



**IMPLEMENTING THE USE OF GOOGLE TRANSLATE WITH
GRAMMARLY TO ENHANCE THAI UPPER SECONDARY
SCHOOL STUDENTS' ENGLISH WRITING ABILITY**

**BY
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**A THESIS SUBMITTED IN PARTIAL FULFILLMENT
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Abstract

Correcting translation errors from Thai to English in machine translation outputs poses a significant challenge for Thai upper secondary school students. One potential solution is the integration of Google Translate with Grammarly, an AI-powered post-editing tool, into Thai EFL writing instruction. This study aims to (1) identify common writing errors made by Thai upper secondary students when using Google Translate to translate from Thai to English, (2) examine the impact of training in the combined use of Google Translate and Grammarly on students' writing performance, and (3) explore students' perceptions following the training. The research was conducted at a government school in Chiang Mai, Northern Thailand, using a pretest-posttest design with a sample of 18 tenth-grade students majoring in Arts-English. Data were collected through pre- and post-writing tests, questionnaires, and a post-training survey. The intervention involved instructional sessions focused on the effective use of Google Translate in conjunction with Grammarly. The results indicated that the students' pre-tests revealed eleven common types of writing errors: noun agreement, pronouns, determiners, prepositions, reference, word choice, wordy or unclear sentences, verb forms, conjunctions, maintaining a polite or professional tone, and punctuation (the least frequent). Following the training, students demonstrated statistically significant improvement in their post-writing test scores at the 0.05 level, reflecting enhanced writing performance and reduced translation-related errors. Additionally, most participants expressed positive attitudes toward the training, reporting increased writing confidence and recognition of the instructional value of integrating Google Translate with Grammarly. Pedagogical implications emerged, including the continued complexity of implementing a translanguaging-informed approach in Thai-English teacher-student interactions. Despite these encouraging outcomes, the study noted several limitations, such as the small sample size and time lost due to technical setup. These findings represent an initial step toward further research on the long-term impacts of AI-assisted writing instruction, the adaptability of AI tools across diverse linguistic and educational contexts, the broader role of AI in developing other English language skills in EFL environments, and the ethical considerations associated with increasing reliance on AI technologies.

(Total 274 pages)

Key Words: Machine Translation Post-Editing, Google Translate, Grammarly, English Writing Ability, EFL Thai Upper Secondary Students, Translation Errors, Training of Google Translate Use with Grammarly, Opinions towards the Training of Google Translate Use with Grammarly, The Use of Google Translate with Grammarly

Student's SignatureThesis Advisor's Signature

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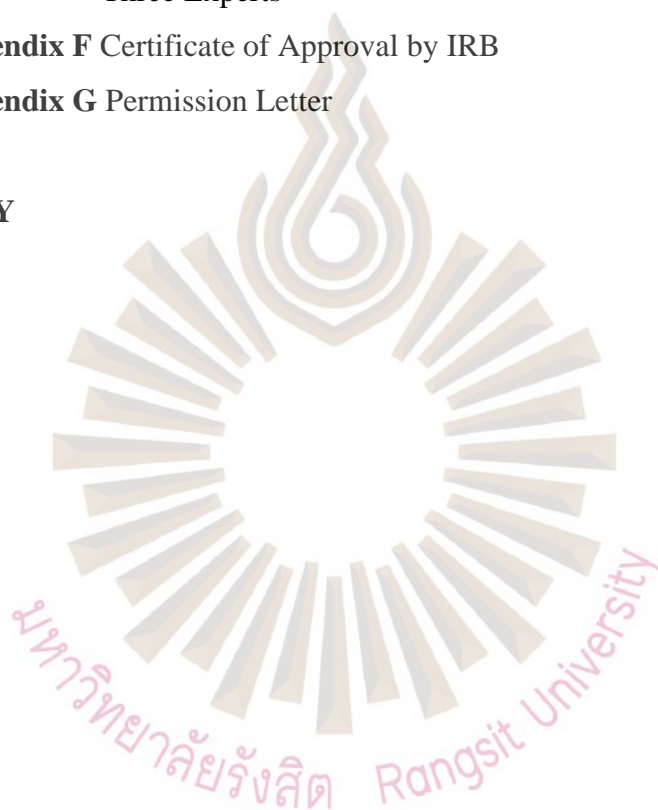
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CHAPTER 1

INTRODUCTION

Chapter 1 provides the background and statement of the problem. It emphasizes why research is needed to implement Google Translate with Grammarly to enhance Thai upper secondary school students' writing ability. Furthermore, it presents the background and statement of the problem, the research questions, the research objectives, the scope of the Study, the research context, and the definition of terms.

1.1 BACKGROUND AND STATEMENT OF THE PROBLEM

The desire to make a facet of life easier is always the driving force behind any improvement. As a result, it is not astounding that human efforts have been made to abolish the language barrier between languages, which has been a source of foreign language anxiety for people since the dawn of time. Translation is the main field to implement communication between cultures and across languages. The demand for accurate translations has never been greater in today's interconnected globe, where communication has no bounds. Under the big umbrella of translation terms, it aims to convey the same message in a different language. Hatim and Munday (2004) define translation as “the process of transferring a written text from the source language (SL) to the target language (TL).” The language to be translated is named the source language (SL), while the language to be arrived at is named the target language (TL).

The idea of integrating technology in language translation emerged in the 1990s when companies started to leverage statistical models that improved translation quality, which established Machine Translation (MT) software. The first machine translation systems were programmed to process language using bilingual dictionaries and grammar rules (Bowker, 2021). Many linguists and computer scientists worldwide were working to develop cheap software that could act as universal translators,

translating between many language pairs. This concept, which was once merely a dream, is one that Google, among others, wants to make a reality. Thus, Google is one of the leading providers of artificial intelligence-assisted language translation.

With recent artificial intelligence (AI) development, the neural machine translation system utilized by machine translation tools such as Google Translate (GT) has dramatically improved translation accuracy and quality. Octaviani & Yuyun (2018) stated, "Google Translate is the most popular neural translation machine among students. Its features can help facilitate and speed up the language translation process". As with all technological aspects, several educators studied the effects of using Google Translate in EFL classes, Moelyono, Murtisari, Kurniawan, & Thren. (2023) investigated first-year EFL students' autonomous utilization of GT in writing assignments in Indonesia. The researchers explored freshman students' awareness of GT's advantages and disadvantages and assessed their perceived relative reliance on the technology. Additionally, boosting confidence and convenience and serving as language scaffolding were identified as GT's main benefits, leading to students' reliance on technology. Laiche & Nemouchi (2021) conducted a study examining the impact of GT on EFL students' writing performance, which opted for an experimental design of 32 second-year students in Algeria. The results revealed that students' writing was slightly enhanced. They produced more unique words, fewer spelling mistakes, better arrangement of ideas, and longer sentences.

However, the utilization of Google Translate has become controversial due to its potential in the world. Samad, Farahdiba, & Sunra, (2023) stated in their study that "GT has some obstacles when using its features in the translation class, such as inaccurate translation results, the limitation on the number of words that could be included in the Google Translate typing feature, the disordered translation results produced by the document translation feature, the disordered translation results produced by the camera translation feature, and the speech translation feature's inability to detect voice correctly." Additionally, Tumbal, Liando, & Olii (2021) and Axelina & Setiawan (2021) found that while GT provides many benefits, it can also make students lazy and dependent on EFL learning classes.

The quality of GT translation has evolved to an understandable extent, but its users still need to use it carefully. Because GT does not provide grammar rules but is based on algorithms on statistical analysis, GT does not understand the meaning of words but translates them according to the pattern of a hundred million documents for the best result (Putri & Ardi, 2015). Furthermore, GT cannot understand the contextual meaning, which is beyond the meaning, which caused translation errors, according to Pojprasat (2007) and Wongranu (2017)'s errors translation model where Thai EFL students took a session on the topic of translation between Thai and English by using Google Translate. The errors were divided into two categories: syntactic errors and semantic errors. Syntactic errors were the most common, suggesting that students frequently made grammatical mistakes during translation. Semantic errors followed in frequency. Even with machine translation, numerous students selected inappropriate words during the translating process. Google Translate's initial outputs were fairly inadequate, particularly at the level of sentences and paragraphs. Tongpoon-Patanasorn & Griffith (2020) also investigated the quality of abstracts translated from Thai, the user's native language, into English, the target language, by assessing their comprehensibility and usability levels and analyzing common types of errors. Two experts evaluated them using coding schemes. The findings indicated that both comprehensibility and usability were rated as moderate overall. This suggests that the quality of the abstracts translated by Google Translate may not fulfill the language standards required for academic writing. The most common errors generated by Google Translate involved capitalization, punctuation, and sentence fragmentation.

Machine translation output these days is reliable mainly concerning artificial intelligence. However, it can be mistranslated and does not always capture nuance or idioms. Post-editing is a surefire way to optimize content translation. One effective way to improve the quality of Machine-translated outputs is Machine Translation Post-Editing (MT-PE), the process whereby humans amend machine-generated translation to achieve an acceptable final product (Senez, 1998). It is an efficient way of combining machine-translated content and ensuring it has the highest possible accuracy.

The procedure in which Thai EFL university students post-edited their Google Translate outputs occurred in Chompurach's (2021) study. The students' behaviors with Google Translate in writing English paragraphs and post-editing were analyzed using six patterns. In pattern 6, the students used more than one tool to post-edit after reviewing the raw outputs from Google Translate. This could lead to a combination of Google Translate and other tools that can be used to develop EFL writing assignments.

In addition to the translation challenges presented by Google Translate, further research is being conducted using this tool in conjunction with another application. Hartono, Subhan, Hetami, & Anjaniputra (2022) explored this issue due to worries about the quality of translations in academic papers, which are often inaccurate and sound unnatural because authors rely on Google Translate. The integration of Google Translate with the Grammarly Application (GTG-com App) represented a developed translation solution that provided an efficient and quick way to translate academic papers from Indonesian to English. Grammarly is an Automatic Writing Evaluation (AWE) program that has become worldwide among English users. This is obvious from the large number of Grammarly's 30 million subscribers who use it daily to proofread and post-edit their EFL work (Grammarly Inc., 2021). The research employed a hybrid Google Translate engine followed by post-editing through the Grammarly application. The participants clearly found it easier to translate sentences from Indonesian to English with better accuracy and a more natural flow.

Therefore, integrating Google Translate with Grammarly into EFL writing teaching should be further explored. An EFL writing session tailored to the combination use of Google Translate with Grammarly as a Machine Translation Post-Editing tool can be efficient in helping to translate texts from Thai to English more accurately in EFL students' writing assignments in Thailand.

1.2 RESEARCH OBJECTIVES

The study aims to

1.2.1 identify the writing errors of Thai upper secondary students caused by using Google Translate from Thai to English,

1.2.2 examine the effect of the training in Google Translate use with Grammarly on the Thai upper secondary students' EFL writing ability, and

1.2.3 explore the students' opinions after the training on the use of Google Translate with Grammarly to enhance their English writing ability.

1.3 RESEARCH QUESTIONS

In this study, based on the combination of Google Translate and Grammarly, the researcher attempts to find answers to the following questions:

1.3.1 What are the writing errors of Google Translate use from Thai to English for the Thai upper secondary students?

1.3.2 To what extent does the training in the use of Google Translate with Grammarly affect the Thai upper secondary students' EFL writing ability?

1.3.3 What are the students' opinions towards the training of Google Translate use with Grammarly to enhance their writing ability?

1.4 SCOPE OF THE STUDY

The population of this study is students from Chiang Mai, Thailand, who are studying at a government school at the secondary level in Northern Thailand.

The variables in this study are as follows:

Independent variable: Training on the Use of Google Translate with Grammarly

Dependent variable: Students' English Writing Ability

1.5 RESEARCH CONTEXT

This study provides empirical evidence of the high-secondary students' use of Google Translate when completing their assignments at the leading government school in Chiang Mai province, Thailand. Google Translate can be a helpful learning aid for students in numerous ways, from simple verification of word meanings to providing full-text translations. However, English teachers found that many clauses from Google's free service are unnatural, instantly translating Thai to English words. Writing skills are complex and require cognitive and linguistic abilities. Suffering from the foreignness of the language used, EFL students commit many errors when completing a particular essay.

This Government School is located in Chiang Mai Province, in the north of Thailand, and is supervised by the Chiang Mai Secondary Educational Service Area (SESA). It is a day school from grade 7 through grade 12. The total number of students in grade 10 is 260 students, divided into four academic groups: Science-Math, Math-English, English-Arts, and English-Second Language. The school has approximately 1,200 lower secondary and upper secondary students. The 12-grader students in the academic year 2021 received 25.56 average scores of national educational test results (O-NET) in English subject. The target participants are 18 tenth-grade students 16-17 years old, studying English as a second language in English-Arts major at this school. The students have used Google Translate in English classes to translate Thai to English written texts when they do English assignments.

1.6 DEFINITION OF TERMS

English Writing Ability refers to a person's English ability to express ideas, feelings, and thoughts to others in writing (Azhar, Rukun, Jama, Effendi, & Muskhir, 2021). In this study, English writing ability corresponds to the students who can formulate long sentences in 250 words in one paragraph regarding twelfth-grade Thai students' English Proficiency level B1 in the Common European Framework of Reference (CEFR) (Rangaphuk; Office of the Basic Education Commission (OBEC) Ministry of Education, 2014). Student's English writing ability is measured by the pre-writing and post-writing tests developed by the researcher (See the research methodology section in Chapter 3 and Appendix 1-3).

Google Translate (GT) is one of the most popular machine translations (MT), and it was launched by Google in 2006. GT has been used widely not only by Internet users (Kumar, Barbier, Abbasi, & Liu, 2011) but also by language learners. In the academic context, GT has been widely used among language learners for decades (Sheppard, 2011).

Grammarly is the Automatic Writing Evaluation (AWE) software established in 2009, with its main manufacturing facility in San Francisco, California (Halim, Sharina, & Zur, 2022). Grammarly is among the best English grammar-checking or proofreading tools in its related innovation field (Rejeki, 2023).

Machine Translation Post-Editing (MT-PE) is how human translators correct errors of MT pieces of work or output (Senez, 1998). This study will focus on the sixth PE pattern in the students' post-editing the raw output from Google Translate and using another tool in English writing at a sentence level based on Chompurach (2021).

Training on the Use of Google Translate with Grammarly is a training session for students in the experimental group. They are trained in using Google Translate and Grammarly as developed translation tools to provide an effective and fast

solution for translating academic papers from the source language into English. This instruction can improve the quality of translation syntactically, lexically, and mechanically (Katsberg, 2012; Hartono et al., 2022; Guba, Awad, & Qub'a, 2024). (See Appendix 2, Section A-F)

Upper secondary students in Thailand are students aged 16 to 18 who attend high schools from M.4 (10 graders) to M.6 (12 graders) levels, where 'M' stands for Mattayomsuksa. In this study, the students study at the government school in the secondary level in Chiang Mai, Thailand.

Opinions towards the training of Google Translate use with Grammarly refer to feelings, thoughts, or ideas about EFL writing's benefits and improvements in the reflection of Google Translate's use with Grammarly. The opinions regarding the training in using Google Translate with Grammarly are measured by a post-training questionnaire adapted from Knowles (2021). (See Appendix 3)

Conceptual Framework.



Figure 1.1 Conceptual Framework

CHAPTER 2

LITERATURE REVIEW

To design the present study on implementing Google Translate with Grammarly to Enhance Thai Upper Secondary Students' English Writing Ability, this section will cover the theoretical foundations and other literature related to this study, the chapter is divided into 8 main headings: Google Translate in educational settings, the post-editing of machine translation outputs, Grammarly in ELT context, English writing ability, the translation errors produced by Google Translate, the training of Google Translate use with Grammarly, the students' opinions towards the training of Google Translate use with Grammarly, and the chapter summary.

2.1 GOOGLE TRANSLATE IN EDUCATIONAL SETTINGS

Over the last decade, the rapid development of translation software and Internet translation programs has significantly impacted translators and students. The quality of translation technologies is improving daily with enhanced data mining and search algorithms. Among the most familiar is Google Translate (GT). According to Komeili, Hendavalan, and Rahimi (2011), GT became the most popular machine translation because it provides over two hundred billion words and over one hundred languages worldwide.

This study is particularly relevant in the current educational context, as it examines how Google Translate can help EFL Thai upper secondary students enhance their English writing ability. Learning English for EFL Thai students is challenging, especially when facing long and complex English texts. Since their backgrounds are not students interested in English, many students struggle to learn English. One way to facilitate their learning is using machine translation available for free on the internet or a smartphone application. In this era, most students have smartphones connected to the

internet and can access online machine translation anytime and anywhere.

2.1.1 Scholars' Perspectives on Google Translate's Quality

Google Translate (GT) is one of the many Google products that enables users to translate words and texts from one language to another. It has become popular and successful due to the large volume of users translating words or texts from other languages to English (Ducar & Schocket, 2018). With advanced technology, most people own computers, have adequate internet access (Bin-Hady, Al-Kadi, Alzubi, & Mahdi 2020), and opt for online translation over human translation (Murtisari Widiningrum, Branata, & Susanto, 2019). Earlier, EFL learners relied on the manual dictionary, which was difficult and time-consuming for many. GT is a reliable free tool that can translate words between English and over a hundred languages (Alhaisoni & Alhaysony, 2017; Latief, Saleh, & Pammu, 2020).

Because of the extensive use of GT, its quality problems have caught the attention of various researchers and have been examined. The findings have yielded mixed conclusions. Specifically, some studies indicated that the quality of translations was relatively low and not suitable for publication, suggesting it should not be utilized in language learning, while others highlighted the benefits of using GT for completing assignments or tasks.

Sheppard (2011) carried out a study to investigate the reasons for the use of GT and to contrast it with professional language services. The researcher observed that GT has become a commonly used tool today and argued that GT offers several advantages: 1) it requires less time for translation compared to searching for vocabulary words in a dictionary, 2) it is less expensive than employing professional translators, and 3) it can assist users in comprehending other languages. Nevertheless, despite its enhanced results, he suggested that relying on GT poses certain risks. This aligns with the conclusions of Garcia and Pena's study (2011), which found that language learners utilized MT, specifically GT, as a resource in their language acquisition. MT could facilitate communication and writing for beginner learners with reduced effort.

However, even though learners were able to write more in a target language using MT, they also tended to become less diligent.

The research conducted by Rensburg, Snyman, & Lotz (2012) examined the quality of Google Translate (GT) in translating texts both from English to Afrikaans and from Afrikaans to English. In this process, the researchers analyzed translations from six distinct text types, which included articles, class notes, meeting minutes, an official letter, an examination paper, and Microsoft PowerPoint slides. These various text types were translated by three different sources: 1) Google Translate, 2) a translation student, and 3) a professional translator. The study revealed that GT-produced translations received a score of 33.8 out of 100, translation students scored 72.2 out of 100, while the professional translator's works earned a score of 96.6 out of 100. The researchers also noted that the products generated by GT would necessitate the greatest amount of user revision. Revisions are essential if users intend to utilize GT outputs as official documents or for publication purposes.

Similarly, Precup-Stiegelbauer (2013) discovered that raw GT outputs were unsuitable for academic applications. The researcher performed a study to investigate how machine translation could potentially pose challenges for language learners, general users, and business users in Romania. The findings indicated that GT could lead to issues since a computer cannot comprehend the functions of words. Consequently, the outputs generated by GT should not be fully trusted and would require human input to be useful. Therefore, the translated results should be avoided for academic use or language learning.

While many past research outcomes appeared predominantly negative, Bahri & Mahadi (2016) identified that GT could serve as a supplementary resource. In their study, the researchers focused on a case involving international students' utilization of GT as an additional tool, with the study taking place at Universiti Sains Malaysia. In this case, 16 international students from diverse fields and backgrounds participated in the LKM 100 Bahasa Malaysia course and were asked to fill out questionnaires. The outcomes indicated that the majority of participants regarded GT as an effective

supplementary tool for vocabulary acquisition, writing, and reading. Furthermore, the use of GT in classroom tasks and assignments motivated the students to engage in independent learning. These studies illuminate the quality of GT outputs, suggesting that scholars should explore how and why language learners integrate GT into their language education.

