

# A Quantitative Inquiry Into Translation App Usage and Post-Editing Strategies Among Taiwanese EFL Tertiary Students

Ya-Ting Zhan

Department of Applied English, Chaoyang University of Technology, 413310, Taichung, Taiwan

Hsiao-Tung Hsu\*

Department of Applied English, Chaoyang University of Technology, 413310, Taichung, Taiwan

**Abstract**—With enhanced technology, numerous students increasingly use varied applications to facilitate their English learning, and some have chosen translation apps to improve their comprehension. However, due to the imperfect and inconsistent quality of translation, the content produced by these apps may still require verification and correction. This study examined how Taiwanese tertiary students utilized translation apps to help them learn English, what post-editing strategies they adopted to check the final product, and their perceptions of using these apps. A total of 519 participants were recruited, and data were analyzed using descriptive statistics, independent t-tests, and one-way ANOVA through SPSS Statistics 23. The results revealed that students primarily used translation apps for reading comprehension, vocabulary acquisition, and pronunciation practice. They frequently applied light post-editing strategies to correct grammar and word choices and full post-editing strategies to add context or rectify inaccurate translations. It also showed that English proficiency influenced students' use of post-editing strategies; intermediate and proficient students employed post-editing strategies more frequently than those at the preliminary level. Most students expressed positive attitudes toward using translation apps to learn English. Finally, this study highlights the potential of integrating translation apps and post-editing strategies to improve students' learning efficiency, reinforce their linguistic abilities, and foster metacognitive development.

**Index Terms**—translation apps, English learning, tertiary EFL learners, post-editing strategies

## I. INTRODUCTION

Translation is a strategy that helps people break the language barrier and is often used in the language learning process. Yulita (2021) indicated that through the translation process, learners could comprehend the contexts and learn English more promptly. As learners learn languages via translation, they can improve language skills, such as listening, speaking, reading, and writing. Therefore, translation can be an effective language learning technique for individuals learning English as a Foreign Language (EFL) (Samardali & Ismael, 2017).

Owing to the advancement of technology, language learners have more options that are different from the traditional learning models to support the language learning process via varying learning tools. Among these tools, language learning applications (apps) are properly regarded as the most effective way to suit individuals' needs without restrictions on time and place. Take translation apps as an example; some researchers indicated that applying Google Translate in language courses improved students' English reading, writing, vocabulary, and translation skills (Alhaisoni & Alhaysony, 2017; Bahri & Mahadi, 2016), among which most significant is for practicing their writing skills. Moreover, after utilizing translation apps for English learning, Bahri and Mahadi (2016) pointed out that students enjoyed their English learning process more and better understood their English proficiency. Using apps in language learning not only brings some benefits to learners, but they also have positive attitudes toward using translation apps in their language learning experiences.

Apart from making good use of proper apps in language learning, the translation abilities of learners, namely the competence of post-editing, play an essential role in producing qualified translation texts. Post-editing is generally defined as correcting the output produced by machine translation (MT). Lin et al. (2021) suggested that to prevent language-related jobs from being replaced by AI in this AI-powered era, language learners need to learn how to recognize and assess the quality of the raw output and cultivate their post-editing abilities. Currently, machines cannot provide a translated text full of warmth, creation, and characteristics. Hence, in response to the ever-changing technology, learners are advised to develop their transcreation competence and enhance post-editing skills to offer improved high-quality translation work (Lin et al., 2021).

Most of the studies separated the topics of translation strategies (Edelia & Maharsi, 2022; Khan et al., 2021; Liao,

---

\* Corresponding Author.

2006; Thani & Ageli, 2020) and post-editing strategies (Girletti, 2022; Hong & Lee, 2021), and the former targeted EFL learners, while the latter targeted professional editors and translators. Given this, this study focused on tertiary students in Taiwan. It aimed to examine students' use of translation apps in English learning, explore their post-editing strategies after using translation apps, and gain insight into their perspectives on integrating translation apps into their language learning process. Based on the purpose of the study, the following research questions are proposed:

1. In what ways do students utilize translation apps to support their English learning process?
2. What types of post-editing strategies do students employ after generating translations through apps?
3. How do students perceive the use of translation apps as a supplementary tool for learning English?

## II. LITERATURE REVIEW

### A. Translation as an English Learning Strategy

Students often use translation while learning foreign languages since it is a practical learning way to acquire their second language (Samardali & Ismael, 2017). Through translation, it could improve students' English in various aspects, such as vocabulary, grammar, idiomatical expressions, writing skills, and so forth (Alaboud, 2022; Khan et al., 2021; Samardali & Ismael, 2017). Additionally, based on Alaboud's (2022) research, students could improve their linguistic and conversational abilities when learning translation accompanied by innovative devices. Using effective translation tools to learn languages helps learners progress significantly in improving their foreign language skills.

Liao (2006) indicated that EFL learners frequently took translation as an English learning strategy. Some research held a positive attitude toward translation in English learning (Edelia & Maharsi, 2022; Khan et al., 2021; Liao, 2006; Ying et al., 2018) and has revealed that learners used their first language to help them comprehend the contents of a foreign language (Edelia & Maharsi, 2022; Liao, 2006; Ying et al., 2018). However, some research argued that translation harms learners' English learning process (Thani & Ageli, 2020; Ying et al., 2018). Further, different factors influenced learners' utilization of translation. For instance, low English-proficient learners preferred translating in English learning, while high English-proficient learners preferred using English directly. Learners with high English proficiency were inclined to learn English skills by analyzing different grammatical structures (Liao, 2006; Qassem, 2021; Yulita, 2021). Although various factors can influence learners' willingness to learn English through translation, the strategies for doing so remain common among EFL learners.

Additionally, as the AI-driven era is a present progressing tense, many translation tools, such as MT, a digital device to translate texts from one language into another without human intervention (Kornacki, 2018; Potapova et al., 2022), revolutionize their translation quantity and quality. Thanks to the development of MT, students strengthened their language skills after using it to assist their foreign language learning. In recent years, many tech tycoons such as Google, Microsoft, and DeepL introduced their translation apps featuring the neural machine translation (NMT) system, enabling translation apps to generate more accurate and higher-quality translations (Caswell & Liang, 2020; Forman, 2023; Mohan & Skotdal, 2021; Pitman, 2021). OpenAI's app version of ChatGPT could even converse with users and understand their translation requests through a natural language processing tool, which enables users to obtain a satisfying translated production (OpenAI, 2023; Timothy, 2023). With the assistance of modern translation apps, foreign language learners now can comprehend messages written in other languages, improving skills in both native and foreign languages. Even with numerous MT options, this study was limited to translation apps that leverage mobile devices, such as smartphones and tablets, to translate messages from one language to another.

