.	4.19*	0.54
I think this approach of using ChatGPT to generate text and revise it can…		
8. improve my English writing skills	4.13	0.62
9. enhance my knowledge of English grammar.	4.19*	0.66
10. increase my English vocabulary.	4.13	0.72

*p <.05

Table 6 below shows students'' perceptions of AI feedback compared to feedback from real teachers. On a five-point Likert scale, the results indicate that students generally believe the suggestions and feedback from real teachers are more helpful for their writing than the feedback from GT and ChatGPT.

Table 6

Students' Perceptions of AI Feedback and Feedback from Real Teachers

Questions	*M*	*SD*
I feel that…		
1. using GT to assist me in writing English increases my motivation to write in English.	3.50	0.73
2. using ChatGPT to assist me in writing English increases my motivation to write in English.	3.94	0.57
3. suggestions and feedback from real teachers are more helpful for my writing than the feedback from Google Translate and ChatGPT.	4.25	0.58

All students participated in one-on-one semi-structured interviews, and their responses were categorized into four dimensions. Figure 1 below shows a thematic map illustrating the dimensions and key themes of the interviews.

4.4.1 *English Learning Motivation*

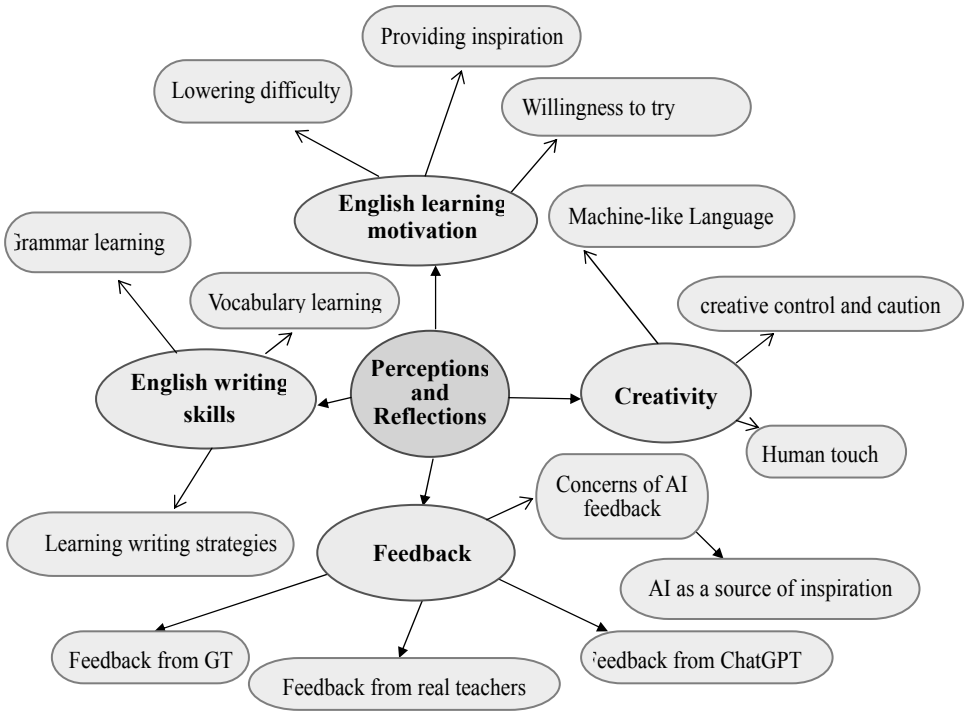
Students' reflections revealed three recurring themes within the dimension of English Learning Motivation: lowered writing difficulty, provided inspiration, and increased willingness to try. To begin with, many students reported that online translation tools helped reduce the difficulty of English writing, making the task feel more manageable. For example, Student 13 stated, "In the past, I usually couldn't finish writing English compositions smoothly, but with the help of AI, I was able to complete them more easily." This response was coded as reduced difficulty, reflecting how AI assistance eased the writing process.In addition, students described how ChatGPT acted as a source of inspiration, particularly in generating ideas and structuring their writing. Student 12 shared, "I feel more motivated because using ChatGPT to write the introduction gives me more inspiration. It provides many references to help me complete the introduction," which was coded as idea generation. Lastly, AI tools appeared to enhance students' willingness to engage in writing, especially by reducing feelings of frustration. Student 11 expressed, "I feel more motivated; otherwise, there would be too much frustration, and I wouldn't feel like I couldn't continue writing." This was coded as increased willingness to try, highlighting how the emotional support from AI made writing more approachable.