2.1.2 Students' Attitudes toward GT and their Behavior of GT Use in Thailand

Over the last ten years, numerous researchers have focused on students' perceptions of GT, its effectiveness, and their practices surrounding the use of GT. This increased interest is mainly due to GT's widespread application in education. In their study, Kate-Phan & Sripetpun (2016) examined Thai English major students' attitudes, behaviors, and challenges. The participants consisted of 123 students in their second and fourth years. To collect data, the researchers utilized a questionnaire. The findings indicated that all participants primarily used GT to understand the meanings of words rather than translating sentences or entire paragraphs. However, three significant issues were identified, along with suggested solutions. First, challenges arose in translating passages at the paragraph level, prompting students to break the text into shorter sentences before using GT. Other strategies to address these challenges included using an online dictionary, opting for a different machine translation tool, discontinuing the use of GT, and seeking assistance from others. The second issue concerns cultural differences, grammatical issues, and language structures. Participants tackled these problems by searching for information through Google and reorganizing the raw outputs provided by GT. The third concern involved vocabulary. This indicated that GT often translated texts literally or inaccurately and sometimes omitted parts of the original input. Consequently, participants resolved these issues by reviewing, modifying, or adding elements to the output.

Regarding students' usage of GT for writing in English, Chompurach (2021) discovered that every student in the study employed GT when writing in English. The findings supported earlier research (Alhaisoni & Alhaysony, 2017). Furthermore, over

half of the students utilized GT to understand the meanings of words when completing English writing tasks, aligning with the results of prior studies (Alhaisoni & Alhaysony, 2017; Bahri & Mahadi, 2016; Chandra & Yuyun, 2018; Kate-Phan & Sripetpun, 2016). Additionally, students engaged GT with four categories of words: 1) technical terms, 2) challenging or advanced vocabulary, 3) unfamiliar words, and 4) general words. In analyzing writing assignments at both the sentence and paragraph levels, it was observed that students also relied on GT to translate words, phrases, clauses, predicates, and sentences, as demonstrated in Table 2.1.

Table 2.1 Types of Writing Inputs Rendered with GT by Thai EFL University Students

Writing Task	Writing Inputs Rendered with GT	Examples
Sentence Level	Noun	band
	Gerund	giving
	Verb	help
	Adjective	gentle, political, bright, rich
	Conjunction	because
	Phrase	a hardworking woman
	Clause	[...] everyone can be a hero
	Sentence	My hero can help me when I am in trouble. My hero must not be selfish.
	Predicate	taught me to read English

Note. The examples were from students' assignments without error correction.

Source: Chompurach, 2021

Rensburg Snyman, and Lotz (2012) examined the fact that EFL students often utilized GT when learning English, particularly in writing tasks. The researchers believed that GT could provide translations that were superior to what the learners could produce on their own. Consequently, GT turned out to be a valuable resource for language learners. Furthermore, the studies indicated that students found certain raw GT translations to be unreliable, especially when dealing with longer sentences and

paragraphs. As a result, improving the quality of GT outputs has become a topic of consideration. Some scholars have suggested that one approach to address this issue is through post-editing.

2.2 POST-EDITING OF MACHINE TRANSLATION OUTPUTS

According to earlier studies, the raw results of machine translation, particularly from Google Translate, were lacking in quality at both sentence and paragraph levels. An effective method for enhancing this quality is post-editing. Post-editing involves human translators correcting mistakes found in machine-translated content (Senez, 1998). Regarding categories of post-editing levels, various researchers (Densmer, 2014; Hu & Cadwell, 2016; Taus, 2016) have classified the levels of post-editing into two categories: Light PE and Full PE, providing definitions for each.

2.2.1 Level of Post-Editing

Light post-editing is characterized by minimal PE or rapid PE. In this approach, a machine translation user focuses on enhancing the MT output so it is clear, understandable, and meaningful. This involves addressing lexical and syntactical errors. Corrections include fixing spelling and grammar mistakes, rephrasing unclear sentences, removing redundant words, and correcting mistakes made by MT.

Full post-editing is the process where post-editors adjust MT output to match the quality of human translation. The quality achieved should be on par with that of human translators (Densmer, 2014; Taus, 2016). At this stage, the post-editor must perform all the steps of light PE along with additional detailed tasks, such as rectifying less obvious errors, ensuring consistent and suitable styles, editing content that may be offensive or inappropriate, and correcting formatting issues.

Hu and Cadwell (2016) noted that this category is the most widely used. This PE level has been frequently employed in academic settings and utilized by online

translation platforms like EuroTranslate.rs, LGOTranslations.com, MantanMT.com, and others.

As illustrated in Figure 2.1, the listed websites provide their users with two PE choices: “light PE” and “full PE.” The diagram shows the specific areas that light PE and full PE address and indicates how closely the edited raw translation will approximate human quality after the PE process.

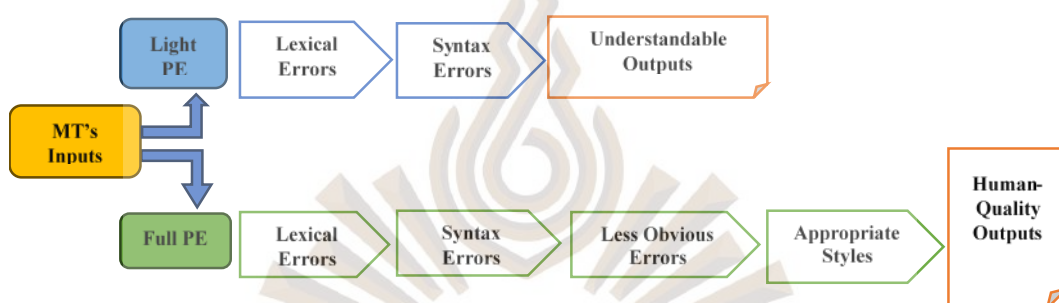


Figure 2.1 Levels of Post-Editing

Source: Densmer, 2014; Hu & Cadwell, 2016; Taus, 2016

As noted previously, post-editing (PE) can significantly improve the quality of machine-generated translations (GT), ensuring that they are clear and communicate the intended messages effectively. The data analyzed shows that a majority of students applied light PE after utilizing GT for their writing in English. According to the studies by Densmer (2014), Hu & Cadwell (2016), and Taus (2016), this light PE was generally conducted at the level of individual sentences.

Table 2.2 Thai EFL Students' PE Behavior and their PE level

Writing Task Types	PE Levels	Students' PE Behavior
Sentence Level	Light PE	“For those <u>redundant words</u> , I would delete them.”
	Light PE	“To post edit, I correct <u>the grammatical errors</u> I have learned.”

Table 2.2 Thai EFL Students' PE Behavior and their PE level (Cont.)

Writing Task Types	PE Levels	Students' PE Behavior
	Light PE	"I edit the outputs by myself. Google Search helps me a lot. I could use (the searched results) in <u>reordering sentences.</u> "
Sentence Level	Light PE	"First, I checked the subject of the sentence. Is it what I expected? Then I check the sentence's <u>grammar</u> , like <u>tenses</u> , <u>adjectives</u> , and <u>adverbs.</u> "

Source: Chompurach, 2021

2.2.2 EFL Students' Levels of PE and Patterns of GT Use with Other Tools

Vinall, Wen, and Hellmich (2023) investigated L2 writers' uses of Machine Translation and other online tools. The target participants post-edited the raw outputs in light and full PE levels. Once they acquired outputs from Google Translate, their next actions, to accept the output, reject it, or employ additional actions, depending on two primary reviews: (1) satisfaction or dissatisfaction with the output and (2) the perceived familiarity of the output. The subsequent action, in which the L2 writers obtained Google Translate outputs and modified them with another online tool, is called "Recheck". The participants attempted to verify the accuracy using online tools to check the L2 output from the first tool. Nouns, verbs, phrases, and sentences were rechecked because they doubted the validity of Google Translate, their writing ability, and their dissatisfaction with the Google Translate output.

Table 2.3 Examples of Recheck Behavior

Participants	First Search			Second Search		
	Tool	Input	Output	Tool	Input	Output
Eliza	GT	Eiffel Tower	Tour Eiffel	Google Search Engine	Tour de Eiffel	Eiffel Tower Wikipedia entry

Table 2.3 Examples of Recheck Behavior (Cont.)

Participants	First Search			Second Search		
	Tool	Input	Output	Tool	Input	Output
Harry	GT	Old	旧	Textbook	Does not find what he is looking for	Resorts to GT Output

Source: Vinall et al., 2023

Some participants did not think Google Translate rendered the input correctly, so they wanted to see whether other online resources encouraged translation more than the first tool; likewise, Chung (2020) conducted an experimental task where Korean university students post-edited the Google Translate outputs of movie reviews in Korean by using Papago, another widely used Machine Translation in Korea provided by Naver Corporation to combine all the mistranslations and errors from the two translated versions (Google and Papago) and created another version of the exact text. The participants were asked to detect errors and post-edit the combined MT text for 30 minutes. The findings are concrete that L2 proficiency significantly affects how language learners post-edit MT output. The Korean EFL students with high L2 proficiency scores had significantly more detecting errors and corrections than lower proficiency students.

In Thailand, utilizing Google Translate output with post-editing appears to be suitable for aiding students in recognizing the linguistic distinctions and similarities between their first language (L1) and second language (L2). Chompurach (2021) noted that the patterns in which students used Google Translate for composing English sentences were examined in six distinct ways regarding Thai EFL university students' use of GT and subsequent post-editing, as depicted in Figure 2.2. The findings revealed six distinct patterns from the students when employing GT and modifying the raw outputs in their English writing. In their post-editing behavior associated with Pattern 6, the students reviewed and refined the Google Translate outputs using various tools.

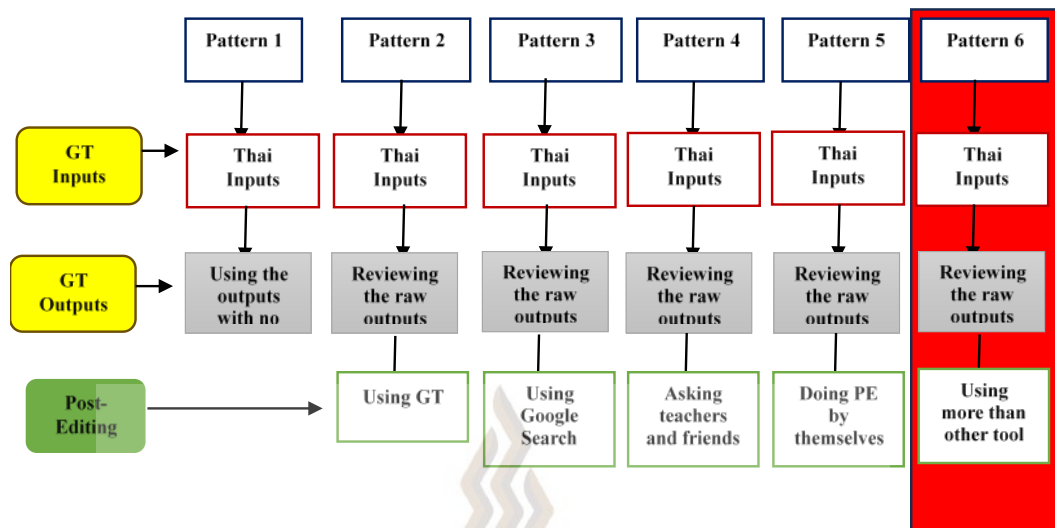


Figure 2.2 Six Patterns of Thai EFL University Students' Post-Editing
GT Outputs in English Writing
Source: Chompurach, 2021

2.3 GRAMMARLY IN ELT CONTEXT

2.3.1 Grammarly's Features used for EFL Writing

As an artificial intelligence (AI), Grammarly is an easy-to-use grammar editing and proofing application (Fitria et al., 2021). Grammarly is among the best English grammar-checking tools in its related innovation field. Bailey & Lee (2020) show that Grammarly can be applied to check localized surface-level language errors (e.g., articles, prepositions, nouns, and verb-noun agreements). Grammarly will check or detect what is being typed from various aspects of writing, from detecting grammatical errors, spelling, sentence construction, and plagiarism to detecting and correcting preposition errors, irregular verb conjugations, inappropriate use of nouns, and correcting wrong words.

Utilization of Grammarly as an automatic writing evaluation tool (AWE) has become increasingly common in various academic environments, especially in the context of higher education, given the demand to write original content as a condition

for graduating from college (Arisandi & Sudarajat, 2023). Grammarly software is helpful for teachers and students when it comes to correcting EFL writing (Ambarwati, 2021). Grammarly can not only identify punctuation marks (such as missing spaces after periods) and spelling errors, including proper nouns, and provide several possible alternatives for misspelled words, but also identify fragments and offer suggestions about verb forms and how to present them (Benalileche, 2021).

Also, Grammarly provides excellent content to help students improve their writing skills. It can increase students' motivation, self-confidence, and involvement in learning, especially writing. This tool will help them develop independence so they are not afraid to write even if they make mistakes. As a result, students need to be bold in writing because they can recognize and correct their writing mistakes using the Grammarly tool (Jayavalan & Razali, 2018). Grammarly also assists students in meeting their academic goals and improving their academic writing skills. Japos (2013) studied undergraduate research students and found that Grammarly improved their written accuracy. In a study by Reis & Huijser (2016), students preferred Grammarly over the Marking Mate alternative feedback system. Based on Cavaleri & Dianati (2016), students' perceptions of Grammarly in an Australian higher education setting yielded positive results, with students stating that Grammarly was helpful and easy to use. They also claim that it improves their writing and is of great help in the development of their understanding of grammar rules. In short, Grammarly is an automated internet software with many features to help students minimize writing errors and provide corrections and explanations.

Even though it has limited features, the free version of Grammarly is still considered helpful for users, especially for writers who only want to correct common or basic errors often detected in their writing. This version provides the essential elements needed, especially in correctness features such as spell-checking, grammar, and punctuation (Dewi, 2023). In addition, this free edition effectively identifies minor grammatical errors such as improper use of commas and misplaced articles. The free edition of Grammarly allows students to check the grammar of up to 500 words. The program automatically identifies typos, highlights them in red, and provides the

necessary corrections when they occur. Users can still set goals in this version, such as domains and audiences. Cavaleri & Dianati (2016) state that the free version of Grammarly detects minor comma errors and article abuse. Here are some features that can be accessed by the free version of Grammarly (Fitria et al., 2021).

Grammar Checker: Grammarly uses artificial intelligence algorithms to analyze text and show grammatical errors, including subject-predicate errors, auxiliary words, and tenses. It helps improve clarity and language errors in writing.

Spell Correction: Grammarly will highlight spelling errors in the text and offer suggestions for misspelled words. This issue is the most popular type of correction because it is the most common error in which users often make typos, and this feature helps them change it into the right words.

Punctuation: Grammarly can also correct misplaced punctuation marks such as periods, commas, and question marks so that the sentences written are easier to read and precise.

Writing Style: Grammarly can suggest improving writing style by paying attention to repeated words and phrases, sentence length, and clarity.

On the other hand, the premium version of Grammarly can achieve much more than the free version, which only offers essential writing components. At least eight features are included in the premium edition, including correctness, clarity, engagement, style, presentation, plagiarism detection, setting goals based on domain, formality, audience, and intent, and there is an overall score of the writing results (Ummah & Bisriyah, 2022). The free version's document fix limit is 500 words; the premium version allows users to edit full text. Existing features will continue to be updated following current technological developments. Based on Ismawati, Akib, & Muhsin, (2021), there are five main features of Grammarly: correctness, clarity, engagement, delivery, and style guide

Table 2.4 Grammarly's Premium Features

No.	Features	Sub-Features	Functions
1	Correctness	Spelling	To detect mistakes or incorrect translation
		Grammar	To improve sentence structure and grammar
		Punctuation	To add the appropriate punctuation or to delete any unnecessary punctuation
2	Clarity	Wordy sentence	To prevent misunderstandings, simplify sentences
		Conciseness	To check to see if the sentences are short and do not utilize unneeded or repetitive terms
		Passive voice	To check for improper passive voice usage
3	Engagement	Vocabulary	To suggest synonyms for words that better fit the sentence.
		Variety	To offer alternate word options that the readers will find simple to understand and relate to one another
4	Delivery	Tone	To set writing's tone and deliver right in expressing confidence, politeness, and formality level in writing.
5	Style Guide	Writing Style	To maintain a consistent style

Source: Ismawati et al., 2021

2.3.2 Advantages and Disadvantages of Grammarly in ELT Context

Advantages of Grammarly

According to Nova (2018), Grammarly has several benefits, which are the strengths of this program in evaluating academic writing. These include helpful feedback for learning, easy access, high evaluation speed, and free services.

Useful Feedback

Grammarly provides valuable feedback that helps them learn better, especially when learning grammar (O'Neill & Russell, 2019). From the clear feedback this automatic writing evaluation program provides, students can realize the mistakes made. They can self-revise and learn not to make the same mistakes in the following essay they write. On the other hand, Grammarly, in evaluating academic writing, gives users a valuable learning experience, especially in enriching English grammar, because there are many choices of words that are presented and can be chosen by students.

Ease of Access

The simple procedures for creating an account, detecting posts with different colored flags, and evaluating posts are primary concerns in their ease of access. In the study by Nova (2018), the user compared the system used in Grammarly with other automatic writing evaluation program systems and admitted that this program has the most accessible access. Because it can be integrated into various applications and platforms, such as Microsoft Word, Outlook, Chrome, and many more; moreover, its users can access it through their mobile phones so that students can access this application easily at any time (Barrot, 2022).

High Evaluation Speed

Students feel this benefit because the examination process is speedy and automatic. Users only need to write, and the Grammarly feature will immediately detect issues or errors that are written quickly, whereas correcting manually will take longer to read back the evaluation results. A similar answer is the positive impact on speed. However, it should be underlined that the speed depends on the availability of connectivity to the internet. A high evaluation speed can save students time evaluating their academic writing and help them revise it in a shorter time.

Complete Features

Grammarly provides comprehensive feedback, especially on the premium version. The premium version of Grammarly offers more than 150 grammar points, plagiarism detection, vocabulary suggestions, contextual spelling, and a brief and comprehensive explanation of every grammatical error (Fitria, 2022). Grammarly presents errors ranging from correctness, such as spelling, grammar, and punctuation; clarity, such as conciseness and passive voice; engagement, such as variations and word choices; and delivery, such as tone and voice.

Disadvantages of Grammarly

Misleading Feedback

Although Grammarly feedback is seen as a valuable correction for writing improvement, from the results of previous studies, some misleading feedback has also been experienced by users. The inaccuracy of the results of this evaluation reveals a small quantity of user dissatisfaction with the evaluation process and their lack of confidence in the evaluation given. In the research by Nova (2018), students said the corrections confused them in writing because the feedback differed from the initial idea. Some feedback was needed to match the students' intentions and even change the meaning and emphasis they wanted from the sentences they had written.

Over-Checking the Reference List

Another unexpected result was the excessive checking of reference lists. The Grammarly program also detects reference errors that can change from the article. With the underscore given by this program in the writing reference list, an error is detected when making the name or title of the article written in the reference list. Users often ignore these suggestions because the Mendeley Referencing System or the existing writing style does not support them.

Non-Contextual Feedback

One area that could improve automatic writing evaluation is the lack of ability to assess the context and substance of the writing. Grammarly is seen as inadequate in linking ideas across sentences and paragraphs effectively. As stated by Faisal & Carabella (2023), Grammarly provides feedback that appears constructive and evaluative, encompassing both micro (i.e., linguistic features) and macro (i.e., content and its creation and development) dimensions; however, this feedback does not always take into consideration the pertinent context that could alter the intended meaning students wish to express.

2.3.3 Students' Perceived Knowledge of Grammarly in Academic Writing

Given the various advantages of the Grammarly application, researchers have examined English students' views on its use in different academic writing tasks, including assignments, stages of the writing process, and university thesis writing. In her investigation of Grammarly's role in essay assignments, Hakiki (2021) concluded that students held a positive perception of Grammarly due to its feedback relevance, practicality, and accuracy in grammar. Likewise, Armanda, Nugraheni, Wulansari, & Imron (2022) found that students recognized the positive effects of Grammarly as both a grammar checker and an advisor on style matters, contributing to an enhancement of their writing skills.