### B. Post-Editing Strategies

Metacognitive skills, including planning, self-monitoring, and self-revision, can be used to produce a well-translated work (Shreve, 2009; Whyatt & Naranowicz, 2020) and to learn languages. Indarti (2024) pointed out that initially, translators would use planning skills to organize their post-editing process and decide the necessary strategies to apply to the specific genre of translation. While translating, translators were aware of mistakes in the translated content by utilizing self-monitoring skills and ensured that the emerging translation reached the expected quality by using self-revision skills (Indarti, 2024; Whyatt & Naranowicz, 2020). During language learning, students often detect MT's mistranslations using self-monitoring skills. Through the self-monitoring strategies, students could comprehend the context, cultivate their critical thinking, and develop problem-solving abilities, facilitating them to build an applicable way of study (Araghian et al., 2018; Cárdenas, 2018; O'Malley & Chamot, 1990; Yang & Wang, 2023). Jia and Lai (2022) maintained that the quality of MT production is not as accurate as human translation. Therefore, post-editors had to follow the criteria of each translation genre to offer a steady translation quality for target readers. In other words, post-editors were responsible for guaranteeing that the intended meaning of the source language was conveyed correctly in MT output and that errors in the target language were corrected (Michael et al., 2016; do Carmo, 2017). Moreover, depending on varied genres of texts, post-editors adopted different post-editing strategies, namely, light post-editing and full post-editing (Jia & Sun, 2022; Koponen, 2016; Krings, 2001; Massardo et al., 2016), and utilized specific strategies based on the expected results of the translation. Massardo et al. (2016) argued that light post-editing strategies aimed to provide a semantically correct translation without any omitted information; full post-editing strategies aimed to provide a semantically, syntactically, grammatically, and stylistically acceptable translation. Given these concepts, Chang (2020)

and Shih (2021) indicated that post-editors employed light post-editing strategies, such as the correction of spelling, grammar, and punctuation, to amend linguistic-related errors in MT. Alternatively, post-editors amended pragmatic and affective errors in MT with full post-editing strategies involving correcting linguistic-related errors, supplementing information, and using appealing descriptions and tone (Chang, 2020; Shih, 2021). If a post-editor effectively uses post-editing strategies, it will optimize the translation quality and enable target readers to absorb the information easily.

Although MT greatly benefits the post-editing process, learners still need to develop their post-editing capabilities to provide a more accurate production. Students nowadays tend to use post-editing strategies rather than translating with MT or from scratch (Harto et al., 2022); in using post-editing strategies and other tools, such as dictionaries, search engines, etc. (Chang, 2022) to revise the MT raw output; their translation productivity would then increase and the quality of translated texts would become superior, which finally represented that the overall translation was fluent and accurate (Cui et al., 2023; Jia & Lai, 2022; Tavares et al., 2023). In addition, students also improve their English and post-editing skills from post-editing practices (Harto et al., 2022; Jia & Lai, 2022; Varela Salinas & Burbat, 2023). As students post-edited different topics of texts, they were more sensitive to the specific post-editing strategies they used, weighing their words more precisely. They sometimes could still comprehend the context with limited linguistic knowledge and effectively communicate the message from the source language to the target language without analyzing the structures of different languages.

Nevertheless, students may not translate well while using MT post-editing strategies. Liu et al. (2022) indicated that if students solely used MT-generated content without revision, they could not progress in English and post-editing skills. Even though students adopted MT post-editing, students who were deficient in English and lacked translation time during the post-editing practices produced subpar translations that were frequently translated with a direct transfer strategy (Jia & Lai, 2022; Varela Salinas & Burbat, 2023; Yu & Lu, 2023). Therefore, excellent language and post-editing skills are vital for students who want to produce superior translations.

### *C. Perceptions of Learning English With Translation Apps*

As translation apps have progressed from the rule-based system to the NMT system, they have now even incorporated AI to assist with translation. The translation apps, including Google Translate, Microsoft Translator, Reverso Context, Speak and Translate, etc., were utilized in English learning courses. Lake and Beisly (2019) stated that translation apps could be used to train English-speaking skills. During the speaking practice with translation apps, students had more conversations with their classmates and teachers in that utilizing translation apps allowed learners to understand and review the content they had learned before; meanwhile, this created a bilingual environment and helped students engage in the class (Lake & Beisly, 2019). Moreover, translation apps are often used in vocabulary learning. Alotaibi and Salamah (2023) illustrated that students realized how to use words and expressions wisely and reduce the number of omissions, referring to untranslated words or parts, by contrasting the source and target translation contexts from the translation app. After that, the translation results they post-edited became more accurate and acceptable. Furthermore, Bin Dahmash (2020) maintained that students used Google Translate to practice grammar, pronunciation, spelling, and vocabulary. Through its camera feature and a built-in dictionary, students could transfer the paragraph of the source language into the target language and search for the vocabulary they did not understand, enabling them to comprehend the context thoroughly. Overall, the functions of translation apps diversify learners' language learning experiences and facilitate them to improve their language learning performances.

Besides, mobile learning was often credited with boosting learners' motivation, sustainability, and autonomy in language learning since the learning process was more entertaining and attractive than conventional teaching materials (Jeong, 2022; Kacatl & Klímová, 2019; Lu & Xiong, 2023; Metruk, 2021; Mujiono, 2023). In particular, the use of translation apps in English learning has shown positive impacts, enhancing students' motivation, engagement, and language proficiency in both language learning and translation training environments (Alotaibi & Salamah, 2023; Lake & Beisly, 2019; Ross et al., 2021). Alotaibi and Salamah (2023) emphasized the importance of educators teaching students how to effectively use translation apps and improve translation quality through post-editing. Moreover, thanks to the assistance of translation apps, students are highly motivated and relieved when using translation apps to improve their language skills, such as speaking, writing, and pronunciation skills (Alotaibi & Salamah, 2023; Bin Dahmash, 2020; Ross et al., 2021). In short, the positive attitudes toward translation apps from students and educators highlight translation apps' effectiveness in enhancing students' motivation and improving their language skills, further solidifying irreversible translation apps' role as valuable resources in modern language learning.