4.4.2 *English Writing Skills*

When discussing the impact of AI tools on their writing skills, students identified three major areas of growth: vocabulary learning, grammar awareness, and writing strategy development. Vocabulary learning emerged as a significant benefit, with many discovering new words and phrases they would not have encountered otherwise, which was coded as lexical awareness. Grammar learning, on the other hand, received mixed feedback. While some students reported gaining a better understanding of sentence structures, they still found grammar concepts challenging and in need of teacher guidance. Student 11 remarked, "Even if you know the vocabulary, if you don't understand the grammar, you still won't be able to write much. It helps a little, but ChatGPT doesn't really teach me grammar." This was coded as limited grammar instruction.

Figure 3

Thematic Map of the Interviews



In addition to vocabulary and grammar, students developed various writing strategies through AI-assisted writing. Rewriting, editing, organizing outlines, and critical thinking were frequently mentioned as skills they refined with AI support. Some students, like Student 5, described how ChatGPT helped verify whether their Chinese-planned ideas were accurately expressed in English, which was coded as content verification. Others, such as Student 12, found it useful for exploring different writing styles: “I ask GPT to give me three versions, and by reading them, I can understand new grammar and learn new methods,” which was coded style experimentation. Similarly, Student 14 appreciated the AI’s ability to aid in editing and revision: “It provides an outline, which helps me come up with ideas and make revisions more quickly,” which was coded as outlining and revision.

4.4.3 *creativity*

Students' responses regarding creativity reflected a mix of appreciation and critique, forming four key themes: mechanization of AI writing, human touch, AI as a source of inspiration, and creative control and caution. One recurring concern was that ChatGPT-generated text often felt mechanical and lacked emotional depth, making it appear artificial, which was coded as mechanical tone. In contrast, many students valued the human touch in their own writing. They believed their original ideas were more expressive, innovative, and personal compared to AI-generated content, which was coded as emotional warmth. Despite these concerns, AI was still widely viewed as a helpful tool for inspiration. Several students noted that ChatGPT provided ideas they could modify and build upon, especially when struggling with writer's block, which was coded as sources of creative ideas. Student 8 described this process: "AI can give me a lot of ideas to reference, and I can modify those ideas to create the article I want to write." However, students remained cautious about over-relying on AI, emphasizing that their own creativity should lead the writing process. Many preferred to draft their ideas first and consult AI only when necessary, ensuring that technology supplemented rather than dictated their writing. The responses were coded as human-centered AI.

4.4.4 *feedback*

When it came to feedback, students distinguished between different sources and their effectiveness, reflecting four core themes: feedback from GT, feedback from ChatGPT, feedback from real teachers, and concerns of AI feedback. GT feedback was perceived as fast and convenient but often inconsistent in coherence and grammar, offering only direct translations without contextual guidance. In contrast, ChatGPT provided more advanced, personalized, interactive feedback through learners' prompts. This enabled students to clarify semantic nuances and refine their writing for both accurate translation and more effective idea expression. Overall, students regarded ChatGPT as more helpful than GT because, beyond correcting language, serving like a writing partner, it provided explanations, inspiration, and opportunities to improve their writing in ways that GT could not. However, they also noted some drawbacks, such as its tendency to generate overly complex vocabulary and occasional grammatical confusion.

Despite the benefits of AI-generated feedback, students overwhelmingly felt that real teachers provided the most valuable insights. Teachers' feedback was seen as more personalized and comprehensive, addressing individual weaknesses more effectively than AI tools. Beyond evaluating AI feedback, students also expressed concerns about its potential drawbacks. While ChatGPT made assignments easier to complete, they worried about issues such as plagiarism and over-dependence. Student 3 pointed out, "People may become dependent on it and stop thinking for themselves," which was coded as overreliance. Others, like Student 4, feared that excessive reliance on AI could diminish originality and stated, "Because it's so easy to get answers, people may rely on it too much and lose their own ideas," which was coded as reduced originality. Student 7 echoed this sentiment, stressing the importance of maintaining independent thought and said, "You need to have your own ideas before asking AI to rewrite. Letting it do all the work takes away your thoughts and prevents critical thinking," which was coded as critical thinking loss. Most students agreed that if an assignment lacked personal input, it could not be considered genuine work and bordered on academic dishonesty.

5. Discussion

The quantitative and qualitative results of the study revealed the facilitative effects of translanguaging with AI tools, GT and ChatGPT, for EFL freshmen with lower English proficiency during the two writing tasks.