Numerous studies have focused on students' perspectives regarding Grammarly throughout all phases of writing. In particular, Dewi (2023) highlighted that students found Grammarly beneficial during the editing stage, as it could identify errors, propose corrections, and suggest alternative word choices. However, some participants mentioned concerns about the premium version's affordability. In addition, Miranty, Widiati, Cahyono, & Sharif (2021) looked into how Grammarly supported students during the drafting and revising stages. Their results indicated that many students viewed Grammarly as an essential tool for direct corrections, feedback, error detection, and suggestions for grammar and sentence structure issues. Nonetheless, some students

felt that the feedback provided was not consistently relevant, helpful, clear, or applicable to their specific writing contexts (Faisal & Carabella, 2023). Participant responses revealed a combination of positive and negative opinions. A positive perception indicates that students are in favor of using Grammarly as a grammar checker, while a negative perception suggests skepticism about its effectiveness in this role.

Related research indicates that Grammarly offers valuable features for academic writing users. These features help students learn from their mistakes while significantly boosting their confidence and motivation in writing (Pratama, 2020).

Wang, Zhang, Moss, Bonem, & Levesque-Bristol, (2020) state that perceived knowledge includes all personal behavior and beliefs about oneself. It is also influenced by how other people react to them. Thus, it will then affect a person's attitude, as well as attitudes and choices taken by individuals in using something, producing positive and negative knowledge based on one's knowledge and experience in understanding something. Further attention is needed to the pros and cons of implementing artificial intelligence tools, such as Grammarly, in writing classes (Kim, N. J., & Kim, M. K., 2022).

Therefore, Rejeki (2023) investigated the use of Grammarly applications in English Foreign Language (EFL), particularly in academic writing. One way to understand the impact of AI on language teaching and learning is to look at it in terms of students' perceived knowledge. In the latest curriculum, students play an active role in learning centers, so they have an essential position in utilizing the Grammarly application in writing classes.

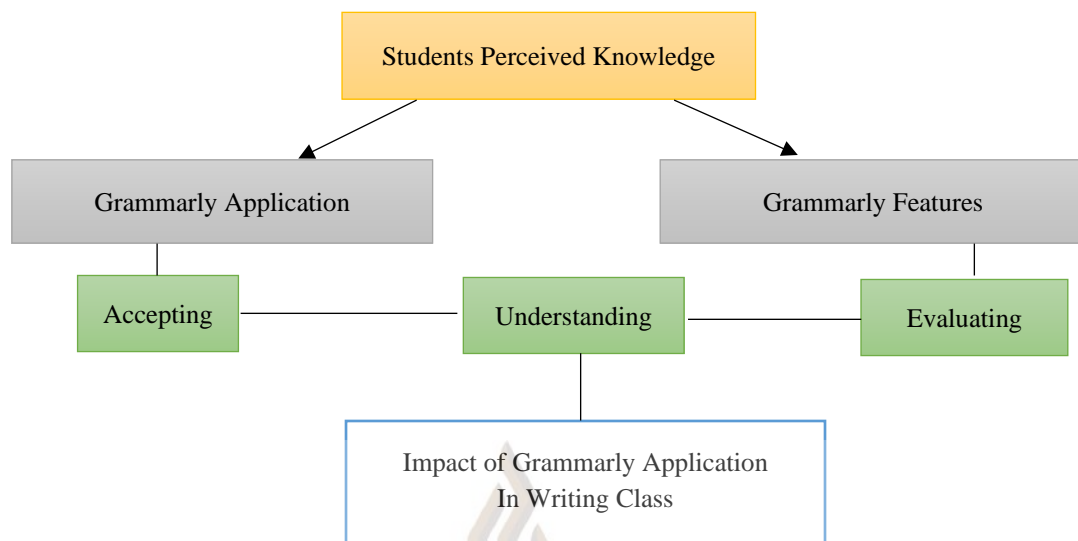


Figure 2.3 Impact of Grammarly in EFL Writing Class

Source: Rejeki, 2023

Rejeki (2023) conducted the conceptual framework related to students' perceived knowledge of Grammarly and its existing features to help students in academic writing by examining how students accept, understand, and evaluate the use of Grammarly, especially the premium version in writing class. The study also looks at the impact students perceive in a writing class. In this class, students have already received many assignments related to academic writing, so they are required to use artificial intelligence tools such as Grammarly to help them improve their writing.

2.4 ENGLISH WRITING ABILITY

Skills refer to a person's proficiency in a specific area and are employed to accomplish tasks accurately. Kim, Y., & Kim, J. (2005) mention, "Skills are the capability to finish tasks." Ibnian (2011) describes writing as "Bringing forth thoughts or emotions (such as composing, creating letters) through written form." Through writing activities, an individual can express their ideas or convey their feelings. Consequently, writing serves as a medium for sharing thoughts or emotions. Azhar et al. (2021) further state, "Writing is an individual's skill in expressing ideas, feelings, and thoughts to others or parties utilizing written communication." From these

viewpoints, it can be inferred that writing skills consist of a person's capability to communicate ideas, feelings, and thoughts to others in written form.

According to Hakim, Rasyid, & Rafli (2020), writing is referred to as composing, which encompasses a series of actions by an individual to communicate ideas and convey them through written language for the audience to comprehend. In today's world, it is evident that writing skills are essential. Writing serves to document or log information, persuade, report, inform, and impact others. Achieving these goals effectively requires individuals who can organize their thoughts and express them clearly; this clarity hinges on well-defined thoughts, coherent organization, and precise word usage.

Writing is often regarded as the most challenging skill for learners of a second language to acquire. At an advanced stage, writing entails more than just a linguistic framework; it also tests our cognitive memory and reasoning abilities (Kellogg, 2008). Thus, the English literacy of EFL students in Thailand, particularly regarding their writing skills, comes into focus. In such scenarios, students should be encouraged to view themselves as speakers and writers of English (McConochie, 2000, p.17). Therefore, proficiency in English writing is crucial for both academic achievement and career advancement (Yong, 2010).

Additionally, various research studies on second language writing have suggested multiple teaching strategies for writing instruction, such as providing feedback to motivate students in second language writing (Hyland & Hyland, 2006; Kuntariati & Lailiyah, 2016), which emphasizes process-oriented writing. Furthermore, implementing a self-regulated approach that enhances students' confidence in writing by tailoring to their needs and characteristics has proven to be an effective method for intermediate learners (Liberty & Conderman, 2018). Moreover, with technological advancements, educators can utilize Internet-based methods for teaching writing (Cahyono & Mutiaraningrum, 2015) or incorporate social media (Sabaruddin, 2019) into their second language writing instruction. It goes without saying that support from teachers is crucial in enhancing students' writing capabilities.

2.5 TRANSLATION ERRORS PRODUCED BY GOOGLE TRANSLATE

There are no established models for classifying translation mistakes. Translation errors arise from various factors, including misunderstandings or incorrect word usage, which have led to numerous error classifications in academic research (Hatim, 2001). Pojprasat (2007) examined translations between English and Thai and classified the errors into semantic and syntactic categories.

The initial viewpoint concerning translation errors focuses on the structure of language or syntax. Every language possesses its own syntax, and this distinctiveness necessitates that translators have a deep understanding of how to interpret the source material to minimize errors. Baker (1992) noted that variations in form are the most frequent issue encountered in translation. These form variations can be divided into six categories: number, gender, person, tense and aspect, voice, and word order. When it comes to numbers, the distinction between singular and plural is crucial in English but not in Thai. The English language employs specific plural morphemes like books, children, and men. In contrast, Thai lacks these morphemes to express the quantity of nouns. If Thai students are unaware of this syntactic distinction, they tend not to include those morphemes in English plural nouns. As for tense and aspect, Thai students face challenges. This difficulty arises because English clearly defines present, past, and future tenses along with their interconnections. In comparison, Thai generally discusses these tenses without much relational structure and lacks explicit patterns. Consequently, it is common for Thai students to make errors when applying tense in translation.

Semantics focuses on words and their meanings. The influence of culture shapes words, leading to nuanced meanings. Thai students often struggle to select an appropriate word for translation tasks due to their limited exposure to English culture and understanding of semantics at their level. Baker (1992) identified five causes for semantic challenges in translation. The first cause is that concepts in the source language may lack a direct equivalent in the target language, requiring Thai to utilize paraphrasing when no corresponding word exists. The second cause relates to the semantic complexity of the word in the source language. The third cause is the absence of either

a broader category or a more precise term in the target language. There might be a scarcity of general terms for specific lexicons from the source language or, conversely, a lack of specific terms for broader words. The fourth cause concerns differences in expressive meaning that are tied to cultural perspectives on particular words. Lastly, incorporating loanwords from the source text can complicate translation, as these words are already integrated into the grammar, meaning, and prestige of the borrowing language. This integration is influenced by cultural factors and often goes unnoticed by learners of the second language. In summary, semantic difficulties arise from cultural differences, rendering some words lexicalized in one language but not in another, or overly complex to translate. When it comes to technical terms, students must possess sufficient knowledge in the relevant field. Additionally, the shifting meaning of loanwords also presents challenges for Thai students. Incorrect word choice is a common error among students who may not grasp its specific usage or the appropriate context for a word.

Concerning translation errors in Google Translate, research on the quality of this machine translation is limited. Among the few studies available, the majority focus on translations from English to other languages. Only the works of Groves & Mundt (2015) and Balk, Chung, Chen, Chang, & Trikalinos (2013) have examined the quality of academic text translations using GT from other languages into English. Groves & Mundt explored translation quality by analyzing five academic texts authored by university students in Malaysian and Chinese, which were then translated into English. They discovered that GT yielded better translation quality for Malaysian input than for Chinese. Balk et al. (2013) assessed GT's quality in translating medical texts from five diverse languages, including Spanish, French, German, Japanese, and Chinese. They found that GT was capable of producing plausible English translations with sufficient accuracy for data extraction in medical research articles. However, the accuracy of translations for European languages (i.e., Spanish, French, and German) was significantly higher compared to translations for Asian languages (i.e., Japanese and Chinese).

Most prior research has focused exclusively on the earlier version of Google Translate (e.g., phrasal-based translations in various target languages); none have evaluated the quality of the newly updated Google Neural Machine Translation System that was released in September 2016. Specifically, only Tongpoon-Panatasorn & Griffith (2020) investigated the quality of Thai-English translations by the updated Google Translate using research abstracts in the Humanities and Social Sciences as sample texts. The objective of the study was to analyze the quality of Google Translate by assessing two different criteria: comprehensibility and usability, as well as to identify types of errors present. The findings indicated that while Google Translate can be a useful resource for Thai EFL students, its translations from Thai to English are only moderately precise and require human editing. The overall comprehensibility rating for Google Translate translations was 3.21 (SD = 0.76) on a scale of 5, suggesting that while the translations are somewhat understandable, many contain vague references. Similarly, the mean usability rating was 2.98 (SD = 0.88), implying that, although certain parts of the text were syntactically correct, many components were ineffective. The most frequent errors involved problems with capitalization (20.58%), punctuation (19.96%), and sentence fragmentation (16.27%), highlighting Google Translate's difficulties with Thai sentence structures and the limited use of punctuation in the Thai language. Despite these shortcomings, the researcher views Google Translate as an advantageous additional tool for Thai EFL students, allowing them to create initial drafts in English. The students could improve their writing skills with suitable guidance in editing and post-editing techniques, particularly in understanding grammatical structures and enhancing sentence coherence. The study suggests incorporating Google Translate into Thai EFL classrooms with teacher oversight to help students produce more accurate English writing while stressing the importance of human revision.

Table 2.5 15 Types of Translation Errors Encountered in the 54 Academic Abstracts Translated from Thai to English by Google Translate

Error Types	Explanation	Number of instances	Percentage
Capitalization	Either missing or unsuitable capital letters	234	20.58

Table 2.5 15 Types of Translation Errors Encountered in the 54 Academic Abstracts
Translated from Thai to English by Google Translate (Cont.)

Error Types	Explanation	Number of instances	Percentage
Punctuation	Missing or misplaced full stops, commas, semicolons, colons, or quotation marks	227	19.96
Fragment	Incomplete phrases or missing clauses, subjects, verbs, or objects	185	16.27
Unclear	Too many unnecessary words or unclear phrases that convey incomprehensible meaning	91	8.00
Preposition	Missing or misuse of prepositions or prepositional phrases	67	5.89
Wrong Words or Word Choice	Variety of vocabulary used to express a clear meaning	63	5.54
Reference	Isolated word or phrase with no connection to previous or subsequent ideas	49	4.31
Articles	Missing or misuse of definite or indefinite articles, quantifiers, numbers, and possessives	47	4.13
Repetition	Word or phrase repeated with no obvious purpose	42	3.69
Verb Form	Misuse of or unsuitable verb tense, voice, phrase, clause or case	27	2.37

Table 2.5 15 Types of Translation Errors Encountered in the 54 Academic Abstracts Translated from Thai to English by Google Translate (Cont.)

Error Types	Explanation	Number of instances	Percentage
Agreement	Count or non-count noun or plural agreements	24	2.11
Word Form	Incorrect part of speech	23	2.02
Sentence Structure	Missing, incorrect, non-sequential sentence components	22	1.93
Pronoun	Incorrect pronoun; misuse of or missing relative pronoun	21	1.85
Conjunction	Incorrect or missing conjunction	15	1.32
Total		1137	100

Source: Tongpoon-Patanasorn & Griffith, 2020

2.6 TRAINING OF GOOGLE TRANSLATE USE WITH GRAMMARLY

Concerns have been raised regarding the enhancement of academic paper translations from the original language to English. The translations remain inaccurate and less natural as authors relied solely on Google Translate. EFL students found Google Translate's translations to be superior to their own, and it also aided in vocabulary acquisition. This was due to the fact that Google Translate could effectively translate individual words to some extent. However, students indicated that Google Translate struggled with accurately translating entire paragraphs or texts; thus, they often needed to refer to a dictionary or seek confirmation from their teachers or peers. Another negative aspect highlighted by students was that Google Translate diminished their motivation to read and write, impacting their learning habits. They expressed a desire for their teachers to provide training or strategies for efficiently using Google Translate to post-edit its raw outputs with additional tools (Chompurach, 2021).

Hartono et al. (2022) discovered that integrating Google Translate with Grammarly could be beneficial. The researchers created a new translation application that combines Google Translate and Grammarly, referred to as Google Translate with Grammarly Combination (GTG-Com). This GTG-COM application is advantageous for writers looking to translate Indonesian scientific articles into English. It operates online as a platform dedicated solely to the translation of Indonesian text into English. By employing a combined Google Translate engine and proceeding to the Grammarly editing process, it delivers only edited text in English. The GTG-COM application proves to be an efficient tool for translation, as it produces more accurate, acceptable, and effective results in a timely manner.

Thus, the training that integrates Google Translate with the Grammarly post-editing process is particularly beneficial for EFL students. This training involves a session for the experimental group of students on utilizing Google Translate alongside Grammarly. The orientation instructs on the utilization of these two translation tools, aimed at providing a quick and effective solution for translating documents from the original language into English. The objective of this training is to improve the quality of translations by enhancing grammar, syntax, vocabulary, and mechanics (Katsberg, 2012; Hartono et al., 2022; Guba et al., 2024).

Knowles (2022) researched the training of students on using Google Translate following the ADAPT approach within the L2 learning environment. Instructors now need to expand their understanding of Google Translate, establish clear policies that they are comfortable with regarding its use, and educate students on the extent and manner in which they should utilize online resources to support their coursework.

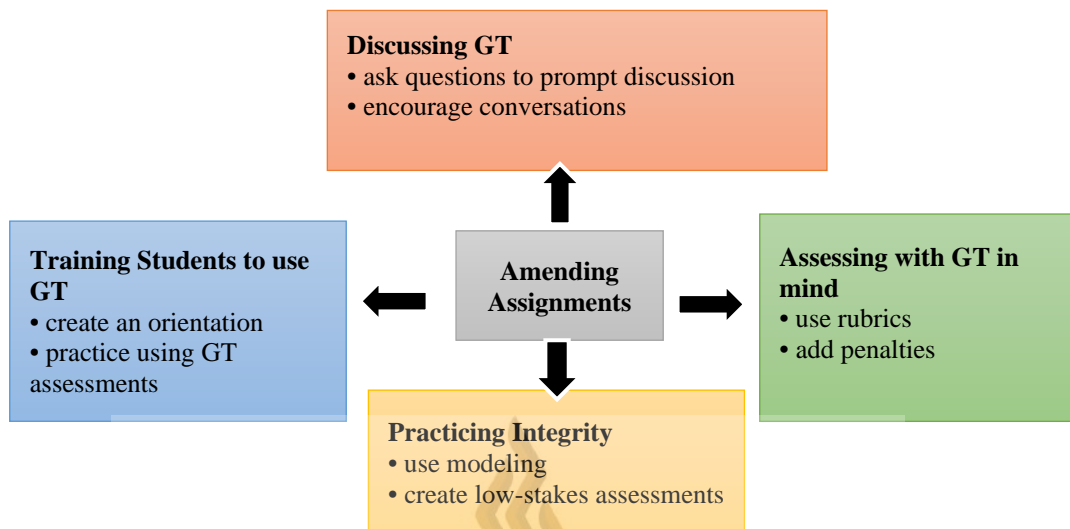


Figure 2.4 ADAPT Approach to GT use in the L2 Classroom

Source: Knowles, 2022

Instructing students on the effective use of online translation tools (GT) can significantly enhance their writing abilities, as shown by O'Neill's research (2016, 2019) on L2 (second language) learners. It is important for students to receive guidance on how to properly and improperly utilize GT. During the orientation phase of online courses, students participate in a GT orientation and complete a corresponding assignment. This assignment covers aspects such as pronunciation, vocabulary, writing, and oral communication skills.

Written Orientation

The final and third activity demonstrates to students what is needed to complete their writing and oral tasks. This exercise increases students' awareness of their ability to accurately recognize grammar concepts. It also highlights the significance of identifying examples and brings attention to the consequences of using improper verb tenses. This activity can uncover shortcomings in students' comprehension of grammar in their first language (L1). Compiling a list of keywords, concepts, and examples can assist students in addressing these gaps. For first-semester students, this activity can be conducted in their native language. For more advanced students, a sample writing assignment from a prerequisite course can be utilized to ensure it is suitable for their

level. Students have the opportunity to revise and resubmit their orientation assignments as many times as they like. The objective is to help students grasp the advantages and limitations of utilizing grammar tools (GT) before they begin their language studies.

Part Three: Escritura and Oral Assignments

To create your escritura (written assignment) and oral you will need to include a number of grammar and vocabulary examples. You must be able to use and identify different parts of speech. For each escritura (and oral) you are given a checklist. The checklist includes vocabulary and grammar you must include and identify as well as Permitted Verb Tenses. You may not use any verb tense other than what is listed as permitted.

Checklist		
Categories	Description	Examples
Vocabulary	(1.1v) Greetings	1 example
	(1.2v) Cardinal numbers	2 examples
	(1.3v) Subjects & Classes	1 example
Grammar	(1.1) Nouns and articles	2 examples
	(1.2) Numbers 0-30	1 example
	(1.3) Present tense of the verb 'to be'	1 example
	(1.4) Telling time	1 example
Permitted Verb Tenses	Present tense Near future (ir + a + infinitive verb)	

Activity 1: To complete this activity, identify all the grammar examples from the checklist within the *italicized text* below. The vocabulary examples have been done for you. Identify each grammar example, by adding the symbols (in parenthesis) after the example.

Note: 2 grammar examples are missing, and 1 verb is conjugated in a tense that is not permitted.

Hello (1.1v). My name is Ana. I am nineteen (1.2v) and a full-time student. I am studying Spanish language and literature (1.3v) at the University of Guadalajara. I like to study in the library. When it is sunny, I sit outside the library underneath the trees. Monday night I studied for my Spanish test for four (1.2v) hours.

Activity 2: Not including all the examples in the checklist will result in penalties. List the two (2) examples from that appear in the checklist, but are missing from the paragraph:

- 1.
- 2.

Activity 3: Including a verb tense that is not listed as a permitted verb tense will result in large penalties. What verb is included in the paragraph that does not appear in the list of permitted verb tenses? What verb tense?

Figure 2.5 Written Assignment Orientation

Source: Knowles, 2022

Regarding training in Grammarly use, Drolet (2023) taught a Field of Study English course; the students had to write a problem-solving essay as part of their final evaluation. Once the students had submitted the first draft of their papers, the instructor met them one by one through Grammarly tutorials with Artificial Intelligence (AI).