## III. METHODOLOGY

### *A. Context*

This study adopted a quantitative approach using a questionnaire to investigate students' use of translation apps in English learning, their perceptions, and their post-editing strategies. The instrument was adapted from the ITLS (Liao, 2006), perceived usefulness of machine translation (Yang & Mustafa, 2022), and satisfaction with translation outcomes (Hong & Lee, 2021), and further refined through a literature review. A pilot test confirmed strong reliability ( $\alpha = 0.936$ ).

Following revisions, the formal survey was administered from August 24 to October 27, 2023, via Google Forms to Taiwanese university students who used translation apps for English learning.

### *B. Background Analysis*

The study collected 519 questionnaires, but fourteen samples were excluded because the respondents were either not university students, had never used translation apps for English learning, or were not enrolled in a university in Taiwan. Consequently, only 505 responses were included in the data analysis, which utilized the mean, standard deviation, independent t-test, and one-way ANOVA. The final questionnaire demonstrated high reliability ( $\alpha = 0.946$ ), with subscale reliability values of 0.914, 0.933, and 0.902. Of the 505 respondents, 75.6% were female ( $N = 382$ ), and 24.4% were male ( $N = 123$ ). Most participants were enrolled in Universities of Science and Technology (66.7%,  $N = 337$ ), followed by General Universities (32.7%,  $N = 165$ ), with a small proportion from other institutions (0.6%,  $N = 3$ ). In terms of academic standing, seniors constituted the largest group (45.7%,  $N = 231$ ), followed by juniors (20.2%,  $N = 102$ ), sophomores (13.7%,  $N = 69$ ), and first-year students (13.5%,  $N = 68$ ). An additional 6.9% of respondents ( $N = 35$ ) were categorized as “other”.

In this study, students’ proficiency levels were categorized, using the CEFR framework, as preliminary (A1–A2), intermediate (B1), and proficient (B2–C2). The largest proportion of students fell within the preliminary level (43.6%,  $N = 220$ ), followed by the intermediate level (34.1%,  $N = 172$ ). Additionally, 12.9% ( $N = 65$ ) reported having no English certification, and 9.5% ( $N = 48$ ) were classified as proficient. In terms of translation app usage, participants were allowed to select up to three apps. Based on the total number of selections ( $N = 1,150$ ), the most frequently used tools were Google Translate (42.5%,  $N = 489$ ) and ChatGPT (26%,  $N = 299$ ), followed by Apple Translate (21.9%,  $N = 252$ ), DeepL Translate (4.2%,  $N = 48$ ), Microsoft Translator (2.7%,  $N = 31$ ), and Reverso Translation (0.5%,  $N = 6$ ).

## IV. RESULTS

### *A. The Use of Translation Apps in English Language Learning*

Table 1 presents the overall mean and standard deviation of students using translation apps for English learning. The overall mean score was 3.55, with individual scores ranging from 2.97 to 4.25. University students primarily used translation apps to comprehend articles, clarify English structure, learn pronunciation, expand vocabulary, and translate texts.

Regarding reading comprehension, five items (1, 2, 3, 11, and 12) specifically focused on students’ use of translation apps for this purpose. Among these, item 11 ( $M = 3.83$ ) and item 3 ( $M = 3.57$ ) received relatively high scores, indicating that students often relied on translation apps to translate English web content into Chinese while reading, which helped them better understand the context. However, item 1 ( $M = 2.97$ ) showed that students did not typically use translation apps before reading English articles.

Vocabulary learning was another prominent area where translation apps were widely used. This is reflected in several items, including item 5 ( $M = 3.72$ ), item 7 ( $M = 4.22$ ), and item 8 ( $M = 4.25$ ). Students frequently utilized translation apps as modern dictionaries, as these apps allowed them to search for unknown words easily. Students could better understand word usage in specific contexts by comparing content between the source and target languages.

In addition to reading and vocabulary, translation apps were also helpful for pronunciation practice. The mean score in this area was 3.89, highlighting the effectiveness of these apps in improving students’ pronunciation skills. Furthermore, translation apps enhanced translation speed and overall efficiency, as students could use features such as document translation. By uploading an entire file, they would receive a complete, translated document, saving time and making the translation process more efficient. This benefit is reflected in items 14 ( $M = 3.63$ ), 15 ( $M = 3.79$ ), and 20 ( $M = 3.75$ ).

TABLE 1  
MEAN AND STANDARD DEVIATION: USE OF TRANSLATION APPS IN ENGLISH LEARNING

Item	Statement	M	SD
1	I use translation apps first to understand the content before reading English articles.	2.97	1.26
2	I use translation apps after reading English articles to check if I comprehend the context.	3.41	1.11
3	I use translation apps while reading English articles.	3.57	1.12
4	I write down my ideas in Chinese and translate them into English with translation apps, which helps me complete my English composition.	3.00	1.25
5	I use translation apps to clarify the differences and similarities of words between Chinese and English.	3.72	0.97
6	I use translation apps to clarify the differences and similarities in grammar between Chinese and English.	3.39	1.08
7	I use translation apps to look up English vocabulary.	4.22	0.87
8	I use translation apps to replace the traditional dictionary.	4.25	0.94
9	I use translation apps to learn English pronunciation.	3.89	1.03
10	I use translation apps to learn English idioms and phrases.	3.37	1.10
11	I use translation apps to translate an English web page into Chinese.	3.83	1.12
12	I use the image translation function in translation apps to learn English.	3.57	1.16
13	I use the real-time transcription function in translation apps to understand English conversations.	3.08	1.27
14	I use the document translation function in translation apps to accelerate the speed of the translation process.	3.63	1.12
15	I use translation apps to finish my English assignments more quickly.	3.79	1.11
16	I use translation apps to check my English assignments.	3.60	1.14
17	I use translation apps to better recall the content of English lessons.	3.39	1.09
18	I use translation apps to review the English vocabulary I have learned.	3.43	1.15
19	I use translation apps to improve my translation skills.	3.48	1.07
20	I use translation apps to translate texts effectively.	3.75	0.99
21	I depend on the translation produced by translation apps to understand the content of English lessons.	3.44	1.15
22	I depend on translation apps to learn English.	3.34	1.11
Total		3.55	1.10