For the first research question, which examined how the students' writing performance improved as they translanguaged with GT or ChatGPT during the writing tasks, the results revealed a significant score increase, as assessed by two human raters, between the pre-test and post-test of both writing tasks. This indicates that the use of either GT or ChatGPT helped students improve their writing performance in terms of content, organization, vocabulary, and grammar, which aligns with previous findings (e.g., Garcia & Pena, 2011; Lee, 2019; Tsai, 2019; Tsai et al., 2024). As the students were engaged in revising their essays for the two writing tasks, to solve the problems of insufficient English proficiency to complete the tasks, the students drew on their entire linguistic repertoire, used their native language to interact with ChatGPT to enhance communication, and performed problem-

solving. This process is an autonomous translanguaging practice, which involves negotiation for meaning, thinking, and communicating thoughts, even though ChatGPT is not a real human (Yang & Lin, 2025). Additionally, the findings also showed that the students verified whether the AI-generated content aligned with their intended meaning, rather than solely relying on AI-generated translation, in which the students exhibited metalinguistic awareness and demonstrated writing autonomy. These observations align with Yang and Lin (2025), which found that translanguaging practices heightened students' awareness of syntactic and lexical similarities and differences between Chinese and English. Nevertheless, since the pre-test and post-test of both writing tasks used the same topics, the possibility that students' improvement was influenced by a practice effect cannot be ruled out.

For the second research question, which focused on how the writing quality of students' three versions of essays from the two tasks differed in terms of total word count, lexical-grammatical mistakes, and writing scores graded by Grammarly, the results indicated that both GT and ChatGPT significantly improved the quality of students' writing. However, the post-test essays, written without AI assistance, still demonstrated a gap in quality compared to those aided by GT or ChatGPT. This finding aligns with Yang and Lin (2025), which found that during the translanguaging process of negotiating meaning with AI, students demonstrated metalinguistic awareness by actively recognizing and comparing syntactic and lexical similarities and differences between Chinese and English. They argued that this metalinguistic awareness enables students to use AI as a tool for independent language development.

Cenoz and Gorter (2022) also pointed out that engaging in meaning negotiation through translanguaging with AI simultaneously deepens students' linguistic understanding. Additionally, in the context of pedagogical translanguaging, AI-generated feedback in students' L1 encouraged cognitive engagement in language acquisition and, in turn, strengthened their metalinguistic awareness (Ossa Parra & Proctor, 2021). These findings are also consistent with previous research on MT in writing, which indicated that students could enhance their vocabulary acquisition, translation skills, and writing revision through the use of MT tools (Huang et al., 2024; Lee, 2019).

The third research question investigated how students engaged with and perceived the use of GT and ChatGPT at different stages of the writing process, and what facilitative effects each tool appeared to have on developing EFL students' writing skills. While both tools effectively enhanced students' writing performance in English as a foreign language, interview feedback revealed a preference for ChatGPT. Students felt that ChatGPT provided better grammatical accuracy, idea generation, and interactivity compared to GT. Automated analysis data from Quillbot and Grammarly, which compared word count, grammatical error rate, and writing scores revealed that both GT and ChatGPT supported improvements in students' writing, with no clear evidence that one tool was consistently superior to the other on the writing parameters. Both tools significantly increased word count, helped students express more ideas, and expanded their vocabulary, which was consistent with students' interview feedback about learning new English words and phrases.

Interestingly, while students using ChatGPT reported learning some grammar rules and sentence structures, their post-test essays did not show a salient decrease in grammatical error rates. In contrast, in the Writing Task 1, students engaged with GT showed somewhat greater reductions in errors, though overall error rates in the post-test version compared to those aided by GT remained high. This aligns with student concerns from interviews, where they noted that using ChatGPT might limit their critical thinking and foster dependency, despite learning some grammar rules and sentence structures from the tool. This finding also corresponded with interview feedback, where students stressed the importance of originality in writing. They viewed ChatGPT-generated content as a source of inspiration and reference, emphasizing that without their personal input, using such tools would amount to plagiarism rather than genuine work.

This finding is consistent with a study by Johnston et al. (2024), which explored British university students' views on the legitimacy of AI tools in academics. Most students supported the use of AI for grammar correction, especially for non-native English speakers, but did not endorse relying on AI to write entire essays. Johnston et al. emphasized that educators have a responsibility to teach students the proper use of AI tools and establish assessment criteria that ensure original ideas are present in student work. Teachers can also encourage critical analysis of AI-generated texts by engaging students in discussions,

promoting critical thinking to review, analyze, and revise these texts. Although essay scores were generated by online writing software, students who incorporated their own ideas were more likely to produce high-quality work in the post-test, even without AI assistance.