Table 2.6 Grammarly Report Check

Report Type	Description	How to Use
Overall Score	Provides a score for the document based on grammar, spelling, punctuation, and style.	Aim for over 70

Table 2.6 Grammarly Report Check (Cont.)

Report Type	Description	How to Use
Goals	Provides personalized writing goals based on the document's context and the writer's intent. Dictates Grammarly's suggestions,	Select what you are writing and who it is for
Correctness	Highlights grammar, spelling, and punctuation errors and proposes fixes. Underlines in red.	Start here to fix critical grammatical errors.
Clarity	Analyzes a piece for clarity and conciseness and provides suggestions for improvement— Underlines issues in blue.	Review and rephrase suggestions as part of the copyediting process.
Engagement	Analyze the document for its level of engagement and readability and provide suggestions for improvement. Underlines in green.	Review to improve word choice. Optional.
Delivery	Analyze the document's tone and language and suggest improvements based on the intended audience and purpose. Underlines in purple.	Use to determine or change how your writing sounds to readers. Optional.
Plagiarism	Scans the document for plagiarism and provides a report on any potential matches	Scan a document to avoid accidental or deliberate plagiarism.

Source: Drolet, 2023

2.7 STUDENTS' OPINIONS TOWARDS THE TRAINING OF GOOGLE TRANSLATE USE WITH GRAMMARLY

When instructors develop training for EFL students on Machine Translation (MT), it's important to consistently discuss Google Translate (GT) throughout the course, from orientation to assessments. This discussion is vital so that students grasp the course expectations, especially since they've likely faced challenges when using GT (Clifford, Merschel, & Munné, 2013; Jolley & Maimone, 2015). Students who have encountered issues may feel hesitant to utilize or inquire about Google Translate.

Regular conversations can assist students in understanding the expectations, advantages, and disadvantages while also encouraging them to feel comfortable seeking clarification.

Even in a classroom that incorporates Machine Translation (MT) and promotes dialogue, students may hesitate to ask the instructor questions. Consistently reaching out to students and checking if they have inquiries can foster a trusting environment between teachers and students.

Knowles (2022) performed a post-course survey to evaluate students' perceptions following the Google Translate training. The vocabulary activity was identified by students as the most valuable. The writing and oral assignments activity ranked as the second most beneficial. The activities regarded as the least helpful were the pronunciation activity and the pronunciation reflection. Training that empowers students to engage with the output may enhance their understanding of the second language (L2).

Table 2.7 Ideas about the Effectiveness of the ADAPT Approach to Train GT

Students' Ideas about the Effectiveness of GT Integration	Examples of Student Responses
Instructors could make the integration of GT more effective	<ul style="list-style-type: none"> - Provide more websites to differentiate different translations, i.e., an online Spanish dictionary. - I think it should be evident whether a translation was used. - Allow it to be used for complicated assignments, and would benefit from using it.
Unsure as to whether the Instructor could make the integration of GT more effective	<ul style="list-style-type: none"> - I am honestly not sure. It is up to the user because not everyone may think it is helpful. - I am not sure.

Table 2.7 Ideas about the Effectiveness of the ADAPT Approach to Train GT (Cont.)

Students' Ideas about the Effectiveness of GT Integration	Examples of Student Responses
Instructors could not make the integration of GT more effective	<ul style="list-style-type: none"> - I think our instructor does a great job. - I think its integration was good. - No, I think this is enough. - I think educating people on the inaccuracies is a very effective way to teach someone not to be too reliant on GT but that it can be beneficial in some ways.

Source: Knowles, 2022

The majority of students expressed that instructors should permit the use of GT (75%). Students seemed to acknowledge that while the tool was helpful, there were drawbacks, such as becoming overly dependent on it. Most students either agreed or strongly agreed when asked if they would suggest this ADAPT approach to fellow students and instructors. It remains unclear whether students would endorse the course due to the ADAPT or the teaching style of the instructor. Conducting a more extensive study involving various instructors applying the ADAPT approach would clarify how these adaptations affect students' usage and perceptions (Knowles, 2022).

Regarding training in Grammarly usage, after the revision process conducted by Drolet (2023), post-revision surveys were distributed to gauge students' experiences with Grammarly training. The instructor gathered 25 responses from 29 students. The feedback was largely positive, though only 44% of the students felt that AI training tools should be more frequently utilized in the classroom. In response to the open-ended question, "What do you like most about Grammarly tutorials?" many students indicated that they appreciated the content related to identifying the types of errors using a color-coded system.



Figure 2.6 Color-Coding Key Document

Source: Drolet, 2023

On the other hand, regarding the question, “What do you like least about Grammarly tutorials?” the students’ responses suggested that AI is inaccurate, so the instructor needed to give more explanations of Grammarly's use. These results generally reveal that the integration of Grammarly positively impacted the students’ revision process.

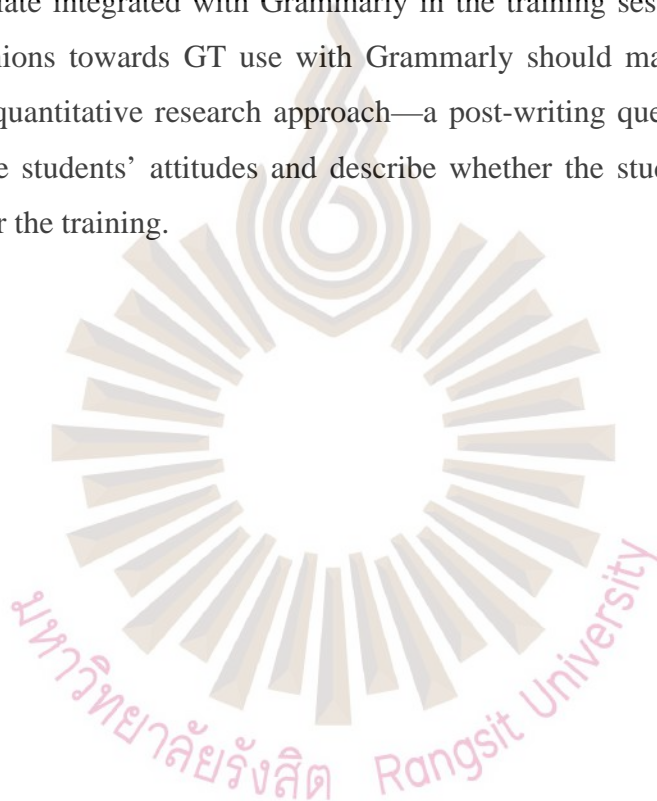
2.8 CHAPTER SUMMARY

Training in using Google Translate with Grammarly can efficiently help EFL students translate academic papers from the source language to English. This post-editing Machine Translation (MT) with Automatic Writing Evaluation (AWE) process enhances EFL students’ writing ability in light post-editing, both at the sentence and paragraph levels.

Teachers instruct EFL students to render the source text from their first language (L1) to English as a second language using Google Translate. When the raw

outputs of GT come out, the students efficiently identify two specific translation errors, syntactic and semantic, which are classified by how many frequencies of errors are in the translation of the source language (L1) to English (L2). After using Google Translate, Grammarly is a supplementary proofreading tool for checking correctness, such as spelling, grammar, punctuation, clarity, engagement, delivery, and style guide.

This study proposes plausible optimization strategies for teaching how to use Google Translate integrated with Grammarly in the training session. Moreover, EFL students' opinions towards GT use with Grammarly should mainly be collected by employing a quantitative research approach—a post-writing questionnaire—to better understand the students' attitudes and describe whether the students' writing ability improved after the training.



CHAPTER 3

RESEARCH METHODOLOGY

This chapter presents the research methods used in this study to explore implementing Google Translate with Grammarly to enhance Thai upper secondary students' English Writing Ability. The research investigates probable causes of translation errors in Thai-to-English writing assignments by using Google Translate, Thai upper secondary students, and how Grammarly proofreads those writing assignments. This chapter includes details about the population and samples, the research design, and the research procedures, which include the data collection and the data analysis

3.1 POPULATION AND SAMPLES

The population of this study is EFL Thai upper secondary school students. The target participants under investigation are the critical focus of this study: 18 upper secondary students who are 16- to 17-year-old, either sex, studying English as a second language in English-Arts major at the Northern Thai government school, who were willing to participate in the research and sign the consent form; who met the requirements of the research and signed the consent form to participate in the study; and who were recruited to attend the training of Google Translate with Grammarly Use. The convenience sampling method was used to choose this group. It was based on whether their 10th-grade English teacher needed exposure to Google Translate and other proofreading tools, such as Grammarly, to check EFL writing assignments, whether they felt confident or reluctant when using Google Translate with Grammarly, and whether their EFL writing assignments were improved. The students' data was collected in the second semester of 2024. The participants were excluded, withdrawn, or terminated from the study if they are minors who were not able to get informed consent from their parents to avoid ethical issues; those who wish to withdraw consent to participate at any

time prior to the study was considered a consent revocation, and if the university institutional review board (IRB) had the authority to suspend or terminate IRB approval of the research that was not being conducted under IRB requirements, or that might pose unexpected, serious harm to the sampled EFL Thai upper secondary students.

3.2 RESEARCH DESIGN

This study was a one-group pretest-posttest design research (Fitz-Gibbon et al., 1987). This crucial choice underpinned the exploration of implementing Google Translate with Grammarly to enhance Thai upper secondary students' English writing ability. The same tests were used as the pre- and post-tests. The test comprised quantitative data: three closed-ended and open-ended questionnaires on the purposes and attitudes in using Google Translate (Sukkhwa, 2014; Chompurach, 2021) and the students' perceptions of using Grammarly (O'Neill & Russell, 2019; Rejeki, 2023), and the online students' Thai-English worksheet with 8 Thai clippings (Pojprasart, 2007; Wongranu, 2017; Tongpoon-Patanasorn & Griffith, 2020; Jamjuree Journal, 2020; Drolet, 2023) before and after the training on the use of Google Translate and Grammarly which was constructed by four instructional period lesson plans: Google Translate use with Grammarly features, introduction to 11 types of translation errors: part 1, introduction to 11 Types of translation errors: part 2, and revision of Google Translate use with Grammarly. After all tests, the researcher obtained further quantitative data from the closed-ended post-training questionnaire (Knowles, 2021). The best method for distributing the questionnaires and the online exercises depended on the target students' preferences. The researcher chose one online survey platform, Google Forms, which was attached to the QR codes, in which the students could complete all questionnaires or provide feedback with their devices, without any measure or pressure.

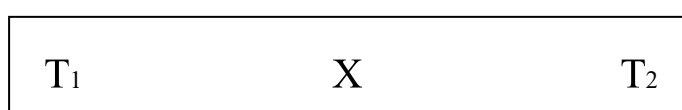


Figure 3.1 Research Design

T1 refers to the pre-test of the use of Google Translate and Grammarly questionnaires, and the online student's Thai-English worksheet with 8 Thai Clippings to elicit the students' pre-writing ability data.

X refers to a treatment, which is the training on the use of Google Translate with Grammarly with teacher-oriented optimization strategies.

T2 refers to the post-test of Google Translate and Grammarly questionnaires, and the online student's Thai-English worksheet with 8 Thai clippings to elicit the students' post-writing ability data. After the training of Google Translate use with Grammarly, the researcher can elicit students' opinions towards the training by the post-course questionnaire.

3.3 RESEARCH PROCEDURES

The research procedures of this study involve five main stages. 1) The preparation stage 2) The research ethical consideration stage 3) The pilot test and students' preparation stage 4) The implementation stage 5) The data analysis stage. The summary of the process is as follows:

Stage one: Preparation

Developing a Conceptual Framework that Leads to Developing a Theoretical Framework for This Study.

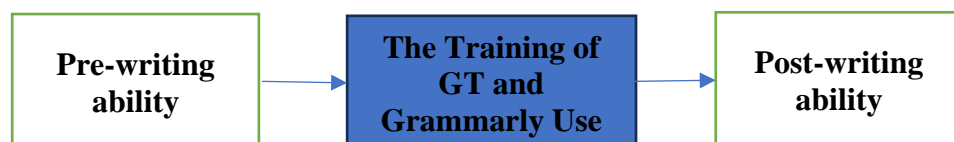


Figure 3.2 Conceptual Framework

Designing Google Translate and Grammarly Questionnaires

Purposes and Attitudes in Using Google Translate Questionnaire A five-point rating scale questionnaire on Purposes and Attitudes in Using Google Translate was adapted from Sukkhwa (2014) and Chompurach (2021) to investigate students' purposes of GT use for English learning, attitudes, benefits and drawbacks, and problems and solutions when using GT. Questionnaire items were created based on literature review and related studies. The questionnaire contained five sections: general information of the participants, purposes of GT use for English learning of GT users, attitudes towards the use of GT, general comments on benefits and drawbacks of GT, and problems and solutions in using GT. General comments about benefits, drawbacks, issues, and solutions to using GT were open-ended questions.

Students' Perceptions of Using Grammarly Questionnaire: A closed-ended questionnaire adapted from O'Neill & Russell (2019) and Rejeki (2023) was the first tool to gauge the students' perceptions of their proficiency with using Grammarly for academic writing. The researcher used a closed-ended questionnaire in the form of a Likert scale. The statement consisted of 5 answer choices: strongly agree, agree, neutral, disagree, and strongly disagree. Students only chose one option based on their views. The questionnaire adapted by O'Neill & Russell (2019) consisted of 3 indicators of students' perceived knowledge of using Grammarly.

Table 3.1 Grammarly Use's Questionnaire Aspects

Aspects	Indicators	No. of Questions
Accepting	Reasons for using Grammarly	5
Understanding	Usage of Grammarly	5
Evaluating	Strengths and Weaknesses of Grammarly	5

Validating the Use of GT and Grammarly Questionnaires. To ensure the quality of the research instrument, the researcher consulted with three experts to establish content validity for both questionnaires. After the experts confirmed the content validity of all questions, the researcher calculated the Index of Item Objective Congruence (IOC)

for each instrument. The resulting IOC scores were 1.00 for the Purposes and Attitudes in Using Google Translate Questionnaire, 1.00 for the Students' Perceptions of Using Grammarly Questionnaire.

Observing and Studying Fundamental Concepts and Teaching Strategies of Writing Ability and Translation Errors Google Translate Produces. Regarding Pojprasat (2007) and Wongranu (2017) errors in the translation model, where Thai EFL students took a session on the topic of translation between Thai and English using machine translation, the errors were categorized into two types: syntactic and semantic. Syntactic errors had the highest frequency, implying that the students usually made grammatical errors when translating. Semantic errors had the second highest frequency. In the meantime, Tongpoon-Patanasorn & Griffith (2020) indicated that 15 types of translation errors were encountered in 54 academic abstracts from Thai to English produced by Google Translate. The researcher combined two instruments in Table 3.2, which shows the results of error types in the form of frequencies found in students' academic abstract translations categorized by syntactic and semantic errors, and the percentage of errors provided. All translation error types were divided by colour-code keys in Grammarly: red, blue, green, and purple. (Drolet, 2023)

Table 3.2 15 Types of Translation Errors Encountered in Academic Abstracts Translated from Thai to English by Google Translate, Categorized by Syntactic or Semantic Errors and Color-Coding Keys in Grammarly

Error Types	Explanation	Number of instances	Percentage
Capitalization (Syntactic)	Either missing or unsuitable capital letters	234	20.58
Punctuation (Syntactic)	Missing or misplaced full stops, commas, semicolons, colons, or quotation marks	227	19.96

Table 3.2 15 Types of Translation Errors Encountered in Academic Abstracts Translated from Thai to English by Google Translate, Categorized by Syntactic or Semantic Errors and Color-Coding Keys in Grammarly (Cont.)

Error Types	Explanation	Number of instances	Percentage
Fragment (Syntactic)	Incomplete phrases or missing clauses, subjects, verbs, or objects	185	16.27
Wordy/Unclear (Semantic)	Too many unnecessary words or unclear phrases that convey incomprehensible meaning	91	8.00
Preposition (Syntactic)	Missing or misuse of prepositions or prepositional phrases	67	5.89
Word Choice (Semantic)	Variety of vocabulary used to express a clear meaning	63	5.54
Reference (Semantic)	Isolated word or phrase with no connection to previous or subsequent ideas	49	4.31
Determiners (Syntactic)	Missing or misuse of definite or indefinite articles, quantifiers, numbers, and possessives	47	4.13
Repetition (Syntactic)	Word or phrase repeated with no obvious purpose	42	3.69
Verb Form (Syntactic)	Misuse of or unsuitable verb tense, voice, phrase, clause or case	27	2.37
Noun Agreement (Syntactic)	Count or non-count noun or plural agreements	24	2.11
Word Form (Syntactic)	Incorrect part of speech	23	2.02

Table 3.2 15 Types of Translation Errors Encountered in Academic Abstracts Translated from Thai to English by Google Translate, Categorized by Syntactic or Semantic Errors and Color-Coding Keys in Grammarly (Cont.)

Error Types	Explanation	Number of instances	Percentage
Sentence Structure (Syntactic)	Missing, incorrect, non-sequential sentence components	22	1.93
Pronoun (Syntactic)	Incorrect pronoun; misuse of or missing relative pronoun	21	1.85
Conjunction (Syntactic)	Incorrect or missing conjunction	15	1.32
Total		1137	100

Color-Coding Keys in Grammarly

Correctness in Red underlined helps you improve spelling, grammar, and punctuation. Examples of Correctness errors are confused words, incorrect noun numbers, wrong or missing prepositions, faulty verb tense, incorrect verb form, comma misuse, faulty subject-verb agreement, misplaced words or phrases, punctuation in compound or complex sentences, misspelled words, misuse of semicolons, quotation marks, etc., determiner use (a/an/the/this/etc.), and pronoun use.

Clarity in Blue underlined makes your writing easier to understand. Clarity errors include unclear sentences, wordy sentences, unclear paragraphs, hard-to-read texts, passive voice misuse, and intricate texts.

Engagement in Green underlined suggests changing words to make your writing more effective and interesting. Examples of Engagement errors are word choice and fluency.

Delivery in Purple underlined helps you use the right language register (academic and formal writing). Delivery errors include inappropriate colloquialisms, tone suggestions, and incomplete sentences.

Designing translation errors tested in Thai-English translation worksheet The fundamental concept of the test is to investigate the participants' translation errors from Thai to English. The researcher developed the test consisting of 8 Thai article clippings in the Jamjuree Journal of Chulalongkorn University adapted to be appropriate for the participants' level (Pojprasat, 2007) and modified to suit the grade 10 to grade 12 EFL students. In the Thai EFL upper secondary students' classroom context, the researcher integrated Thai general knowledge journal articles genre in two areas, i.e., education and technology for students at B1 level of CEFR (Rangapthuk; Office of the Basic Education Commission (OBEC) Ministry of Education, 2014), to translate them into English. Examining the B1 language features, these Thai-English articles were tested in the online graded text editor (OGTE), the free text analysis tool for English as a foreign language community that promotes extensive reading and vocabulary reading. In so doing, the researcher checked the lexical level analysis of the articles, that is to say, the idea that sentence complexity and paragraph length, along with vocabulary density, were identifiable by 80 percent under coverage as possible, as well as by vocabulary thresholds of a text, below 80 percent coverage, reading comprehension is almost possible (Hu & Nation, 2000) and 95 percent coverage is the point at which learners can read without the help of dictionaries. (Laufer, 1989).

While translating Thai clippings into English using Google Translate, only 10 of the 15 error types identified by Tongpoon-Patanasorn & Griffith were detected. These specific error types, including punctuation, wordy/unclear, prepositions, word choice, reference, determiners, verb forms, noun agreement, pronoun, and conjunctions, illuminate the aspects requiring attention in machine translation. This observation compellingly underscores that the artificial intelligence (AI) employed by Google Translate in 2024 has made substantial strides in both syntactic and semantic prowess compared to its capabilities in 2020.

Furthermore, introducing the Adaptive Translation feature in February 2024 marks a significant evolution in user experience. This innovative feature allows the system to process the text needing translation and integrate a rich dataset of up to 30,000 meticulously translated examples. The striking results reveal that Google Adaptive Translation has outperformed its predecessor, achieving a remarkable quality improvement of up to 23% (Weldom & Modi; Google Cloud, 2024). This advancement highlights Google's dedication to refining translation technology and promises users increasingly accurate and nuanced translations, enriching their communication across languages.