Moreover, the t-test was used to examine differences by gender and university type, while the one-way ANOVA was conducted to analyze variations based on English proficiency levels. The results indicated no significant relationship between gender or university type and the use of translation apps, with  $p$  values for gender ( $p = .256$ ) and university type ( $p = .306$ ) both exceeding the 0.05 significance threshold. However, the one-way ANOVA results, as shown in Table 2, revealed a significant difference in translation app usage based on English proficiency levels ( $p = .000 < .05$ ). Post hoc analysis using Scheffe's test further clarified the differences between groups, showing that students at the preliminary level used translation apps significantly more often than those at the intermediate ( $MD = .2440$ ,  $p = .003$ ) and proficient levels ( $MD = .4809$ ,  $p = .000$ ).

TABLE 2  
RESULTS OF ONE-WAY ANOVA FOR USE OF TRANSLATION APPS IN ENGLISH LEARNING AND ENGLISH PROFICIENCY LEVEL

	SS	df	MS	F	Sig.
Between	11.762	3	3.921	9.504	.000***
Within	206.684	501	0.413		
Total	218.446	504			

Note. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

### B. Post-Editing Strategies Students Adopted After Using Translation Apps

As shown in Table 3, the overall mean and standard deviation were 3.49 and 1.07, respectively. The mean scores ranged from 3.19 to 3.69, and the standard deviation for all items exceeded one, indicating that the data distribution was fairly concentrated. The results also revealed that university students often corrected vocabulary errors, added supplementary information, and fixed incorrect expressions in the target language after using translation apps, positively impacting their learning outcomes.

This study categorized post-editing strategies into light post-editing and full post-editing. Light post-editing primarily involved correcting linguistic and grammatical errors, while full post-editing addressed syntactic, semantic, and stylistic mistranslations. Questionnaire items 23 to 26 represented light post-editing strategies, while items 27 to 29 reflected full post-editing strategies. Among the light post-editing strategies, students frequently corrected vocabulary errors in the translations produced by apps, as seen in item 23 ( $M = 3.60$ ). Regarding full post-editing, students focused on improving translation quality by adding additional information and correcting misused target language expressions, as reflected in items 27 ( $M = 3.54$ ) and 29 ( $M = 3.53$ ).

The use of post-editing strategies also led to improvements in students' overall translation skills. After receiving an initial translation from the apps, students spent less time on the first version of the translation and more time enhancing the quality, mainly when translating between Chinese and English. This was reflected in items 31 ( $M = 3.66$ ) and 32 ( $M$

= 3.60). In other words, translation efficiency improved after students revised the output generated by translation apps, as evidenced in item 34 ( $M = 3.69$ ).

TABLE 3  
MEAN AND STANDARD DEVIATION: POST-EDITING STRATEGIES

Item	Statement	M	SD
23	I correct the vocabulary in the translation done by translation apps.	3.60	1.09
24	I correct the grammar and word order in the translation done by translation apps.	3.50	1.09
25	I correct the use of punctuation in the translation done by translation apps.	3.33	1.13
26	I correct the use of terminology in the translation done by translation apps.	3.19	1.15
27	I add supplementary information or explanations in the translation done by translation apps to ensure the completeness of the translation work.	3.54	1.09
28	I correct the cultural references and metaphorical expressions in the translation done by translation apps.	3.25	1.06
29	I correct wrong expressions or presentations that do not meet the actual use of the target language in the translation done by translation apps.	3.53	1.05
30	I understand the English structure better after revising the translation work done by translation apps.	3.50	1.04
31	I can accomplish my translation tasks more quickly after revising the translation work done by translation apps.	3.66	1.01
32	My English-Chinese and Chinese-English translation quality improved after revising the translation work done by translation apps.	3.60	1.02
33	My English-Chinese and Chinese-English translation competence improved after revising the translation work done by translation apps.	3.52	1.02
34	My effectiveness in translation was enhanced after revising the translation work done by translation apps.	3.69	1.03
Total		3.49	1.07

Although the statistical results showed no significant differences in post-editing strategies based on gender or university type, Table 4 shows that post-editing strategy use differed significantly among students with different English proficiency levels, as indicated by a p-value of 0.003 ( $p < .05$ ). The F-value of 4.791 suggests a moderate effect size, indicating that proficiency level has a meaningful impact on post-editing strategy use. Accordingly, Scheffe's post hoc test was employed, revealing that students at the intermediate ( $MD = .2351$ ,  $p = .04$ ) and proficient levels ( $MD = .3900$ ,  $p = .026$ ) used post-editing strategies more frequently than lower-level students. However, the mean differences (MD) between these groups suggest varying degrees of strategy use. The results also imply that students at the lower proficiency level may rely less on post-editing strategies, possibly due to limited linguistic awareness or editing skills. Moreover, the relatively large within-group variance ( $SS = 320.419$ ,  $MS = 0.64$ ) suggests that individual differences in post-editing strategy use exist within each proficiency level. The findings highlight the need to provide targeted post-editing instruction, especially for lower-proficiency students, to help them develop effective revision strategies when using translation apps.

TABLE 4  
RESULTS OF ONE-WAY ANOVA FOR POST-EDITING STRATEGIES AND ENGLISH PROFICIENCY LEVEL

	SS	df	MS	F	Sig.
Between	9.192	3	3.064	4.791	.003**
Within	320.419	501	0.64		
Total	329.61	504			

Note. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

### C. Students' Perceptions of Using Translation Apps as an English Learning Supplement

The mean and standard deviation values in Table 5 reflected students' perceptions. The overall mean was 3.49, with individual scores ranging from 3.00 to 3.97. Items 35 to 43 focused on students' perceptions of post-editing strategies, while items 44 to 47 examined their perceptions of learning English with translation apps.