Previous studies (e.g., Tsai et al., 2024) have demonstrated that AI tools like ChatGPT have the potential to improve the four dimensions of writing quality, namely, content, organization, grammar, and vocabulary. Drawing on the findings of the current study, although students demonstrated better writing quality in their AI-assisted revisions using GT or ChatGPT, there remained a gap between these revisions and the post-test writing that the students produced independently. Thus, the findings offer several teaching implications for EFL writing. At first, it is crucial for teachers to be aware that the revisions students produce with AI assistance do not accurately reflect their true writing abilities. However, teachers should guide learners on how to critically analyze the organization, sentence structures, and vocabulary use in AI-generated texts and identify persistent grammatical issues, and integrate teacher and peer feedback to deepen their learning. Then, regarding grammatical error rates, while students using GT showed a significant reduction in errors from pre-test to post-test, the post-test error rate remained relatively high compared to compositions directly assisted by GT. This suggests that although students learned correct sentence structures through rewriting, they still had unresolved or vague grammatical concepts requiring further clarification. Nonetheless, some students mentioned in interviews that they learned grammar from ChatGPT. Therefore, to help learners effectively acquire grammar through ChatGPT, teachers should design tasks that encourage students to identify grammatical errors in their writing and understand how AI tools correct these errors. Moreover, incorporating peer feedback can foster higher-level critical thinking, helping students better grasp grammatical concepts.

Regarding the fourth research question of learners' perceptions of using GT and ChatGPT as writing aids, results from the questionnaires and interviews showed that GT and ChatGPT significantly boosted writing motivation for low-proficient English learners. With the assistance of AI tools, students found essay writing less challenging and were more motivated to engage in writing. They also expressed positive views about integrating AI into their writing process, seeing co-creation with AI as beneficial. AI provided

inspiration when they lacked ideas and generated useful reference samples, opening up new possibilities for their writing. This aligns with Wu et al. (2021), who highlighted that AI enhances creativity and efficiency in "meaning-making" processes, promoting collaboration between humans and AI. However, students emphasized that AI could not replace feedback from human teachers, which they regarded as superior in quality. While they recognized ChatGPT's convenience, they valued the distinctiveness of human thought and were resistant to being overly dependent on AI. This finding echoes Steiss et al. (2024), which showed that feedback from experienced teachers surpasses that of AI, though ChatGPT can still be a helpful tool in the absence of human feedback or during the drafting process.

6. Conclusion

This study employed pedagogical translanguaging to help 16 low-proficiency freshman students improve their English writing by using GT or ChatGPT as aids. Through a mixed methods design, we utilized SPSS *t*-tests and one-way ANOVA (repeated measures) to analyze the scoring results from real teachers, AI software Grammarly, and the automatic writing parameters generated by Quillbot. Additionally, we examined the survey and interview results for the students' perceptions. The study yielded three main findings.

To start with, both GT and ChatGPT effectively supported students' English writing, improving the quality of their essays. Students preferred using ChatGPT, perceiving it as more helpful than GT in terms of translation accuracy, creative generation, and interactivity. Next, writing essays assisted by both tools significantly helped deepen students' linguistic understanding and develop metalinguistic awareness so that they can write more content and details and learn new vocabulary and phrases. However, in terms of reducing grammatical errors, especially with ChatGPT, there was no significant decrease in error rates. This could indicate that, since ChatGPT produces more grammatically correct text, students felt less need to revise and thus saw no substantial reduction in grammatical errors in the post-test. Despite this, students believed that ChatGPT helped them learn grammar. Therefore, in pedagogical applications, it is recommended that if teachers want students to use ChatGPT to learn grammar concepts, they should design tasks that require students to identify types of grammatical errors in their writing and to understand and learn the

grammatical concepts through ChatGPT's feedback, which could lead to significant improvements in grammar in their English writing. Afterwards, students still preferred feedback from real teachers over ChatGPT or Google Translate, as they felt that teachers better understood their issues and could provide more comprehensive suggestions.

Given that this study was conducted shortly after the release of ChatGPT, it provides valuable pedagogical insights and suggestions for integrating AI tools into foreign language writing instruction. Nevertheless, the results of this study should be applied with caution due to certain limitations in the research design, including the small number of participants and the lack of a control group. Future research should address these limitations by incorporating more diverse writing tasks and larger sample sizes. Additionally, further investigation is needed on how to effectively use AI to enhance the grammatical knowledge of English as a Foreign Language (EFL) learners, particularly for students with lower English proficiency. Exploring differentiated grouping to provide peer feedback or other collaborative grammar learning tasks could also be worthwhile areas for future research.

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Appendix A

The following two writing tasks were adopted from GEPT Intermediate Level Speaking and Writing Practice Test published by Language Training & Testing Center (LTTC) of Taiwan.

Writing Task One:

In general, when children perform well, parents often reward them. Please write an essay explaining:

(1) When you perform well, how do your parents usually reward you? Do you think these methods are effective and appropriate?

(2) If you become a parent one day, would you use the same reward methods?

Writing Task Two:

In recent years, exercising and fitness have become a popular trend. Please write an essay:

(1) Explaining the possible reasons behind this trend;

(2) Giving examples of how you or people around you have developed the habit of exercising regularly.