Table 3.3 10 Types of Translation Errors, Highlighted in Yellow Rows, Encountered in the 8 Thai Article Clippings from Thai to English by Google Translate, Categorized by Syntactic or Semantic errors, and Color-Coding Keys in Grammarly

Error Types	Explanation	Number of instances	Percentage
Capitalization (Syntactic)	Either missing or unsuitable capital letters	234	20.58
Punctuation (Syntactic)	Missing or misplaced full stops, commas, semicolons, colons, or quotation marks	227	19.96
Fragment (Syntactic)	Incomplete phrases or missing clauses, subjects, verbs, or objects	185	16.27
Wordy/Unclear (Semantic)	Too many unnecessary words or unclear phrases that convey incomprehensible meaning	91	8.00
Preposition (Syntactic)	Missing or misuse of prepositions or prepositional phrases	67	5.89

Table 3.3 10 Types of Translation Errors, Highlighted in Yellow Rows, Encountered in the 8 Thai Article Clippings from Thai to English by Google Translate, Categorized by Syntactic or Semantic errors, and Color-Coding Keys in Grammarly (Cont.)

Error Types	Explanation	Number of instances	Percentage
Word Choice (Semantic)	Variety of vocabulary used to express a clear meaning	63	5.54
Reference (Semantic)	Isolated word or phrase with no connection to previous or subsequent ideas	49	4.31
Determiners (Syntactic)	Missing or misuse of definite or indefinite articles, quantifiers, numbers, and possessives	47	4.13
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Verb Form (Syntactic)	Misuse of or unsuitable verb tense, voice, phrase, clause or case	27	2.37
Noun Agreement (Syntactic)	Count/non-count noun or plural agreements	24	2.11
Word Form (Syntactic)	Incorrect part of speech	23	2.02
Sentence Structure (Syntactic)	Missing, incorrect, non-sequential sentence components	22	1.93
Pronoun (Syntactic)	Incorrect pronoun; misuse of or missing relative pronoun	21	1.85
Conjunction (Syntactic)	Incorrect or missing conjunction	15	1.32
Total		1137	100

Color-Coding Keys in Grammarly

Correctness in Red underlined helps you improve spelling, grammar, and punctuation. Examples of Correctness errors are confused words, incorrect noun numbers, wrong or missing prepositions, faulty verb tense, incorrect verb form, comma misuse, faulty subject-verb agreement, misplaced words or phrases, punctuation in compound or complex sentences, misspelled words, misuse of semicolons, quotation marks, etc., determiner use (a/an/the/this/etc.), and pronoun use.

Clarity in Blue underlined makes your writing easier to understand. Clarity errors include unclear sentences, wordy sentences, unclear paragraphs, hard-to-read texts, passive voice misuse, and intricate texts.

Engagement in Green underlined suggests changing words to make your writing more effective and interesting. Examples of Engagement errors are word choice and fluency.

Delivery in Purple underlined helps you use the right language register (academic and formal writing). Delivery errors include inappropriate colloquialisms, tone suggestions, and incomplete sentences.

The researcher designed the table in Figure 3.3 by summarizing the essence of Table 3.3 together. Therefore, this table can categorize all detected 11 Google Translate translation errors and put those in four highlighted and underlined colors in Grammarly.

Table 3.4 Main Table of Detected Translation Errors from Google Translate and Highlighted & Underlined Colors on Grammarly

Highlighted & Underlined Colors in Grammarly	<u>Red</u>	<u>Blue</u>	<u>Green</u>	<u>Purple</u>
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Table 3.4 Main Table of Detected Translation Errors from Google Translate and Highlighted & Underlined Colors on Grammarly (Cont.)

Detected Translation Errors from Google Translate	<p>Punctuation</p> <p>Preposition</p> <p>Determiners (Article)</p> <p>Verb Form</p> <p>Noun Agreement</p> <p>Pronoun</p> <p>Conjunction</p>	<p>Wordy/Unclear Reference</p>	<p>Word Choice</p>	<p>Polite/Professional</p>
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After finishing the design of the main table of Detected Translation Errors from Google Translate versus highlighted and underlined Colors on Grammarly, the researcher compiled all eight clippings with translated outputs from Google Translate and Grammarly correctness and rephrasing in every round. This is one example of Thai article clippings and the errors tested in Thai-to-English translations by Google Translate version 2024 and proofread by Grammarly. (See Appendix 1, Section C)



Figure 3.3 One Example of Article Clippings
Source: Wittayakorn, 2020

อัครวิเศษ, วิทยากร (2020), 5G กับ การเปลี่ยน Key Players ใน โลก ศูนย์ทดสอบ 5G แห่ง จุฬาลงกรณ์มหาวิทยาลัย, Jamjuree Journal: Vol. 22: Iss. 3, Article 4, Page 3.

ในโลกของอนาคตซึ่งจะทดแทนการทำงานของ 4G ด้วย 5G ตัวเซ็นเซอร์นี้ ควรจะสามารถเคลื่อนไหวได้ง่ายด้วย กรณีนี้ AIS เป็นผู้ตั้งประเด็นขึ้น โดยคณาจารย์ได้ทำหน้าที่วิจัยทดลองเปลี่ยนจาก NB-IoT สำหรับวัดค่า PM 2.5 ที่ติดตั้งตามเสาไปติดที่ CU Pop Bus ทำให้แทนที่เราจะต้อง Deploy ตามจุดต่างๆ ซึ่งต้องใช้นับพันตัว ตัวเซ็นเซอร์นี้จะเคลื่อนที่ไปเรื่อยๆ ในพื้นที่ของมหาวิทยาลัย ตามการเคลื่อนที่ของ รถป๊อปบัส ไอเดียนี้ทำให้เราขยายมุมมอง ให้เห็นภาพในอนาคตที่ว่า หุ่นยนต์ จะเป็น Swarm Robot หรือหุ่นยนต์ธรรมดา จะเคลื่อนไปสู่ Cloud Robot ซึ่งจะต้องมี การสื่อสารระหว่างกัน (Peer-to-Peer Communication) และระหว่างหุ่นยนต์กับ Server ซึ่งจะเห็นได้ว่าเป็นตัวอย่างของ ลักษณะการ Uplink ของ Data ที่จะมีมากยิ่งขึ้นๆ ในอนาคต

Translated Text by Google Translate via Google Lens

In the future world that will replace the operation of 4G with 5G, this sensor should be able to move easily. In this case, AIS raised the issue. The lecturers have done research and experimented to change from NB-IoT for measuring PM 2.5 installed on the pole to be installed at CU Pop Bus. So instead of having to deploy at various points, which requires thousands of units, this sensor will move continuously in the university area, following the movement of the Pop Bus. This idea allows us to expand our perspective to see the future that robots will be Swarm Robots or ordinary robots will move to Cloud Robots, which will require peer-to-peer communication and between robots and servers. It can be seen that this is an example of the Uplink data characteristics that will increase more and more in the future.

Grammatically Correctness and Rephrasing

In the future **world that will replace** the operation of 4G with 5G, this sensor should be able to move **easily**. In this case, AIS raised the issue. The lecturers have done research and experimented **to change** from NB-IoT **for measuring** PM 2.5 installed on the pole to be installed at CU Pop Bus. **So instead** of having to deploy at various points,

which requires thousands of units, this sensor will move continuously in the university area, following the movement of the Pop Bus. This idea allows us to expand our perspective to see the future that robots will be Swarm Robots or ordinary robots will move to Cloud Robots, which will require peer-to-peer communication **and** between robots and servers. It can be seen that this is an example of the Uplink data characteristics that will increase more and more in the future.

Detected Translation Errors in Round #1

Correctness Errors (Red Underlined): Verb Form, Preposition, Punctuation

Clarity Errors (Blue Underlined): None

Engagement Errors (Green Underlined): Word Choice

Delivery Errors (Purple Underlined): None

Final Grammarly Post-Edited Outputs

In the future, when the operation of 4G is replaced with 5G, this sensor should be able to move quickly. In this case, AIS raised the issue. The lecturers have done research and experimented with changing from NB-IoT to measure PM 2.5 installed on the pole to be installed at CU Pop Bus. So, instead of having to deploy at various points, which requires thousands of units, this sensor will move continuously in the university area, following the movement of the Pop Bus. This idea allows us to expand our perspective to see the future that robots will be Swarm Robots or ordinary robots will move to Cloud Robots, which will require peer-to-peer communication between robots and servers. It can be seen that this is an example of the Uplink data characteristics that will increase more and more in the future.

Designing Online Student's Thai-English Translation Worksheet for Pre- and Post-Writing Ability Tests. The researcher constructed the Online Student's Thai-English translation worksheet to assess students student's writing ability data when the target students used this online form to produce translated text using Google Translate outputs, and Grammarly-proofread text outputs, as many uncountable rounds as possible, to finalize their translation texts from Thai article clippings (Jamruee Journal,

2024). (See Appendix 1, Section D) before and after the training of Google Translate with Grammarly use. The procedures for constructing this test are described below:

Name _____ Grade _____

Online Student's Thai-English Translation Worksheet

Instructions: Complete this form with 8 assigned clippings by correctly following the instructions attached to each item. When encountering errors in translation in Google Translate text, indicate which type of translation error is based on the table below, along with **red**, **blue**, **green**, and **purple** highlights, bolds, and underlines as determined by Grammarly—correct translation errors in the Grammarly outputs as many rounds as needed until there is none.

Highlighted & Underlined Colors in Grammarly	Red	Blue	Green	Purple
Detected Translation Errors from Google Translate	Punctuation Preposition Determiners (Article) Verb Form Noun Agreement Pronoun Conjunction	Wordy/Unclear Reference	Word Choice	Polite/Professional

The Article Clipping # (Number 1-8)

(The clipping contains Thai text, which is the source material for the translation task.)

1. Translated text by Google Translate via Google Lens

Instructions: Use your Google Translate application to translate Thai text into English using Google Lens. Copy and paste the English text below.

2. Grammarly correctness and rephrasing in round #1

Instructions: Paste the translated text by Google Translate in Number 1 on the Grammarly Application. When encountering errors in translation in Google Translate text, indicate which type of translation error is based on the table below, along with **red**, **blue**, **green**, and **purple** highlights, bolds, and underlines as determined by Grammarly.

Detected translation errors in round #1

Correctness Errors (Red underlines): _____

Clarity Errors (Blue underlines): _____

Engagement Errors (Green underlines): _____

Delivery Errors (Purple underlines): _____

3. Grammarly correctness and rephrasing in round #2

Instructions: Paste the Grammarly post-edited outputs round #1 on the Grammarly Application. When encountering errors in translation in Google Translate text, indicate which type of translation error is based on the table below, along with **red**, **blue**, **green**, and **purple** highlights, bolds, and underlines as determined by Grammarly.

Detected translation errors in round #

Correctness Errors (Red underlines): _____

Clarity Errors (Blue underlines): _____

Engagement Errors (Green underlines): _____

Delivery Errors (Purple underlines): _____

4. Final Grammarly post-edited outputs

Instructions: Paste the final Grammarly outputs from Number 3, which are all correct. The Grammarly Application says, Great Job or Well Done!

Figure 3.4 Online Student's Thai-English Translation Worksheet

Designing a Scoring System for the Online Student's Thai-English Translation Worksheet for Pre- and Post-Writing Ability Tests. The scoring system for the test was designed based on an in-depth analysis carried out by the Grammarly program. This analysis uncovered a range of translation errors prevalent in the outputs generated by Google Translate. These errors were categorized into 11 distinct types, each highlighted by a unique color: red, blue, green, and purple. The Google Translate outputs provided for the students originated from a selection of 8 clippings, which served as the foundation for the assessment. The students were tasked with a comprehensive challenge: they must identify all 11 types of grammatical errors present within the 8 clippings, tallying the total number of errors while also recognizing the specific colors associated with each error type. The students earned 1 point for each correct identification, while incorrect answers yielded no points. Calculating students' scores can refer to an answer sheet, a helpful guide throughout this evaluative process. (See Appendix 1, Section F)

Validating 8 Clippings and Translation Errors Tested in Thai-English Translation and Online Thai-English Translation Worksheet. The item objective congruence (IOC) was evaluated. Each expert provided feedback on different types of translation errors and assigned a rating of 1, 0, or -1 to each item. A score of 1 indicates the item is suitable and relevant. A score of 0 indicates uncertainty regarding the item's appropriateness and relevance, and a score of -1 signifies that the item is unsuitable or irrelevant.

Experts were instructed to assign a rating of 1, 0, or -1 based on their agreement with each statement. Items that received IOC scores between 0.5 and 1.0 were considered acceptable. The IOC ratings for eight examples and errors assessed in Thai-English translation, along with the online Thai-English translation worksheet, were 0.30, which is below the required threshold of 0.70.

Revising the Test According to Experts' Comments. The valuable feedback from experts has been thoughtfully evaluated, leading to significant enhancements. In response to their insightful suggestions, the researcher refined the instructional format

to better guide students and increased the number of panels for improved clarity. These expert recommendations were fully integrated, and the tests were conducted with a dedicated pilot group. The refined online Thai-English translation worksheet for students is presented in detail as follows: (See Appendix 5, Section D)

The original main instructions, the Grammarly correctness and rephrasing in round #1's instructions, and the Grammarly correctness and rephrasing in round #2's instructions, Since the target participants were upper secondary students, they may find long and complex instructions challenging to understand. The researcher should break down the instructions into more straightforward steps to make it easier for them, and rephrase to ease readers' understanding.

Instructions: Complete this form with 8 assigned clippings by correctly following the instructions attached to each item. When encountering errors in translation in Google Translate text, indicate which type of translation error is based on the table below, along with **red**, **blue**, **green**, and **purple** highlights, bolds, and underlines as determined by Grammarly. — correct translation errors in the Grammarly outputs as many rounds as needed until there are none.

They were modified to:

Complete this form with the 8 assigned clippings by following the instructions attached to each item. When you encounter translation errors in the text generated by Google Translate, indicate the type of error based on the table below. Use **red**, **blue**, **green**, and **purple** highlights, along with bold and underlined text, as indicated by Grammarly. Correct the translation errors in Grammarly's outputs as many rounds as needed until no errors remain.

The final Grammarly post-edited outputs' instructions needed to be rephrased, and the experts' comments were similar to those in the previous instruction section.

Paste the final Grammarly outputs from Number 3, which are all correct. The Grammarly Application says, Great Job or Well Done!

They were modified to:

Paste the final Grammarly outputs from Item #3, which should all be correct. When the text is error-free, the Grammarly application will display a message such as "Great Job" or "Well Done!"

Developing Instructional Periods for Training GT use with Grammarly (See Appendix 2, Section A-F) The researcher adapted the ADAPT approach that Knowles (2022) implemented to train English students in the effective use of Google Translate, guiding them through structured steps to enhance their translation skills while fostering critical awareness of the tool's limitations. With the integration of Grammarly AI-proofreading tools, Drolet (2023) developed a structured training program for English students to leverage Grammarly to enhance their writing skills, particularly in crafting problem-solving essays. The program involved submitting an initial draft, participating in one-on-one tutorials to discuss Grammarly's feedback on various writing elements, and engaging in self-revision using color-coded suggestions. Students first concentrated on addressing critical errors, submitted a second draft for instructor feedback, and then completed a post-revision survey to reflect on their experiences. Therefore, the researcher combined the ADAPT approach with color-coded suggestions to foster student autonomy in the training process and promoted the use of Google Translate with Grammarly as a valuable learning tool.

Table 3.5 Similarities between Teaching Steps of ADAPT Approach and Researcher's Instructional Periods, Color-Coded Suggestions Adapted

The ADAPT Approach	The Instructional Periods
Amending Assignments: Encouraging students to improve their use of Google Translate	Introduction to Google Translate with Grammarly, initial translation task

Table 3.5 Similarities between Teaching Steps of ADAPT Approach and Researcher's Instructional Periods, Color-Coded Suggestions Adapted (Cont.)

The ADAPT Approach	The Instructional Periods
Discussing Google Translate: Encouraging students to analyze translations critically	Teacher Presentation & Scaffolding: Learning about types of Google Translate's translation errors through mind-mapping and matching exercises, and Grammarly's proofreading tools
Assessing with Google Translate in Mind: Using rubrics and evaluation criteria	Students' Presentation: Identifying and classifying Google Translate's translation errors in Grammarly outputs when drafting writing assignments
Practicing Integrity, Teaching students about ethical use and avoiding over-reliance	Teacher's feedback: Revising and refining previous translations to demonstrate mastery

Source: Knowles, 2022; Drolet, 2023

The training commenced with an orientation session introducing students to Google Translate and outlining its capabilities and potential inaccuracies. This initial step ensured they recognized the benefits and risks of relying on machine translation. Following the orientation, students engaged in hands-on practice through a Translation Race. They translated Thai sentences into English using Google Translate and refined the results with Grammarly. This activity allowed them to identify common translation errors and develop strategies for improvement. Next, students explored error analysis, learning about 11 types of translation errors, including Punctuation, Preposition, Determiners (Article), Verb Form, Noun Agreement, Pronoun, Conjunction, Wordy/Unclear, Reference, Word Choice, and Polite/Professional. Through mind-mapping and matching exercises, they categorized and corrected these errors, reinforcing their understanding. The training then advanced to structured writing tasks, where students crafted a 250–300 word paragraph on a topic, utilizing Google Translate

as a drafting tool and Grammarly for post-editing. In the final stage, students revised and refined, revisiting their previous work based on instructor feedback. They re-evaluated their translations, applied post-editing techniques, and reflected on the importance of practicing integrity when using machine translation. This structured approach ensured that students improved their writing accuracy and developed a deeper understanding of using Google Translate responsibly and effectively.

Validating Four Lesson Plans in Instructional Periods

The researcher developed an evaluation form for the research instrument designed for the four lesson plans, which was validated by three experts in terms of content or objective validity. The item objective congruence (IOC) was assessed. Experts were required to provide feedback on each section of the sample lesson plan and indicate their ratings using a scale of 1, 0, and -1.

A rating of 1 signifies that the item is suitable and pertinent to the research study, 0 indicates uncertainty about the item's suitability and relevance, and -1 denotes that the item is unsuitable or irrelevant to the research study. Each expert was tasked with rating whether they concurred with each statement using 1, 0, or -1. Items with an IOC score ranging from 0.5 to 1.0 were considered acceptable. The IOC score for the four instructional periods was recorded at 0.30.

Revising Instructional Periods Following the Experts' Feedback

Three experts commented on revising and editing some parts of the lesson plan. The experts suggested that the lesson plan instruction format should be changed or kept consistent. Therefore, the researcher modified the instructions according to the experts' comments as follows: (See Appendix 5, Section E)

The original training objectives were specifically tailored to the students' current levels of English proficiency, with a primary focus on practical applications of technology rather than an extensive examination of language structure or the

comparison of differences between the structures of sentences, texts, idioms, sayings, proverbs, and poems in foreign languages and the Thai language. It was crucial to incorporate clear lesson objectives in each lesson plan to ensure that all learners could track their progress and understand the goals of their studies. In light of this, the researcher thoroughly revised the original objectives to deepen students' comprehension of technology and its intricate processes.

This revision focused on the connection between technology and the creation of everyday objects. By aligning teaching methods with technological processes, the curriculum aimed to give students a solid understanding of how technologies function in real-world contexts.

The researcher used various physical and digital models to illustrate different technological systems, fostering creativity and critical thinking in problem-solving. The course encouraged students to take responsibility for their technological engagement, empowering them to identify needs and create beneficial products. Ultimately, the goal was to foster technological literacy and collaboration among students.

Goals and Objectives of Instructional Periods

Goals: At the end of the training, students will be able to render Thai sentences into English sentences using Google Translate and correctly post-edit those raw English outputs with Grammarly to develop their EFL writing assignments.

Standards and Indicators in Basic Education Core Curriculum B.E. 2551 (A.D., 2008)

Strand 2: Language and Culture

Standard F2.2: Appreciation of similarities and differences between language and culture of native and Thai speakers and capacity for accurate and appropriate use of language

FL 2.2 / Grade 11-12 / 1. Explain or compare differences between the structures of sentences, texts, idioms, sayings, proverbs, and poems in foreign languages and the Thai language.

Objectives

Terminal Objectives

1) Students will be able to identify translation errors from raw Google Translate outputs.