Concerning adopting post-editing strategies after receiving app-generated outputs, students expressed positive attitudes toward using these strategies. They reported improved comprehension of contexts after revising materials produced by translation apps, as shown by the high mean score of 3.79 in item 40. Students viewed translation apps favorably when learning about them. According to items 45 ( $M = 3.70$ ) and 47 ( $M = 3.97$ ), students experienced reduced anxiety when using translation apps to learn English and considered them practical tools for language learning.

However, students held neutral views regarding translation apps' quality and accuracy, as indicated by the mean scores in items 36 ( $M = 3.00$ ) and 37 ( $M = 3.10$ ). They did not feel that the translation output fully met their expectations, maintaining a balanced, neutral perspective on the overall quality of translations provided by the apps.

TABLE 5  
MEAN AND STANDARD DEVIATION: STUDENTS' PERCEPTIONS

Item	Statement	M	SD
35	I think I can notice the mistranslations in the translation apps.	3.41	1.01
36	I think the translation apps' results are exactly as I expected.	3.00	0.92
37	I believe in the translation results that the translation apps have provided.	3.10	0.98
38	I think I have a deeper understanding of the different types of texts after revising the translation work done by translation apps.	3.54	0.89
39	I think I can translate more accurately after revising the translation work done by translation apps.	3.57	0.91
40	I think I comprehended the context better after revising the translation work done by translation apps.	3.79	0.90
41	I am satisfied with the accuracy of the final work after revising the translation work done by translation apps.	3.49	0.90
42	I am satisfied with the fluency and readability of the final work after revising the translation work done by translation apps.	3.57	0.91
43	I am satisfied with the terminologies in the final work after revising the translation work done by translation apps.	3.40	0.92
44	I think using translation apps enhances my motivation and interest in English learning.	3.42	0.98
45	I think using translation apps reduces my learning fear of learning English.	3.70	1.00
46	I think using translation apps can increase my opportunities to interact with native speakers.	3.44	1.09
47	I think translation apps are good English learning supplements.	3.97	0.88
Total		3.49	0.95

Additionally, the study examined the relationships among three dependent variables: the use of translation apps in English learning, post-editing strategies, and students' perceptions. As presented in Table 6, the results of descriptive statistics and Pearson's correlation revealed significant relationships between these variables ( $p = .000$ ), indicating robust relationships rather than chance occurrences. A moderate positive correlation was identified between the use of translation apps and students' perceptions ( $r = .586$ ), highlighting that students who use translation apps more frequently tend to have a more favorable perception of them. Likewise, a moderate correlation exists between post-editing strategies and students' perceptions ( $r = .524$ ), indicating that students who engage more in post-editing tend to view the translation apps more positively. However, the positive correlation between the use of translation apps and post-editing strategies was relatively weak ( $r = .367$ ) compared to the other relationships. This suggests that merely using translation apps does not strongly predict how frequently students engage in post-editing. Other factors, such as learners' proficiency level, may influence post-editing behavior.

Since students' perceptions correlate more strongly with both app usage and post-editing strategies, this could indicate that positive attitudes toward translation apps may encourage both frequent usage and engagement in refining translations. On the other hand, the weaker correlation between app use and post-editing may suggest that some students rely on raw translations without making substantial edits while others actively refine their output. The standard deviations (SDs) are relatively high (1.10 for app use, 1.07 for post-editing strategy, and 0.95 for perceptions), indicating an inconsistency in how students interact with translation apps and their post-editing behaviors, suggesting individual differences in how students adopt and integrate translation tools into their learning.

TABLE 6  
DESCRIPTIVE STATISTICS AND CORRELATIONS FOR STUDY VARIABLES

Variables	N	M	SD	1	2	3
1. Use of Translation Apps in English Learning	505	3.55	1.10	-	.367**	.586**
2. Post-Editing Strategies	505	3.49	1.07	.367**	-	.524**
3. Students' Perceptions	505	3.49	0.95	.586**	.524**	-

Note. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

## V. DISCUSSION AND CONCLUSION

### A. Discussion and Conclusion

With the increasing prevalence of translation apps, teachers and students have begun incorporating them into language teaching and learning (Hoi, 2020; Polakova & Klimova, 2023). This study further highlights that university students in Taiwan frequently use Google Translate and ChatGPT as their preferred translation tools. The results also indicated that students preferred reading and translating the original online articles simultaneously. With the various functions of translation apps, students could analyze sentence structures in both languages, look up new vocabulary, and practice pronunciation. These apps made their workflow faster and made them more effective learners during translation. Translation apps had a positive impact on students' English learning experiences, as they helped improve their skills in multiple areas and learning outcomes, which aligned with previous research (Alaboud, 2022; Alhaisoni & Alhaysony, 2017; Bahri & Mahadi, 2016; Bin Dahmash, 2020; Khan et al., 2021; Wongsuriya, 2020).

Besides, the study indicated that students gained a better understanding of the context when learning to correct different types of translation errors from the raw output of these apps. At the same time, they were able to reduce their anxiety during the English learning process. Kim and Cha (2023) reported similar findings, showing that students better understood reading original texts and felt less intimidated when speaking English. Furthermore, the findings revealed a correlation between students' use of translation apps and their English proficiency levels. Students at the preliminary level relied more heavily on these apps for language learning. In contrast, intermediate and proficient students used apps less frequently as they could comprehend most content without assistance, consistent with Khan et al.'s (2021) research.

Although translation apps could be used for language learning, students still needed to use their metacognition strategies to notice, reflect and revise the outcomes of translations, which aligned with the findings of Alhaisoni and Alhaysony (2017). Their research noted that students often cross-checked word meanings in dictionaries when using translation apps for vocabulary learning. Further, this study revealed that the light post-editing strategies students frequently used included correcting words and grammar while their full post-editing strategies often involved adding supplementary information and amending inaccurate expressions in the target language. Moreover, the results showed that English proficiency influenced students' post-editing strategies, consistent with several studies (Chung, 2020; Niño, 2008; Shin & Chon, 2023). It was observed that intermediate and proficient students employed post-editing strategies more frequently than those at preliminary levels. Stapleton and Leung (2019) argued that learners' proficiency in a second language enabled more advanced students to identify a broader range of errors and apply the appropriate post-editing strategies. Similarly, Chung (2020) noted that learners with lower proficiency tended to correct only lexical errors, whereas those with higher proficiency could address more complex translation issues. This suggested that proficient learners possessed sufficient linguistic knowledge of both languages, allowing them to easily translate between both languages.