2) Students will be able to post-edit those translation errors with Grammarly.

3) Students will be able to create correct sentences by using Google Translate with Grammarly

Enabling Objectives

1) Students will be able to classify translation errors from their raw Google Translate outputs into seven categories of types of translation errors.

2) Students will be able to post-edit those translation errors with Grammarly, given the post-editing level at the sentence level.

3) Students will be able to use Google Translate to render Thai sentences into English sentences and correctly post-edit those GT raw outputs with Grammarly as a proofreading tool.

4) Students will be able to use Google-Translate-Grammarly post-edited sentences to do EFL writing assignments.

They were modified to:

Goals and Objectives of Instructional Periods

Goals: At the end of the training, students will be able to render Thai sentences into English sentences using Google Translate and correctly post-edit those raw English outputs with Grammarly to develop their EFL writing assignments.

Standards and Indicators in Basic Education Core Curriculum B.E. 2551 (A.D., 2008)

Strand 2: Language and Culture

Standard F2.2: Understanding of the technology and technological processes; designing and making objects, utensils, or the methodologies through the creative technological processes; selective utilization of the technologies beneficial to one's life, society and the environment; participation in sustainable technological management

FL 2.2 / Grade 10-12 / 1. Explain and link the relationship between the technology and the other disciplines

FL 2.2 / Grade 11-12 / 3. Safely make objects and utensils or the methodologies in accord with the technological process by conveying the ideas through an image and models, leading to making things or conveying the concepts of the methodology through the models, and reporting on the results by using or presenting the achievements.

FL 2.2 / Grade 11-12 / 4. Have creativity in Problem-solving or responding to needs for their own products or development of others' products.

Objectives

Terminal Objectives

1) Students will be able to identify translation errors from raw Google Translate output by using Grammarly.

2) Students will be able to post-edit those translation errors with Grammarly.

3) Students will be able to create correct sentences by using Google Translate with Grammarly.

Enabling Objectives

1) Students will be able to classify translation errors from their raw Google Translate outputs into eleven categories of types of translation errors by using Grammarly

2) Students will be able to post-edit those translation errors with Grammarly, given the post-editing level at the sentence level.

3) Students will be able to use Google Translate to render Thai sentences into English sentences and correctly post-edit those GT raw outputs with Grammarly as a proofreading tool.

4) Students will be able to use Google-Translate-Grammarly post-edited sentences to do EFL writing assignments.

In the original first lesson plan, it would be highly beneficial for the researcher to implement structured interactive practice sessions during the Google Translate and Grammarly presentation. These sessions should allow students to actively engage with the tools, such as translating short paragraphs or correcting sentences using Grammarly, providing them with valuable hands-on experience that will significantly boost their familiarity and confidence in utilizing these resources in their writing. Moreover, to facilitate a focused and effective writing exercise, the researcher should clearly outline the expected paragraph length—specifying, for instance, that students should aim for 250-300 words—when inviting them to express their thoughts and creativity in writing about their dream date. This clear guideline helped students organize their ideas more effectively and encouraged concise and structured writing

2) Teacher's presentation (20 minutes)

Teacher displays Google Translate and teaches how to use it in general.

Teacher displays Grammarly and teaches how to use its features to complement Google Translate, including color codings: red, blue, green, purple

3) Students' presentation (25 minutes)

Students are tasked to write an English paragraph about their dream date by using Google Translate with Grammarly and submit it to the Teacher's Google Doc Account

4) Teacher's Feedback (15 minutes)

They were modified to:

2) Teacher's presentation (20 minutes)

Teacher displays Google Translate and teaches how to use it in general.

Teacher displays Grammarly and teaches how to use its features to complement Google Translate, including color codings: red, blue, green, purple

Teacher lets students use Google Translate with Grammarly with any text that can be found on the internet

2) Students' presentation (25 minutes)

Students are tasked to write an English paragraph about their dream date in 250-300 words by using Google Translate with Grammarly and submit it to the Teacher's Google Doc Account

5) Teacher's Feedback (15 minutes)

The fourth instructional period was thoughtfully integrated into the training program to enhance students' proficiency in post-editing texts utilizing Google Translate, complemented by the invaluable support of Grammarly for proofreading. After the students' engagement in the second and third instructional periods, the teacher decided to enrich the learning experience by incorporating hands-on practical exercises. As a result, students were invited to revisit and revise the paragraphs they crafted during the first lesson. Suppose they could skillfully identify the various errors and adeptly edit their paragraphs. In that case, it served as a testament to their comprehensive understanding of the material and achievement of the targeted enabling objectives. (See Appendix 2, Section D)

Developing Post-Training Questionnaire The questionnaire was adapted from Knowles's (2021) post-course questionnaire. The survey was intended to gather information about students' perceptions after participating in the training on using Google Translate with Grammarly and to garner more information about what they were willing to do once they had completed the training.

Checking Validity of Post-Training Questionnaire The researcher prioritized the quality of the research instrument by consulting experts to establish content validity across all five versions. Once this validity was confirmed, the researcher calculated the Index of Item Objective Congruence (IOC), which yielded a score of 1.00. (See Appendix 5, Section C)

Stage Two: Research Ethical Consideration

Submitting Research Proposal to Committee for Approval The researcher obtained the certificate of approval by the university institutional review board (IRB), and submitted the permission letter to the school's principal. (See Appendix 6-7)

Stage Three: Pilot Test & Students' Preparation

Piloting Research Instruments for Checking Reliability The researcher launched the questionnaires to 18 sampled students as a pilot test to examine the questionnaire's reliability. The reliability test for this research was processed on a computer program using Cronbach's alpha coefficient. The questionnaire reliability would be accepted if Cronbach's alpha coefficient was more than 0.70 (Cronbach,1951). The value of Cronbach's alpha coefficient of the Purposes and Attitudes in Using Google Translate Questionnaire was 0.933, of the Students' Perceptions of Using Grammarly Questionnaire was 0.741, the post-training questionnaire achieved a Cronbach's alpha of 0.764, and the Online Student's Thai-English translation worksheet was 0.782.

Piloting One of Instructional Period's Lesson Plans

The head English teacher authorized 8 classes within two weeks, each lasting 50 minutes for the researcher's data collection.

The researcher launched the course introduction on the website Mentimeter.com to gain the targeted students' attention and perspectives on AI-driven English tools. The AI platforms for using English classes that the students typically use are Google Translate (10 students), ChatGPT (7 students), and Grammarly (1 student).

The researcher piloted the first instruction period's lesson plan in the class. (See Appendix 2, Section A). The class experienced several difficulties that caused distress. Evaluating potential risks to participants was crucial for the university

institutional review board (IRB), as it involved understanding the various forms of discomfort the sampled students might face. By identifying these risks, the principal investigator took proactive steps to ensure a safer and more supportive environment for all the students involved. These discomforts refer to the loss of time and minor emotional risk. So, the researcher planned to manage adverse events as follows:

Loss of Time: The researcher incorporated additional estimated durations for four classes, each lasting 50 minutes, as well as the overall completion time for 12 classes on the consent form. It was important to reasonably overestimate these times to accommodate the participants who might take longer. The researcher also needed to anticipate potential delays when using online tools and programs such as Microsoft Word, Google Docs, Google Translate, and Grammarly. In practice, numerous technical challenges emerged. The students faced difficulties logging into the internet on their mobile devices, iPads, tablets, and the school's computers. Additionally, several computers experienced RAM failures due to overheating or overclocking. As a result, the school's technician had to resolve these issues, which further slowed down the computers and extended the duration of the first pilot class.

Minor emotional risks: Typical common but minor risks included mental fatigue, embarrassment, foreign language anxiety, or frustration when the students participated in the training program. The researcher was tasked with reviewing all research instruments, such as questionnaires, exercises on students' worksheets, and instructional periods' lesson plans, from the students' perspectives to determine if these emotions might be encountered. For example, a study activity in which the students must demonstrate in front of peers may cause embarrassment or frustration; the researcher integrates Cooperative Language Learning (CLL), a teaching method that emphasizes collaboration and interaction as key components of language acquisition. The students worked together in small groups to share information and complete assignments. The goal was to create a supportive environment where the students could practice the language, develop social skills, and learn from each other, with the teacher as a mere learning facilitator. The principal investigator proactively communicated with the student's English teachers and legal guardians should any new information

emerge about potential discomforts linked to this research. Notably, the students could withdraw from the study at any point and were compensated for their time if they experienced any mental health challenges. Their well-being was a priority. Suppose the students and the legal guardians experience physical or mental discomfort during the research. In that case, they could ask questions or file a formal complaint with the principal investigator.

English and Thai languages: Learning in both Thai and English became common in the pilot class, as students felt more engaged with the researcher's bilingual instructions than in a fully English environment. This situation underscored the need for an approach that values bilingualism. Using students' linguistic resources, pedagogical translanguaging was developed to enhance language and content skills. While this approach helped students leverage their abilities for better learning, their full potential was not realized due to the traditional monolingual practices in Thai government schools that isolated languages in the curriculum.

Even when the researcher sought to cultivate bilingual abilities, challenges arose. One concern was that students might become perplexed if they encountered more than one language at the same time. The optimal situation was when the school structure distinctly allocated times and spaces for each language. Moreover, providing ample exposure to the target language was vital for promoting effective bilingualism within the educational setting. The longstanding practice of keeping languages separate is present not only in institutions that teach majority languages to students from diverse home languages but also in those aimed at fostering bilingual skills across multiple languages. It is evident that prolonged exposure to the target language is crucial; however, there is also a considerable need to leverage what students already comprehend.

Pedagogical translanguaging fosters bilingualism in school settings and promotes an integrated language approach. This approach recognizes that languages can support one another, and prior linguistic knowledge can be leveraged as an advantage in the classroom.

Stage Four: Implementation

Implementing the pre-writing-test by using Google Translate and Grammarly questionnaires, and 8 clippings with the online student's Thai-English translation worksheet

Implementing the instructional period's lesson plans 1 to 4 for the training of Google Translate use with Grammarly

Implementing the post-writing test: using Google Translate and Grammarly questionnaires, and 8 clippings with the online student's Thai-English translation worksheet

Implementing the post-training questionnaire after the training of Google Translate use with Grammarly

Stage Five: Data Analysis

To evaluate the effectiveness of training GT use with Grammarly, the data were obtained from the pre-test and the post-test and statistically analyzed by mean scores (M), standard deviation (SD), and t-tests.

Analyzing the data from Google Translate and Grammarly questionnaires (Content analysis and quantitative), and the online student's Thai-English translation in the pre-test for eliciting pre-writing data

Analyzing the data from Google Translate and Grammarly questionnaires (Content analysis and quantitative), and the online student's Thai-English translation in Thai-English translation in the post-test for eliciting post-writing data

Analyzing the data from the post-training questionnaire for eliciting students' opinions towards the training of using Google Translate with Grammarly to enhance their writing ability

Data Analysis for Research Question One: What are the writing errors of Google Translate use from Thai to English for Thai upper secondary students?

Research question one aimed to show how many writing errors of Google Translate use in Thai to English translation for Thai upper secondary students? The answers were taken from open-ended questions in Part 5: Writing Errors found when using GT and solutions in Google Translate Questionnaires to show students' writing errors and how to correct those error identifications. Additionally, 8 clippings and errors tested in Online Student's Thai-English Translation Worksheet in the pre-writing ability tests were also used to answer this question. The data reported in the tables, categorized into 11 types of translation errors.

Data Analysis for Research Question Two: To what extent does the training in the use of Google Translate with Grammarly affect the Thai upper secondary students' EFL writing ability?

This second research question explored whether training students to use Google Translate alongside Grammarly impacts the English as a Foreign Language (EFL) writing skills of Thai upper secondary students. The outcomes from eight clippings and errors assessed in the Online Student's Thai-English Translation Worksheet during the pre-writing and post-writing ability evaluations were utilized to address this question. A t-test was conducted to compare the mean scores from the pre-writing and post-writing tests to identify any significant differences in the students' average scores. While the researcher analyzed the data, tables were used to display the mean scores, standard deviations, mean differences, t-values, and significance levels for all participants from both the pre-writing and post-writing assessments. The findings were presented in bar charts and classified into 11 categories of translation errors.

Data Analysis for Research Question Three: What are students' opinions towards the training of using Google Translate with Grammarly to enhance their writing ability?

All the answers to the third research question were taken from the post-training questionnaire (See Appendix 3), which was given at the end of the Google Translate use with Grammarly training to determine the students' perceptions of the training session and whether the training enhances their writing ability.

Table 3.6 Research Questions and Data Summarizing

Research Questions	Data Type	Data Analyzing
Research Question 1: What are the writing errors of Google Translate use from Thai to English for Thai upper secondary students?	- Open-ended answers of the students in Part 5: Writing Errors found when using GT and solutions - Translation Errors of the students in 8 clippings and errors tested in Online Student's Thai-English Translation Worksheet in the pre-writing test	Content Analysis Mean scores and Standard deviation
Research Question 2: To what extent does the training in the use of Google Translate with Grammarly affect the Thai upper secondary students' EFL writing ability?	- The Thai upper secondary students' EFL writing ability in the pre-writing test and the post-writing test	T-tests, Mean scores, and Standard deviation
Research Question 3: What are the students' opinions towards the training of using Google Translate with Grammarly to enhance their writing ability?	- The students' opinions towards the training of using Google Translate with Grammarly in the post-training questionnaire	Mean scores and Standard deviation

CHAPTER 4

RESEARCH RESULTS

This chapter presents the results from the research study to evaluate the effectiveness of training GT use with Grammarly. It is divided into three parts: the first part presents the results of the purposes and attitudes in using GT and the students' perception of using Grammarly questionnaires; the second part presents the results of the students' translation errors in the online student's Thai-English translation worksheet with 8 clippings in the pre-writing test and post-writing test, and the last part which presents the results of the post-training questionnaire.

4.1 RESULTS OF THE PURPOSES AND ATTITUDES IN USING GT AND STUDENTS' PERCEPTION OF USING GRAMMARLY QUESTIONNAIRES (See Appendix 4)

By providing an in-depth overview of the target students and highlighting their backgrounds, this summarized table enhances their varied viewpoints and prospects for Google Translate and Grammarly in Table 4.1

Table 4.1 Summarized Table, the Pre- and Post-Training Findings Compared Across All Key Areas.

Focus Area	Pre-Training Summary	Post-Training Summary
General Information	The majority of the respondents were female and all in the English program. Most people use Grammarly (free version) to check grammar and clarity. All used Google Translate (GT), and	Increased Grammarly usage, including more premium users. Google Translate usage decreased, but other machine translation remained common.

Table 4.1 Summarized Table, the Pre- and Post-Training Findings Compared Across All Key Areas (Cont.)

Focus Area	Pre-Training Summary	Post-Training Summary
	many relied on machine translation frequently.	
Purposes & Frequency of GT Use	Mainly used for reading websites, textbooks, and product labels. Writing applications focused on assignments and social media. Vocabulary learning and academic translation were common.	Continued high use for reading textbooks, focusing more on proverbs and news. Writing applications expanded to include emails and creative writing, emphasizing academic and idiom translation.
Attitudes Toward GT	Viewed GT as applicable for quick translations, vocabulary building, and writing assistance. Moderate confidence in accuracy, but some concerns about over-reliance.	Continued positive perception with increased trust in GT's speed and usefulness for lower-proficiency students. Concerns about reliance and critical thinking remained.
Grammarly Usage & Perception	Used primarily to reduce errors and supplement teacher feedback. Found grammar feedback helpful for confidence and skill improvement. Preferred Grammarly for clarity and grammar checking.	Same primary reasons for use, but greater emphasis on receiving grammar feedback on assignments. Appreciation for Grammarly's detailed feedback increased.

4.2 RESULTS OF THE STUDENTS' TRANSLATION ERRORS IN THE ONLINE STUDENT'S THAI-ENGLISH TRANSLATION WORKSHEET WITH 8 CLIPPINGS IN THE PRE- AND POST-WRITING TESTS

This part's results answer Research Question One: What are the writing errors of Google Translate use from Thai to English for Thai upper secondary students?

Research Question One was determined to assess the writing errors of Thai upper secondary students using Google Translate for Thai to English translation. It utilized open-ended answers in Part 5: Writing Errors found when using Google Translate and solutions identified in the Google Translate questionnaire in Table 4.2 and the students' translation errors in 8 clippings and errors tested in Online Student's Thai-English Translation Worksheet in the pre-writing data in Table 4.3

Table 4.2 Writing Errors Found When Using GT and Solutions

Items	Frequency	Percentage
Writing errors were found when using GT.		
Inaccurate and grammatically incorrect translations	10	27.00
The use of unnecessarily complex vocabulary and inconsistent word order	8	22.20
A reliance on Internet access	3	8.30
Problems with difficult word choices	4	11.10
Unnatural sentence structures	3	8.30
The lack of new vocabulary translation	3	8.30
Occasional impolite language	2	5.60
Slow processing	3	8.30
Total	36	100.00
Solutions		
Seeking help from an English teacher	2	5.60
Trying translating the sentence using other applications	15	41.70

Table 4.2 Writing Errors Found When Using GT and Solutions (Cont.)

Items	Frequency	Percentage
Asking Chat GPT or another app for a revised grammatically improved version	10	27.80
Carefully review and verify the translated text	9	25.00
Total	36	100.00

Table 4.2 outlines the writing errors encountered when using Google Translate (GT) and the corresponding solutions. The most frequent issue was inaccurate and grammatically incorrect translations (27.00%), highlighting GT's limitations in maintaining grammatical accuracy. The use of unnecessarily complex vocabulary and inconsistent word order followed (22.20%), suggesting difficulties in producing natural-sounding translations. Problems with difficult word choices (11.10%) also contributed to translation errors. Additionally, issues such as reliance on Internet access (8.30%), unnatural sentence structures (8.30%), lack of new vocabulary translation (8.30%), and slow processing (8.30%) were reported at similar rates. Occasional impolite language appeared as a minor issue (5.60%).

To address these challenges, students primarily opted for alternative translation applications (41.70%), indicating a preference for cross-verifying results. A significant portion (27.80%) sought assistance from AI tools like ChatGPT for grammatically improved revisions, while others (25.00%) carefully reviewed and verified the translated text themselves. Seeking help from an English teacher was the least utilized strategy (5.60%), suggesting a reliance on digital tools over human guidance. These findings underscore the need for multiple strategies to enhance translation accuracy and readability when using GT.

Table 4.3 Students' Translation Errors in the Pre-Writing Test

Translation Errors	Pre-writing test	
	\bar{x}	S.D.
Punctuation	2.56	2.28

Table 4.3 Students' Translation Errors in the Pre-Writing Test (Cont.)

Translation Errors	Pre-writing test	
	\bar{x}	S.D.
Punctuation	2.56	2.28
Preposition	3.89	0.32
Determiners (Article)	6.00	1.00
Verb Form	3.44	1.14
Noun Agreement	6.89	0.32
Pronoun	6.83	0.70
Conjunction	3.28	1.22
Wordy/Unclear	3.44	3.18
Reference	3.83	0.38
Word Choice	3.67	1.02
Polite/Professional	5.83	0.92

Table 4.3 presents the students' translation errors in the pre-writing test, highlighting various linguistic challenges. The most frequent errors were in noun agreement ($M = 6.89$, $SD = 0.32$) and pronoun usage ($M = 6.83$, $SD = 0.70$), indicating significant difficulties in grammatical consistency. Errors in determiners, specifically articles, were also notable ($M = 6.00$, $SD = 1.00$). Politeness and professional tone issues ($M = 5.83$, $SD = 0.92$) suggest challenges in appropriate language use. Prepositions ($M = 3.89$, $SD = 0.32$) and reference errors ($M = 3.83$, $SD = 0.38$) were moderately frequent. Mistakes in word choice ($M = 3.67$, $SD = 1.02$), verb forms ($M = 3.44$, $SD = 1.14$), and conjunctions ($M = 3.28$, $SD = 1.22$) show varying struggles with sentence structure. Wordiness and unclear expressions ($M = 3.44$, $SD = 3.18$) indicate a need for conciseness. Punctuation errors ($M = 2.56$, $SD = 2.28$) were relatively lower, but still present. These findings suggest that students face challenges across multiple aspects of translation, with noun agreement and pronoun errors being the most prevalent.

This part's results answer Research Question Two: To what extent does the training in the use of Google Translate with Grammarly affect the Thai upper secondary students' EFL writing ability?

The second research question explored whether training with Google Translate and Grammarly influences the EFL writing skills of the Thai upper secondary students. The study examined the outcomes of the Online Student's Thai-English Translation Worksheet in pre- and post-writing assessments, shown in Table 4.4. To assess significant differences, mean scores were analyzed using a t-test. The results, which included mean scores, standard deviations, t-values, and significance levels, were visually represented in Figure 4.1, displayed in bar charts, and organized into 11 categories of translation errors.

Table 4.4 T-Tests between Writing Tests and Translation Errors of Students in 8 Clippings Tested in the Online Student's Thai-English Translation Worksheet.

Writing Tests and Translation Errors	Pre-writing test		Post-writing test		t	Sig. (2-tailed)
	\bar{X}	S.D.	\bar{X}	S.D.		
Punctuation	2.56	2.28	4.00	2.78	1.702	.098
Preposition	3.89	0.32	5.00	1.84	2.514	.022*
Determiners (Article)	6.00	1.00	5.89	1.18	.399	.695
Verb Form	3.44	1.14	4.28	1.52	1.851	.073
Noun Agreement	6.89	0.32	6.83	0.92	.241	.812
Pronoun	6.83	0.70	6.72	0.66	.484	.631
Conjunction	3.28	1.22	4.72	1.63	2.994	.005*
Wordy/Unclear	3.44	3.18	6.94	2.71	3.550	.001*
Reference	3.83	0.38	4.78	1.43	2.694	.014*
Word Choice	3.67	1.02	5.78	1.62	4.649	.000*
Polite/Professional	5.83	0.92	7.72	0.57	7.368	.000*

*Significant at level 0.05

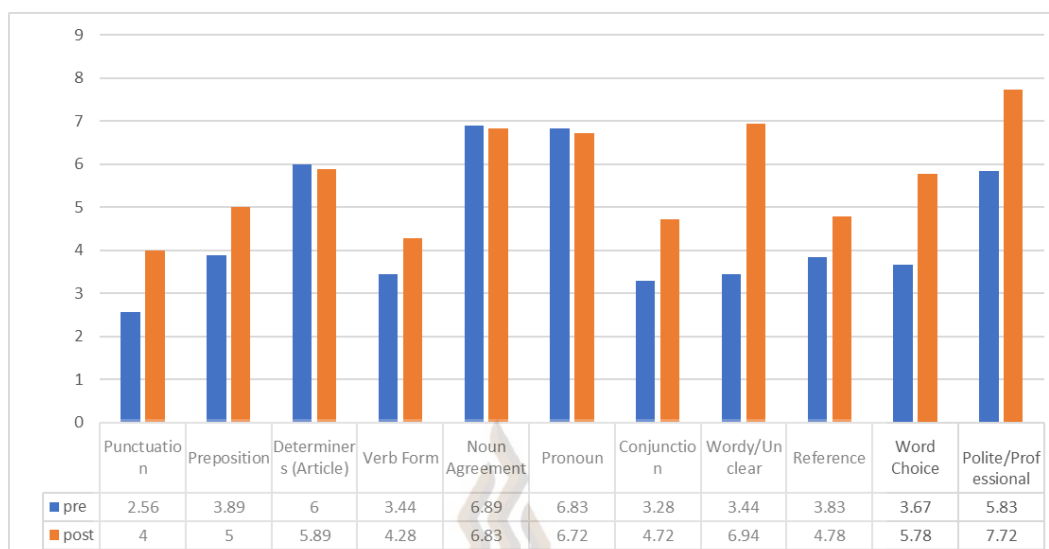


Figure 4.1 Writing Test Scores and Translation Errors of the Students in the Online Student's Thai-English Translation Worksheet with 8 Clippings

The results from Table 4.4 show that the post-test mean scores ($\bar{X}= 4.00$, S.D = 2.78) on the punctuations were not significantly higher than the pre-test score ($\bar{X} = 2.56$, S.D = 2.28). From the t-value of 1.702 and the significance level of .098 ($p>0.05$), it can be seen that after the students were trained in the use of Google Translate with Grammarly, their writing test and translation errors of punctuation were not improved significantly in the post-test.

The post-test means scores ($\bar{X}=5.00$, S.D = 1.84) on prepositions were significantly higher than the pre-test ($\bar{X}= 3.89$, S.D = 0.32). From the t-value of 2.514 and significance level of .022 ($p<0.05$), it can be seen that after the students were trained in the use of Google Translate with Grammarly, their writing test and translation errors of prepositions improved significantly in the post-test.

The post-test mean scores ($\bar{X}=5.89$, S.D = 1.18) on determiners were not significantly higher than the pre-test ($\bar{X}=6.00$, S.D = 1.00). From the t-value of 0.399 and significance level of .695 ($p>0.05$), it can be seen that after the students were trained in using Google Translate with Grammarly, their writing test and translation errors of determiners did not improve significantly in the post-test.

The post-test mean scores ($\bar{X}=4.28$, S.D = 1.52) on verb forms were not significantly higher than the pre-test ($\bar{X}=3.44$, S.D = 1.14). From the t-value of 1.851 and significance level of .073 ($p>0.05$), it can be seen that after the students were trained in using Google Translate with Grammarly, their writing test and translation errors of verb forms did not improve significantly in the post-test.

The post-test mean scores ($\bar{X}= 6.83$, S.D = 0.92) on noun agreement were not significantly higher than the pre-test ($\bar{X}= 6.89$, S.D = 0.32). From the t-value of 0.241 and significance level of .812 ($p>0.05$), it can be seen that after the students were trained in the use of Google Translate with Grammarly, their writing test and translation errors of noun agreement did not significantly improve in the post-test.

The post-test mean scores ($\bar{X}= 6.72$, S.D = 0.66) on pronouns were not significantly higher than the pre-test ($\bar{X}= 6.83$, S.D = 0.70). From the t-value of 0.484 and significance level of .631 ($p>0.05$), it can be seen that after the students were trained in using Google Translate with Grammarly, their writing test and translation errors of the pronoun were not significantly improved in the post-test.

The post-test mean scores ($\bar{X}=4.72$, S.D = 1.63) on conjunctions were significantly higher than the pre-test ($\bar{X}= 3.28$, S.D = 1.22). From the t-value of 2.994 and significance level of .005 ($p<0.05$), it can be seen that after the students were trained in the use of Google Translate with Grammarly, their writing test and translation errors of conjunctions improved significantly better in the post-test.

The post-test mean scores ($\bar{X}= 6.94$, S.D = 2.71) on Wordy/Unclear were significantly higher than the pre-test ($\bar{X}= 3.44$, S.D = 3.18). From the t-value of 3.550 and significance level of .005 ($p<0.05$), it can be seen that after the students were trained in the use of Google Translate with Grammarly, their writing test and translation errors of Wordy/Unclear improved significantly better in the post-test.

The post-test mean scores ($\bar{X}= 4.78$, S.D = 1.43) on reference were significantly higher than the pre-test ($\bar{X}= 3.83$, S.D = 0.38). From the t-value of 2.694

and significance level of .014 ($p < 0.05$), it can be seen that after the students were trained in the use of Google Translate with Grammarly, their writing test and translation errors of reference improved significantly better in the post-test.

The post-test mean scores ($\bar{X} = 5.78$, S.D = 1.62) on word choices were significantly higher than the pre-test ($\bar{X} = 3.67$, S.D = 1.02). From the t-value of 4.649 and significance level of .000 ($p < 0.05$). From this result, it can be seen that after the students were trained in the use of Google Translate with Grammarly, their writing test and translation errors of word choices improved significantly in the post-test.

The post-test mean scores ($\bar{X} = 7.72$, S.D = 0.57) on Polite/Professional were significantly higher than the pre-test ($\bar{X} = 5.83$, S.D = 0.92). From the t-value of 7.368 and significance level of .000 ($p < 0.05$), it can be seen that after the students were trained in the use of Google Translate with Grammarly, their writing test and translation errors of Polite/Professional improved significantly better in the post-test.

4.3 RESULTS OF POST-TRAINING QUESTIONNAIRE

This part's results answer Research Question 3: What are the students' opinions towards training to use Google Translate with Grammarly to enhance their writing ability?

The responses to the third research question were obtained from the post-training questionnaire, which was administered after the Google Translate and Grammarly training session. This questionnaire evaluated the students' perceptions of the training and ascertained whether it effectively enhanced their writing abilities in Tables 4.5 to 4.8

Table 4.5 General Information about the Post-Training Activities

Items	Frequency	Percentage
Did you finish all the activities in the training?		
Yes	16	88.90

Table 4.5 General Information about the Post-Training Activities (Cont.)

Items	Frequency	Percentage
No	2	11.10
Total	18	100.00
What was the most beneficial part of this training?		
Activity 1: Google Translate Use with Grammarly features	10	22.80
Activity 2: Introduction to 11 Types of Translation Errors Part 1	13	29.50
Activity 3: Introduction to 11 Types of Translation Errors Part 2	13	29.50
Activity 4: Conclusion Google Translate Use with Grammarly features	8	18.20
Total	44	100.00
What was the least beneficial part of this assignment?		
Activity 1: Google Translate Use with Grammarly features	11	32.40
Activity 2: Introduction to 11 Types of Translation Errors Part 1	8	23.50
Activity 3: Introduction to 11 Types of Translation Errors Part 2	8	23.50
Activity 4: Conclusion Google Translate Use with Grammarly features	7	20.60
Total	34	100.00

Table 4.5 shows that the largest group, consisting of 16 respondents (88.90% of the total), finished all the activities in the training. The other group, consisting of 2

respondents (11.10% of the total), did not finish all the activities in the training. The largest group, consisting of 13 respondents (29.50% of the total), chose Activity 2: Introduction to 11 Types of Translation Errors Part 1 and Activity 2: Introduction to 11 Types of Translation Errors Part 2 as the most beneficial part of the training. The second group of 10 respondents (21.70% of the total) chose Activity 1: Google Translate Use with Grammarly features. The third group, consisting of 8 respondents (18.20%), chose Activity 4: Conclusion Google Translate Use with Grammarly features. The largest group, consisting of 11 respondents (32.40% of the total), chose Activity 1: Google Translate Use with Grammarly features as the least beneficial part of the training. The second group, consisting of 8 respondents (21.70% of the total), chose Activity 2: Introduction to 11 Types of Translation Errors Part 1 and Activity 2: Introduction to 11 Types of Translation Errors Part 2. The third group, consisting of 7 respondents (20.60% of the total), chose Activity 4: Conclusion Google Translate Use with Grammarly features.

Table 4.6 Perceptions of Google Translate Use with Grammarly

Items	Mean	S.D.	Scale
After completing the Google Translate with Grammarly, I felt more prepared to use Google Translate with Grammarly well.	4.28	0.75	Very High
The Google Translate with Grammarly assignment was beneficial to me.	4.39	0.60	Very High
The Google Translate with Grammarly assignment was busy work.	3.72	1.07	High
The Google Translate with Grammarly assignment made me feel more confident translating Thai-English during the training.	4.11	0.96	High
The Google Translate with Grammarly assignment made me more reluctant to translate Thai- English during the training.	4.11	1.07	High

Table 4.6 Perceptions of Google Translate Use with Grammarly (Cont.)

Items	Mean	S.D.	Scale
Overall, The Google Translate with Grammarly assignment was beneficial in terms of learning writing English.	4.22	0.87	Very High
Average scores	4.14	0.61	High

Table 4.6 shows that the Perceptions of Google Translate Use with Grammarly were generally high, with some situations rated very high. The Google Translate with Grammarly assignment was perceived as the most beneficial, obtaining the highest mean score (\bar{X} = 4.39). This was followed by “After completing the Google Translate with Grammarly, I felt more prepared to use Google Translate with Grammarly well” (\bar{X} = 4.28) and “Overall, the Google Translate with Grammarly assignment was beneficial in terms of learning English writing” (\bar{X} = 4.22). Respondents also agreed that the assignment “made me feel more confident translating Thai-English during the training” (\bar{X} = 4.11). The lowest-rated aspect was the perception that “The Google Translate with Grammarly assignment was unnecessary work” (\bar{X} = 3.72). The overall result indicates a high positive perception towards Google Translate Use with Grammarly (\bar{X} = 4.14, S.D. = 0.61).”

Table 4.7 Reasons that Students Use Google Translate with Grammarly after the Training

Items	Frequency	Percentage
I am not confident in my own work.	11	24.40
I run out of time and must complete the assignment before the deadline.	8	17.80
I want to complete an English activity/assignment.	9	20.00

Table 4.7 Reasons that Students Use Google Translate with Grammarly after the Training (Cont.)

Items	Frequency	Percentage
I want to check my understanding of a text.	10	22.20
I wanted to compare my written work to a translation.	7	15.60
Total	45	100.00

Table 4.7 shows that from the total of 18 respondents, the largest group, consisting of 11 respondents (24.40%), chose “I am not confident in my own work “as their primary reason for using Google Translate with Grammarly after the training. The second group, comprising 10 respondents (22.20% of the total), chose “I want to check my understanding of a text”. The third group, consisting of 9 respondents (20.00% of the total), chose “I want to complete an English activity/assignment.”. The fourth group, consisting of 8 respondents (17.80% of the total), chose “I run out of time and must complete the assignment before the deadline.” The last group, consisting of 7 respondents (15.60% of the total), chose “I wanted to compare my written work to a translation.”.

Table 4.8 Perceptions of Google Translate Use with Grammarly

Items	mean	S.D.	scale
I feel Google Translate use with Grammarly is a beneficial tool for learning a language.	4.33	0.68	Very High
I feel Google Translate use with Grammarly will help me pass the class.	4.33	0.59	Very High
I would recommend this training of Google Translate use with Grammarly to other students.	4.11	0.83	High
Average scores	4.26	0.62	Very High

Table 4.8 shows that the Perceptions of Google Translate Use with Grammarly were generally high, with some situations rated very high. I feel Google Translate use with Grammarly is a beneficial tool for learning a language, and I feel Google Translate use with Grammarly will help me pass the class, obtaining the highest mean score ($\bar{X} = 4.33$). This was followed by “I would recommend this training of Google Translate use with Grammarly to other students.” ($\bar{X} = 4.11$). The overall result indicates a high positive perception towards Google Translate Use with Grammarly ($\bar{X} = 4.26$, S.D. = 0.62).”



CHAPTER 5

SUMMARY, DISCUSSIONS, AND RECOMMENDATIONS

This study investigated the use of Google Translate with Grammarly to enhance English writing skills among Thai upper secondary students. The objectives included identifying common writing errors from Google Translate, evaluating the effectiveness of training on Google Translate with Grammarly, and gathering student perspectives after training. The research targeted 18 tenth-grade students, aged 16-17, from the Thai government school in Chiang Mai, specifically those in an English-Arts major with prior experience using Google Translate for assignments. Employing a one-group pretest-posttest design, the target participants received training on using both tools before and after assessing their writing performance. The data were collected through questionnaires and translation exercises to measure changes in writing proficiency and perceptions.

This chapter presents a summary of the findings, discussions, pedagogical implications, recommendations for further research, and limitations.

5.1 SUMMARY OF THE FINDINGS

Purposes and Attitudes in Using Google Translate and Students' Perceptions of Using Grammarly Questionnaires

The following text summarizes demographic and usage data from 18 participants before and after training. After the post-training, Google Translate usage declined, while other machine translation options remained steady. Notably, adoption of Grammarly increased, especially its premium version, with a shift towards prioritizing clarity over grammar checking. Although interest in learning English was strong, a few students disliked English after the training.

For using Google Translate (GT) before and after training, focusing on reading, writing, vocabulary learning, and translation. Before the training, students mainly used GT to read websites, English textbooks, product labels, and advertisements. After training, textbook reading remained significant, but interest in epigrams, proverbs, and news articles increased. In writing, students initially relied on GT for assignments and social media. Post-training, assignments were still primary, but use for emails and creative writing, like poetry, grew. Vocabulary learning was important throughout, with a shift towards learning the names of places and institutions after training. Academic passages were the most common in translation before and after training, with increased reliance on GT for external reading materials and idioms. Overall, training influenced a broader and more academic application of Google Translate. The students initially viewed GT positively for its speed and vocabulary enhancement, though they had moderate confidence in its accuracy, particularly for English-Thai translations. Some felt it hindered critical thinking. After training, they maintained a positive outlook, appreciating its effectiveness for lower-proficiency learners, but concerns about reliance on it persisted.

For the use of Grammarly and student perceptions before and after the training. Initially, students used Grammarly to reduce writing errors and complement teacher feedback. After training, these reasons remained important, but the influence of teacher recommendations slightly decreased. Students valued Grammarly for improving language skills and providing clear explanations of errors. After the training, the focus on grammar feedback for assignments grew stronger. Grammarly's strengths included helpful grammar suggestions and performance scoring, though some students preferred lecturer feedback, and a few found suggestions inaccurate. Overall, appreciation for Grammarly's detailed feedback increased after the training.

Students' Writing Errors in Google Translate and Results of Translation Errors in Pre-Writing Test

Thai upper secondary students often encounter writing errors when using Google Translate (GT) for Thai-to-English translations. A common issue is that GT

frequently produces inaccurate and grammatically incorrect translations, affecting sentence structure and coherence. Many students struggle with complex vocabulary and inconsistent word order, leading to unnatural translations. Problems with word choice, verb forms, and conjunctions also contribute to difficulties in constructing clear and grammatically correct sentences.

To improve translation quality, students frequently seek alternative translation applications and utilize AI-based tools like ChatGPT for refined versions of their texts. While some students manually review their translations, few seek assistance from English teachers, indicating a preference for digital tools.

In the pre-writing test, the translation errors of the students in 8 clippings and errors tested in the online student's Thai-English translation worksheet found the Noun Agreement received the high mean scores (\bar{X} = 6.89, S.D = 0.32). This was followed by Pronoun mean scores (\bar{X} = 6.83, S.D = 0.70). Determiners (Article) mean scores were (\bar{X} = 6.00, S.D = 1.00). Polite/Professional mean scores were (\bar{X} = 5.83, S.D = 0.92). Preposition mean scores were (\bar{X} = 3.89, S.D = 0.32). The reference mean scores were (\bar{X} = 3.83, S.D = 0.38). Word Choice mean scores were (\bar{X} = 3.67, S.D = 1.02). Wordy/Unclear mean scores were (\bar{X} = 3.44, S.D = 3.18). Verb Form mean scores were (\bar{X} = 3.44, S.D = 1.14). Conjunction mean scores were (\bar{X} = 3.28, S.D = 1.22). The lowest mean scores were Punctuation (\bar{X} = 2.56, S.D = 2.28).

Students' Translation Errors in Online Student's Thai-English Translation Worksheet with 8 Clippings in Pre-Writing and Post-Writing Tests.

The t-test or independent was used to test between the writing test and translation errors of the students in 8 clippings and errors tested in the Online Student's Thai-English Translation Worksheet; significance was found between the writing test and Translation Errors of the students in 8 clippings and errors tested in the Online Student's Thai-English Translation Worksheet. According to the table, it can be found that the independent (writing test) can predict the dependent variable at a significant

0.05 (Sig. < 0.05) by seeing with $T=4.482$ and Sig 0.000 (p-value less than 0.05). A significance was found in this result, which means the pre-writing and post-writing tests have translation errors for the students in 8 clippings, and the errors tested in the Online Student's Thai-English Translation Worksheet are the differences.

This study evaluates the impact of training in Google Translate (GT) with Grammarly on the English writing abilities of Thai upper secondary students. The findings indicate substantial improvements in various aspects of writing following the training. Noteworthy advancements were observed in appropriately using prepositions, conjunctions, reference words, word choice, and maintaining a polite and professional tone. These results suggest that the training effectively enhanced coherence, sentence flow, and overall student writing appropriateness. Furthermore, there was a significant decrease in wordy or unclear sentences, reflecting a better grasp of conciseness and readability. However, certain grammatical elements—such as punctuation, determiners, verb forms, noun agreement, and pronoun usage—did not show marked improvement after the training. This indicates that while GT and Grammarly were advantageous in refining specific writing aspects, they had a limited effect on fundamental grammar rules that require a deeper conceptual understanding. Overall, the training produced noticeable enhancements in lexical choices, sentence structure, and writing clarity, although ongoing grammatical challenges point to the necessity for additional instructional support.