### B. Limitations and Suggestions

This research primarily examined Taiwanese tertiary students' use of translation apps in English learning, their post-editing strategies, and their perceptions of translation apps as a supplement to language learning. However, there are several limitations that future research should address.

First, as Timothy (2023) highlighted, the interactive nature of ChatGPT allowed users to customize translations and provide feedback for adjustments. This differs significantly from traditional translation tools such as Google Translate, Microsoft Translator, and DeepL Translate. Therefore, future studies might focus on investigating one particular AI translation app to gain a more focused understanding of its unique capabilities. Second, the influence of linguistic differences across languages should be considered. Different languages follow distinct grammatical rules, which may lead to variations in the use of post-editing strategies. For example, Yang (2018) pointed out that Chinese-to-English translations often require correcting grammatical errors and addressing omissions. In contrast, English-to-Chinese translations more frequently involve using established terms and correcting mistranslated words. Future research could explore post-editing strategies in specific language pairs, such as Chinese-to-English or English-to-Chinese, to better understand these variations.

Despite these limitations, this study provides a foundational understanding of EFL learners' use of translation apps and post-editing strategies. It also offers valuable insights into students' positive perceptions of translation apps as practical tools in their English learning experiences. Hence, based on these findings, it is recommended that language teachers integrate translation apps with explicit post-editing instruction to help students refine accuracy, fluency, and contextual understanding, leading to more effective language learning and strengthening their overall language proficiency.

### REFERENCES

- [1] Alaboud, A. (2022). The positive effect of translation on improving reading comprehension among female Arabic learners of English as foreign language. *Arab World English Journal*, 13(2), 424-436. <https://doi.org/10.24093/awej/vol13no2.29>
- [2] Alhaisoni, E., & Alhaysony, M. (2017). An investigation of Saudi EFL university students' attitudes towards the use of Google Translate. *International Journal of English Language Education*, 5(1), 72-82.
- [3] Alotaibi, H., & Salamah, D. (2023). The impact of translation apps on translation students' performance. *Education and Information Technologies*, 28(8), 10709-10729. <https://doi.org/10.1007/s10639-023-11578-y>
- [4] Araghian, R., Ghonsooly, B., & Ghanizadeh, A. (2018). Investigating problem solving strategies of translation trainees with high and low levels of self-efficacy. *Translation, Cognition & Behavior*, 1(1), 74-97. <https://doi.org/10.1075/tcb.00004.ara>
- [5] Bahri, H., & Mahadi, T. S. T. (2016). Google Translate as a supplementary tool for learning Malay: A case study at University Sains Malaysia. *Advances in Language and Literary Studies*, 7(3), 161-167.
- [6] Bin Dahmash, N. (2020). 'I can't live without Google Translate': A close look at the use of Google Translate App by second language learners in Saudi Arabia. *Arab World English Journal*, 11(3), 226-240. <https://doi.org/10.24093/awej/vol11no3.14>
- [7] Cárdenas, A. M. (2018). Tackling intermediate students' fossilized grammatical errors in speech through self-evaluation and self-monitoring strategies. *Profile: Issues in Teachers' Professional Development*, 20(2), 195-209. <https://doi.org/10.15446/profile.v20n2.67996>
- [8] Caswell, I., & Liang, B. (2020). *Recent advances in Google Translate*. Retrieved March 12, 2023, from <https://ai.googleblog.com/2020/06/recent-advances-in-google-translate.html>

- [9] Chang, L. C. (2022). Chinese language learners evaluating machine translation accuracy. *The JALT CALL Journal*, 18(1), 110-136. <https://doi.org/10.29140/jaltcall.v18n1.592>
- [10] Chang, Y. T. (2020). *Differences in machine translation post-editing (MTPE) strategies between technical and tourism texts: Analysis from the perspective of register theory* [Unpublished master's thesis]. National Kaohsiung University of Science and Technology.
- [11] Chung, E. S. (2020). The effect of L2 proficiency on post-editing machine translated texts. *The Journal of Asia TEFL*, 17(1), 182-193. <http://dx.doi.org/10.18823/asiatefl.2020.17.1.11.182>
- [12] Cui, Y., Liu, X., & Cheng, Y. (2023). A Comparative study on the effort of human translation and post-editing in relation to text types: An eye tracking and key-logging experiment. *SAGE Open*, 13(1), 1-15. <https://doi.org/10.1177/21582440231155849>
- [13] do Carmo, F. E. M. (2017). *Post-editing: A theoretical and practical challenge for translation studies and machine learning* [Unpublished doctoral dissertation]. University of Porto.
- [14] Edelia, A. D., & Maharsi, I. (2022). A survey on translation as a learning strategy by EFL higher education students in English learning. *Pedagogy: Journal of English Language Teaching*, 10(2), 111-122. <https://doi.org/10.32332/joelt.v10i2.4809>
- [15] Forman, S. (2023). *DeepL*. Retrieved November 8, 2023, from <https://research.contrary.com/reports/deepL>
- [16] Girletti, S. (2022). Working with pre-translated texts: Preliminary findings from a survey on post-editing and revision practices in Swiss corporate in house language services. In *Proceedings of the 23rd Annual Conference of the European Association for Machine Translation* (pp. 271–280). Switzerland: European Association for Machine Translation.
- [17] Harto, S., Hamied, F. A., Musthafa, B., & Setyarini, S. (2022). Exploring undergraduate students' experiences in dealing with post-editing of machine translation. *Indonesian Journal of Applied Linguistics*, 11(3), 696-707. <https://doi.org/10.17509/ijal.v11i3.42825>
- [18] Hoi, V. N. (2020). Understanding higher education learners' acceptance and use of mobile devices for language learning: A Rasch-based path modeling approach. *Computers & Education*, 146, 1-15. <https://doi.org/10.1016/j.compedu.2019.103761>
- [19] Hong, J., & Lee, I. J. (2021). A satisfaction survey on the human translation outcomes and machine translation post-editing outcomes. *International Journal of Advanced Smart Convergence*, 10(2), 86-96. <https://doi.org/10.7236/IJASC.2021.10.2.86>
- [20] Indarti, D. (2024). Investigating the metacognitive strategies during post-editing translation process: An application of think-aloud protocols (TAP). *JOLLT Journal of Languages and Language Teaching*, 12(2), 765-778. <https://doi.org/10.33394/jollt.v12i2.10297>
- [21] Jeong, K. O. (2022). Facilitating sustainable self-directed learning experience with the use of mobile-assisted language learning. *Sustainability*, 14(5), 1-13. <https://doi.org/10.3390/su14052894>
- [22] Jia, Y., & Lai, S. (2022). Post-editing metaphorical expressions: Productivity, quality, and strategies. *Journal of Foreign Languages and Cultures*, 6(2), 28-43. <https://doi.org/10.53397/hunnu.jflc.202202004>
- [23] Jia, Y., & Sun, S. (2022). Man or machine? Comparing the difficulty of human translation versus neural machine translation post-editing. *Perspectives*, 31(5), 950-968. <https://doi.org/10.1080/0907676X.2022.2129028>
- [24] Kacetl, J., & Klímová, B. (2019). Use of smartphone applications in English language learning—A challenge for foreign language education. *Education Sciences*, 9(3), 1-9. <https://doi.org/10.3390/educsci9030179>
- [25] Khan, R. M. I., Kumar, T., Supriyatno, T., & Nukapangu, V. (2021). The phenomenon of Arabic-English translation of foreign language classes during the pandemic. *Ijaz Arabi Journal of Arabic Learning*, 4(3), 570-582. <https://doi.org/10.18860/ijazarabi.v4i3.13597>
- [26] Kim, H. S., & Cha, Y. (2023). The role of AI translators on reading comprehension. *Korean Journal of English Language and Linguistics*, 23, 38-58. <https://doi.org/10.15738/kjell.23.202301.38>
- [27] Koponen, M. (2016). Is machine translation post-editing worth the effort? A survey of research into post-editing and effort. *The Journal of Specialised Translation*, (25), 131-148.
- [28] Kornacki, M. (2018). *Computer-assisted translation (CAT) tools in the translator training process* (Vol. 58; B. Lewandowska-Tomaszczyk & Ł. Bogucki, Eds.). Berlin, Germany: Peter Lang.
- [29] Krings, H. P. (2001). *Repairing texts: Empirical investigations of machine translation post-editing processes* (G. S. Koby, Ed.). Kent, Ohio, United States: The Kent State University Press.
- [30] Lake, V. E., & Beisly, A. H. (2019). Translation apps: Increasing communication with dual language learners. *Early Childhood Education Journal*, 47(4), 489-496. <https://doi.org/10.1007/s10643-019-00935-7>
- [31] Liao, P. (2006). EFL learners' beliefs about and strategy use of translation in English learning. *RELC Journal*, 37(2), 191-215. <https://doi.org/10.1177/0033688206067428>
- [32] Lin, C. L., Liao, P. S., Chang, C. C., Shih, C. L., Chen, B. J., Chen, P. W., & Chin, C. C. (2021). *Fanyi jiaoyu ruhe mianlin AI de tiaozhan ji ruhe yunyong AI* [How Translation Education Faces the Challenges of AI and Uses AI]. *Compilation and Translation Review*, 14(1), 157-181. [https://doi.org/10.29912/CTR.202103\\_14\(1\).0006](https://doi.org/10.29912/CTR.202103_14(1).0006)
- [33] Liu, K., Kwok, H. L., Liu, J., & Cheung, A. K. F. (2022). Sustainability and influence of machine translation: Perceptions and attitudes of translation instructors and learners in Hong Kong. *Sustainability*, 14(11), 1-29. <https://doi.org/10.3390/su14116399>
- [34] Lu, Y., & Xiong, T. (2023). The attitudes of high school students and teachers toward mobile apps for learning English: A Q methodology study. *Social Sciences & Humanities Open*, 8(1), 1-11. <https://doi.org/10.1016/j.ssaho.2023.100555>
- [35] Massardo, I., van der Meer, J., O'Brien, S., Hollowood, F., Aranberri, N., & Drescher, K. (2016). *MT post-editing guidelines*. Amsterdam, The Netherlands: TAUS Signature Editions.
- [36] Metruk, R. (2021). The use of smartphone English language learning apps in the process of learning English: Slovak EFL students' perspectives. *Sustainability*, 13(15), 1-17. <https://doi.org/10.3390/su13158205>
- [37] Michael, C., Moritz, S., & Srinivas, B. (2016). *New directions in empirical translation process research: Exploring the CRITT TPR-DB* (1st ed.). Cham, Switzerland: Springer.
- [38] Mohan, K. D., & Skotdal, J. (2021). *Microsoft Translator: Now translating 100 languages and counting!* Retrieved June 12, 2023, from <https://www.microsoft.com/en-us/research/blog/microsoft-translator-now-translating-100-languages-and-counting/>
- [39] Mujiono. (2023). Mobile-assisted language learning intervention and its effect on English language proficiency of EFL learners: A meta-analysis. *Theory and Practice in Language Studies*, 13(5), 1124-1135. <https://doi.org/10.17507/tpls.1305.05>

- [40] Niño, A. (2008). Evaluating the use of machine translation post-editing in the foreign language class. *Computer Assisted Language Learning*, 21(1), 29–49. <https://doi.org/10.1080/09588220701865482>
- [41] O'Malley, J. M., & Chamot, A. U. (1990). *Learning strategies in second language acquisition*. Cambridge, England: Cambridge University Press.
- [42] OpenAI. (2023). *ChatGPT — Release notes*. Retrieved October 5, 2023, from <https://help.openai.com/en/articles/6825453-chatgpt-release-notes>
- [43] Pitman, J. (2021). *Google Translate: One billion installs, one billion stories*. Retrieved January 08, 2023, from <https://blog.google/products/translate/one-billion-installs/>
- [44] Polakova, P., & Klimova, B. (2023). Using DeepL translator in learning English as an applied foreign language—An empirical pilot study. *Heliyon*, 9(8), 1–7. <https://doi.org/10.1016/j.heliyon.2023.e18595>
- [45] Potapova, R., Potapov, V., & Kuzmin, O. (2022). Logistics translator. Concept vision on future interlanguage computer assisted translation. In S. R. M. Prasanna, A. Karpov, K. Samudravijaya, & S. S. Agrawal (Eds.), *Speech and Computer* (pp. 579–589). Cham, Switzerland: Springer.
- [46] Qassem, M. (2021). Translation strategy and procedure analysis: A cultural perspective. *Asia Pacific Translation and Intercultural Studies*, 8(3), 300–319. <https://doi.org/10.1080/23306343.2021.2003511>
- [47] Ross, R. K., Lake, V. E., & Beisly, A. H. (2021). Preservice teachers' use of a translation app with dual language learners. *Journal of Digital Learning in Teacher Education*, 37(2), 86–98. <https://doi.org/10.1080/21532974.2020.1800536>
- [48] Samardali, M. F. S., & Ismael, A. M. H. (2017). Translation as a tool for teaching English as a second language. *Journal of Literature, Languages and Linguistics*, 40, 64–69.
- [49] Shih, C.-L. (2021). Re-looking into machine translation errors and post-editing strategies in a Changing high-tech context. *Compilation and Translation Review*, 14(2), 125–166. [https://doi.org/10.29912/CTR.202109\\_14\(2\).0004](https://doi.org/10.29912/CTR.202109_14(2).0004)
- [50] Shin, D., & Chon, Y. V. (2023). Second language learners' post-editing strategies for machine translation errors. *Language Learning & Technology*, 27(1), 1–25. <https://hdl.handle.net/10125/73523>
- [51] Shreve, G. M. (2009). Recipient-orientation and metacognition in the translation process. In E. A. Nida, R. Dimitriu, & M. Shlesinger (Eds.), *Translators and their readers* (pp. 255–270). Brussels, Belgium: Les Editions du Hazard.
- [52] Stapleton, P., & Leung, B. K. K. (2019). Assessing the accuracy and teachers' impressions of Google Translate: A study of primary L2 writers in Hong Kong. *English for Specific Purposes*, 56, 18–34. <https://doi.org/10.1016/j.esp.2019.07.001>
- [53] Tavares, C., Tallone, L., Oliveira, L., & Ribeiro, S. (2023). The challenges of teaching and assessing technical translation in an era of neural machine translation. *Education Sciences*, 13(6), 1–19. <https://doi.org/10.3390/educsci13060541>
- [54] Thani, A. S., & Ageli, N. R. (2020). The use of translation as a learning strategy: A case study of students of the University of Bahrain. *International Journal of Linguistics, Literature and Translation*, 3(12), 87–101. <https://doi.org/10.32996/ijllt.2020.3.12.12>
- [55] Timothy, M. (2023). *How to use ChatGPT as a language translation tool*. Retrieved December 2, 2023, from <https://www.makeuseof.com/how-to-translate-with-chatgpt/>
- [56] Varela Salinas, M.-J., & Burbat, R. (2023). Google Translate and DeepL: Breaking taboos in translator training. Observational study and analysis. *Iberica*, (45), 243–266. <https://doi.org/10.17398/2340-2784.45.243>
- [57] Whyatt, B., & Naranowicz, M. (2020). A robust design of the translator's skill set: Evidence for transfer of metacognitive skills to intralingual paraphrasing. *The Interpreter and Translator Trainer*, 14(1), 1–18. <https://doi.org/10.1080/1750399X.2019.1617028>
- [58] Wongsuriya, P. (2020). Improving the Thai students' ability in English pronunciation through mobile application. *Educational Research Review*, 15(4), 175–185.
- [59] Yang, D. H. (2018). *A comparative study of strategic differences in Chinese English bidirectional post-MT editing: Use of 3C user manual as samples* [Unpublished master's thesis]. National Kaohsiung University of Science and Technology.
- [60] Yang, Y., & Wang, X. (2023). Predicting student translators' performance in machine translation post-editing: Interplay of self-regulation, critical thinking, and motivation. *Interactive Learning Environments*, 31(1), 340–354. <https://doi.org/10.1080/10494820.2020.1786407>
- [61] Yang, Z., & Mustafa, H. R. (2022). On postediting of machine translation and workflow for undergraduate translation program in China. *Human Behavior and Emerging Technologies*, 2022, 1–11. <https://doi.org/10.1155/2022/5793054>
- [62] Ying, B. T., Hoon, A. L., Halim, H. A., & Majtanova, M. (2018). Students' beliefs on translation strategy in learning German language. *Gema Online Journal of Language Studies*, 18(1), 69–86. <https://doi.org/10.17576/gema-2018-1801-05>
- [63] Yu, Z., & Lu, Y. (2023). Post-editing performance of English-major undergraduates in China: A case study of C-E translation with pedagogical reflections. In W. Hong & Y. Weng (Eds.), *17th International Conference on Computer Science and Education (ICCSE 2022)* (pp. 408–420). Singapore: Springer.
- [64] Yulita, D. (2021). The correlation of English proficiency level and translation strategies used by Indonesian EFL learners. *LLT Journal: A Journal on Language and Language Teaching*, 24(1), 240–248. <https://doi.org/10.24071/llt.v24i1.2812>



**Ya-Ting Zhan** was born on November 21<sup>st</sup>, 1999, in Taichung City, Taiwan. She received her bachelor's degree in Applied English from Chaoyang University of Technology, Taiwan, in 2022. In 2024, she earned her master's degree in Applied English from Chaoyang University of Technology. Her research interest lies in English learning, translation apps, and post-editing strategies.

**Hsiao-Tung Hsu** holds an MA in English for Specific Purposes (ESP) from the University of Warwick, UK (2002), and a PhD in Education from the University of Reading, UK (2007). She serves as an Assistant Professor at Chaoyang University of Technology (CYUT), Taichung, Taiwan. Her current research interests center on examining the relationship between AI tools and autonomous English language learning. Dr. Hsu's scholarly work in English Language Teaching (ELT) is dedicated to enhancing learners' language performance through learner-centered and collaborative pedagogical frameworks. Correspondence concerning this article should be addressed to [hthsu@cyut.edu.tw](mailto:hthsu@cyut.edu.tw)