Post-Training Questionnaire

The overall positive perception towards Google Translate Use with Grammarly indicates a high level ($\bar{X} = 4.14$, S.D. = 0.61), the largest group comprises 11 respondents (24.40% of the total). Most students completed all training activities, finding the sessions on translation errors particularly beneficial. These helped them identify and correct common mistakes in their writing. However, some felt the first activity on using Google Translate with Grammarly, which was also used in the pilot session, was less useful, as they were already familiar with these tools. The concluding session received mixed feedback, with some students finding it helpful while others

viewed it as less impactful. These findings suggest that students valued hands-on learning experiences that addressed translation challenges, reinforcing the importance of error identification and correction in developing their English writing skills.

Students regarded the integration of Google Translate and Grammarly positively, acknowledging its effectiveness in enhancing their writing skills and translation accuracy. Many reported feeling more prepared and confident in using both tools after their training. Although some viewed the assignments as additional work, they recognized their value in advancing language proficiency. Overall, the training improved their translation accuracy and fostered a greater awareness of potential errors in their writing. Students found this combination to be a practical and supportive resource for their language development.

The students continued using Google Translate with Grammarly after their training primarily because they lacked confidence in their writing abilities. Many students relied on these tools to ensure grammatical accuracy and coherence in their work. Another significant motivation was the desire to verify their understanding of texts, indicating that students utilized Google Translate with Grammarly as a learning aid rather than solely as a translation tool. Some students employed these resources to efficiently complete assignments, while others sought them out when pressed for time, underscoring their importance in helping meet deadlines. Additionally, a smaller group of students used the tools to compare their written work with translated versions, reflecting a desire to refine their writing through cross-referencing. Overall, the findings suggest that students regarded Google Translate with Grammarly as an invaluable resource for enhancing writing accuracy, improving comprehension of English texts, and effectively managing academic tasks.

The students had a highly positive perception of using Google Translate with Grammarly for language learning. They found the tools beneficial for improving their writing skills and expressed confidence in achieving academic success. Many regarded the combination as a reliable support system for enhancing their English writing,

reducing errors, and increasing clarity. A significant number of students indicated they would recommend this training to peers, highlighting their satisfaction.

Overall, the findings indicate that the training successfully enhanced both writing skills and confidence in using translation tools. These tools are seen as valuable resources in helping students become more proficient and confident in their English writing.

5.2 DISCUSSIONS

The results are discussed based on the research objective 1) to identify the writing errors of Thai upper secondary students caused by using Google Translate from Thai to English, 2) to examine the effect of the training in the use of Google Translate with Grammarly on the Thai upper secondary students' EFL writing ability, and 3) to explore the students' opinions after the training on the use of Google Translate with Grammarly to enhance their English writing ability.

Research Question One: What are the writing errors of Google Translate use from Thai to English for Thai upper secondary students?

Thai upper secondary students experienced writing challenges due to the inaccuracies and grammatical flaws in Google Translate (GT) translations. This leads to sentence structure, vocabulary, and word order issues, resulting in unnatural translations, reliance on internet access, and slow processing. While many students seek alternative translation applications or AI tools like ChatGPT, only a few consult English teachers for assistance.

Common pre-writing mistakes often include 11 issues with noun agreement, pronouns, determiners, maintaining a polite or professional tone, using appropriate prepositions, reference, selecting word choices, wordy or unclear sentences, verb forms, and conjunctions. Generally, punctuation tends to have the fewest errors compared to these other areas, whereas, according to Tongpoon-Panatasorn & Griffith (2020), the

translation errors produced by Google Translate had 15 types. It underscores notable advancements in Google Translate's AI capabilities between 2020 and 2024, particularly in syntax and semantics. The introduction of the Adaptive Translation feature in February 2024 significantly enhances the user experience by utilizing a dataset of up to 30,000 expertly translated examples. This improvement leads to a quality enhancement of up to 23% (Weldom & Modi; Google Cloud, 2024), reflecting Google's dedication to advancing translation technology and offering users more accurate translations for improved communication across languages.

Research Question Two: To what extent does the training in the use of Google Translate with Grammarly affect Thai upper secondary students' EFL writing ability?

Learning English involves mastering four essential skills: listening, speaking, reading, and writing. Among these, writing is often regarded as the most challenging. This difficulty has prompted the exploration of various tools and techniques to assist learners. One effective approach is the integration of Google Translate and Grammarly, according to research conducted by Hartono et al. (2022), combining these two resources can significantly enhance writing abilities. The researchers developed a new application called Google Translate with Grammarly Combination (GTG-Com). This application was designed for individuals looking to translate Indonesian scientific articles into English. GTG-Com operated online and was a dedicated space for translating Indonesian texts into English. It utilized the translation capabilities of Google Translate and then followed up with the editing features of Grammarly, resulting in polished, well-edited English text. The GTG-Com application offered a convenient solution for text translation, producing more accurate and readable translations quickly and efficiently. Consequently, the researcher designed and conducted the instructional periods in the training in the use of Google Translate with Grammarly, adapted ADAPT approach of Knowles (2022) and Grammarly's color-coded suggestions of Drolet (2023) to foster Thai EFL students' writing ability.

Elevating insights, before and after the training, the target students were tasked to do pre-writing and post-writing tests in the online students' Thai-English translation

worksheet to compare the students' pre-writing and post-writing data results. This shows the extent to which the training in the use of Google Translate with Grammarly affects the students. Regarding proofreading 11 translation errors of Google Translate outputs in this study, the independent t-test assessed the relationship between students' writing test scores and translation errors across 8 clippings, including those from the online Thai-English translation worksheet. A significant correlation was found, indicating that the writing test predicts translation errors at the 0.05 level ($t = 4.482$, $p < 0.000$). This suggests a notable difference in translation errors between the pre-writing and post-writing tests for the students.

The study's findings compellingly demonstrate that students trained in using Google Translate with Grammarly experienced remarkable improvements in their writing abilities. Specifically, there was a significant reduction in translation errors related to Prepositions, Conjunctions, Wordy/Unclear phrases, References, Word Choice, and Politeness/Professionalism in the post-test when compared to the pre-test. The average scores in the post-test showcased a striking increase over those in the pre-test. However, it is crucial to highlight that no significant advancements were observed in errors related to Punctuation, Determiners, Verb Forms, Noun Agreement, and Pronouns after the training. This underscores the effectiveness of the training program while also identifying areas where further improvement is needed. It can be deduced that the GTG-Com app, which combines Google Translate and Grammarly, significantly improves the quality of translations, as Hartono (2024) indicated that the accuracy of translations transitioned from inaccurate to less accurate by 60%, and from less accurate to accurate by 40%. This led to an increase in the scores from 1.4 to 2.6. Consequently, the average progress score for each student is 2.

Regardless of the platform selected by students, a mobile application, a comprehensive website, or specialized educational software, powerful tools like Google Translate with Grammarly for translating texts from their second language into English have demonstrated remarkable effectiveness. This approach not only aids students in comprehending the intricate nuances of the English language but also plays a crucial role in significantly enhancing their writing skills. Google Translate allows students to

quickly convert text and identify contextual meanings, while Grammarly provides real-time corrections and tailored suggestions that improve grammar, style, and vocabulary usage. Together, these tools empower students to produce polished and articulate written work, fostering confidence and proficiency in their English language capabilities.

Research Question Three: What are students' opinions towards the training of using Google Translate with Grammarly to enhance their writing ability?

After the training of Google Translate with Grammarly, Knowles' (2022) study played a crucial role in shaping students' perceptions of Grammarly by providing a structured framework that supported their learning process in this study. The instructional periods, which were adapted from the ADAPT approach, trained students to evaluate Google Translate outputs critically. Through hands-on activities, such as the Translation Race and Grammarly-assisted editing exercises and suggestions (Drolet, 2023), the students cultivated a deeper understanding of how to utilize both Google Translate and Grammarly effectively. The post-training questionnaire collected training completion status from the students. It evaluated the most and least beneficial sessions on Google Translate and Grammarly. Using a five-point Likert scale, it measured students' perceptions of their preparedness, confidence, and the training's usefulness. The questions focused on their ability to use Google Translate with Grammarly, confidence in Thai-English translations, and the assignment's value. Lastly, students were invited to recommend the training to peers, reflecting their overall satisfaction and perceived effectiveness.

The study revealed a remarkable enthusiasm among students for using Google Translate with Grammarly, who rated its efficacy in enhancing writing skills and translation accuracy at an impressive average of 4.14. Most students were fully engaged in all training activities, especially valuing the sessions dedicated to identifying translation errors. Although some found the first activity somewhat redundant, feedback on the concluding session varied, highlighting the different learning journeys. Throughout, students embraced a hands-on approach to learning and recognized the invaluable role these tools played in elevating their language proficiency.

In the post-training, students continued to use the tools, driven by a desire for confidence in their writing and a commitment to grammatical precision. Many turned to Google Translate with Grammarly to deepen their understanding of texts, tackle assignments, and refine their writing through insightful comparisons. A strong majority felt empowered in their pursuit of academic success and eagerly recommended the training to their peers. Ultimately, the findings demonstrate that the training enhanced writing skills and nurtured a newfound confidence in utilizing translation tools, which are celebrated as essential allies in the language development journey.

Hence, integrating Google Translate and Grammarly in English as a Foreign Language (EFL) writing instruction presents a compelling opportunity for enhancement. By implementing a structured writing session that leverages Google Translate with Grammarly for post-editing of machine translations, Thai upper secondary students can significantly empower students to achieve greater accuracy in translating texts from Thai to English. This innovative approach can potentially transform writing tasks in Thailand, making them more effective and precise.

5.3 PEDAGOGICAL IMPLICATIONS

The findings of this study suggest 3 pedagogical implications, such as the alternative instructional model of AI Translation with proofreading tools to create curricula and trainings to enhance digital literacy, enhancing language awareness: pedagogical translanguaging, and addressing the over-reliance on AI-Machine Translation in EFL learning.

Alternative Instructional Model of AI Translation with Proofreading Tools to Create Curricula, or Trainings to Enhance Digital Literacy

Digital literacy encompasses using digital technologies to create, evaluate, and manage information. In English as a Foreign Language (EFL) education, digital literacy extends beyond mere proficiency in using computers or the internet; it involves the

critical navigation of digital tools, the analysis of language-related content, and the effective application of technology to enhance language learning experiences.

In light of the study's findings, one of the most promising pedagogical implications is developing an instructional model that integrates AI translation tools with proofreading applications. This model could be used to design curricula or specialized training programs for EFL educators and students in Thailand. Since English writing proficiency remains challenging for many EFL learners, particularly in non-native contexts like Thailand, integrating AI tools offers a potential breakthrough in improving writing skills. The instructional model derived from this study could serve as an alternative instructional framework that helps students engage with technology while still emphasizing the critical role of revision and language learning skills, in addition, EFL educators could apply the instructional model with the other productive skill as speaking. As technology progressively transforms education, combining AI speaking tools with proofreading software presents a complex yet promising strategy to improve EFL teaching.

Enhancing Language Awareness: Pedagogical Translanguaging

In multilingual learning environments, pedagogical translanguaging has become increasingly significant in fostering language awareness among EFL learners. Translanguaging, which entails the strategic use of multiple languages during instruction, enables students to leverage their linguistic repertoire to enhance learning, communication, and critical thinking. In Thai upper secondary EFL classrooms, where students often face challenges transitioning from Thai (L1) to English (L2), pedagogical translanguaging can effectively bridge language gaps, boost cognitive engagement, and improve English proficiency. The findings of this study, which highlight the training of Grammarly use of Grammarly, further underscore the necessity of incorporating translanguaging strategies into EFL instruction to foster deeper language awareness.

Sequences of Teacher-Student Interaction

During the Instructional Periods Using English and Thai

1st turn: The teacher asked two questions about the content of the previous lesson on the types of translation errors. The questions were in English, and the students answered them in English.

2nd turn: The teacher gave feedback in English and asked another question about the first type of translation error: punctuation and its descriptions in English. The students answered in English.

3rd turn: The teacher gave feedback in English, asked students if they remembered how to use punctuation in Thai, and then asked in Thai. Many students answered in Thai.

4th turn: The teacher gave feedback in Thai and asked a question about examples of punctuation use in English. Many students answered in English.

5th turn: In the last turn, the teacher used Thai to give feedback to the students and to explain all the examples of punctuation use the students mentioned.

These sequences indicate that the switching occurs only when directed by the teacher and must be justified because it serves a specific purpose. The language switching happens at the sentence level and is distinct from the cognitive engagement involved in translanguaging. Williams (2002) discusses this cognitive engagement by describing the process of translanguaging. In this process, students interpret input in one language and then translate the message or concept into another language, often enhancing and expanding the message in their output. According to Baker & Wright (2017), translanguaging is “the process of making meaning, shaping experiences, understandings and knowledge through the use of two languages.”

Pedagogical translanguaging takes as its basis a focus on multilingualism. This is an approach for teaching and research in multilingual education which is an alternative to traditional perspectives that emphasise language separation. The focus on multilingualism has three dimensions: 1) the multilingual speaker, 2) the multilingual repertoire, and 3) the social context.

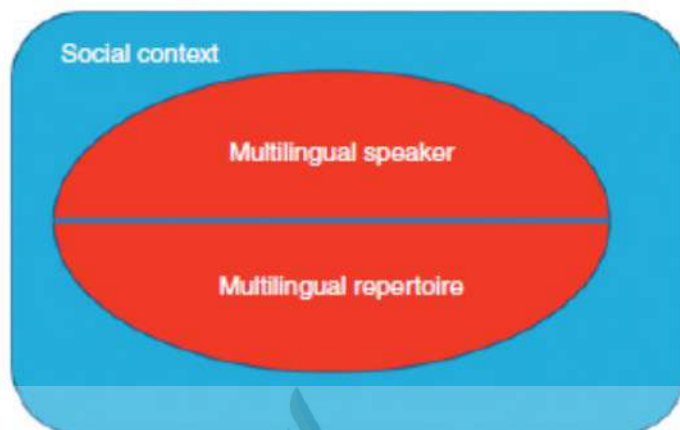


Figure 5.1 Three Dimensions of Focus on Multilingualism

Source: Cenoz & Gorter, 2021

A multilingual speaker uses their language skills based on their experiences and communication needs, challenging traditional monolingual perspectives. Their multilingual repertoire continuously exchanges, allowing them to apply skills across different languages. The language use is influenced by the social context, including social attitudes and policies. This context can create opportunities or barriers for multilingualism, affecting how languages develop and are used. (Cenoz & Gorter, 2021)

In the context of language learning and multilingual education, a critical role of EFL educators in translanguage in different settings is to scaffold or help students smoothly transition to using the majority and minority languages at school, and put the translanguaging into practical terms. Pedagogical translanguaging embraces different pedagogical practices. The researcher shall select one approach that utilizes resources from the students' complete linguistic repertoire and is designed by the teacher with an educational aim in this study. The full linguistic repertoire acts as a powerful method of pedagogical translanguaging, allowing the incorporation of two or more languages in classroom activities. Students are encouraged to tap into their multilingual abilities for significant learning experiences in various ways and naturally switch languages for input and output. (Cenoz & Gorter, 2021)

Addressing the Over-Reliance on AI Translation in EFL Learning

Addressing over-reliance on machine translation (MT) requires a pedagogical approach that balances technology use with active language engagement. While tools like Google Translate with Grammarly provide valuable support in writing, students must be trained to use them as learning aids rather than substitutes for critical thinking and language development. EFL educators should implement guided AI-assisted writing exercises where students analyze, compare, and correct AI-generated translations rather than passively accepting them. Teaching machine translation post-editing (MT-PE) strategies, such as the instructional periods in this study, encourages students to identify grammatical, syntactic, and contextual errors, fostering deeper language awareness and independent editing skills. Additionally, integrating contrastive analysis activities where students compare human translation versus AI-generated text helps them recognize linguistic nuances and structural differences between their first language (L1) and English (L2). For instance, EFL teachers promote peer-editing workshops and reflective writing tasks, encouraging students to engage with the language organically while using AI tools responsibly. By embedding critical digital literacy into EFL curricula, students can develop autonomy, improve writing accuracy, and reduce over-dependence on machine translation, ensuring that AI complements rather than replaces their language learning process.

5.4 LIMITATIONS

While this study has provided significant insights into the effectiveness of these AI-assisted tools for enhancing English writing ability among Thai upper secondary students, it is essential to acknowledge its limitations. No research study is without constraints, and recognizing these limitations adds credibility to the findings. The primary limitations of this study include the small sample sizes, loss of instructional time with technology, and the limitations of AI tools.

Limited Generalizability due to Small Sample Sizes

The researcher had planned to collect data with 30 English-majored students and had discussed the authorization with the school's head English teacher. Nevertheless, many students were no-shows. Consequently, the research was conducted with only 18 Thai upper secondary students, limiting the findings' generalizability to a broader population of EFL learners. While the study provides valuable insights into how AI-assisted tools impact writing skills, the results may not necessarily reflect students' experiences from different educational backgrounds, regions, or proficiency levels. EFL learners in rural schools, international schools, or universities may interact with AI tools differently, making it necessary for future research to include more significant and diverse participant groups. A more extensive study with a representative sample across multiple institutions would better understand how AI tools influence EFL writing development at various educational levels.

Loss of Time due to Technology Integration in the Pilot Test

One notable limitation of this study, mainly observed during the pilot test phase in Chapter 3, was the lack of instructional time due to integrating technology-based devices. Their use required significant time for setup, familiarization, troubleshooting, and practical application, reducing the overall instructional period available for direct language instruction and writing practice. Many students faced technical challenges, such as slow internet connections, difficulty navigating AI-generated feedback, and revising their work based on Grammarly's suggestions, due to troubleshooting and outdated versions of computers, tablets, and mobile devices, which extended lesson durations beyond the planned schedule. The time-consuming nature of technology-based learning raises concerns about classroom efficiency.

Educators must implement structured preparation strategies that streamline technology use in EFL classrooms. Pre-class technology setup can be optimized by ensuring students have pre-installed applications, stable internet access, and clear login instructions before instructional periods begin, at least 2-4 hours required. To address

familiarization issues, teachers can conduct introductory orientation sessions that include hands-on practice, interactive demonstrations, and guided tutorials on how to use AI tools effectively. Providing quick-reference guides or step-by-step video tutorials can also empower students to navigate these tools independently, reducing time spent on in-class explanations. Additionally, educators should anticipate common technical issues and offer a troubleshooting protocol to minimize troubleshooting delays. Educators can maximize instructional time by implementing a well-organized, time-efficient framework while effectively integrating AI tools into EFL writing development.

AI Tools' Inability to Capture Context and Creativity

While Google Translate with Grammarly offers powerful AI-driven support, it has flaws. This study did not critically analyze idiomatic expressions and cultural nuances that do not have direct translations, context-dependent word meanings, leading to misinterpretation or ambiguity, and creativity in writing, as AI-generated corrections often favor standardized structures, limiting students' ability to develop their unique writing style. EFL teachers can enhance the effectiveness and precision of translations and grammar corrections generated by AI, which may sometimes include awkward phrasing or contextually unsuitable word selections. However, tools like Grammarly still offer features to improve word choice and address this problem.

5.5 RECOMMENDATIONS FOR FURTHER RESEARCH

While this study has explored the impact of these AI-assisted tools on Thai upper secondary students' writing ability, there remains a vast area for further research. As AI continues to evolve and influence education, it is essential to investigate long-term learning effects, the adaptability of AI-driven instruction across diverse linguistic and educational contexts, the role of AI in enhancing other English skills in EFL Learning, and the ethical implications of AI reliance.

Longitudinal Studies on the Impact of AI-Assisted Writing in EFL Learning

A critical next step in research is to conduct longitudinal studies that examine the long-term effects of AI-assisted writing tools on EFL learners' language development. While this study has provided insights into the short-term improvements in writing ability, it remains unclear whether reliance on Google Translate with Grammarly leads to sustained improvement in grammar, vocabulary retention, and overall writing fluency. Future research should explore how students' language accuracy and fluency evolve after continued exposure to AI-assisted writing tools, whether students develop greater linguistic independence or become overly dependent on AI corrections, and the extent to which AI-assisted writing influences students' academic performance and test results, such as standardized English exams (e.g., IELTS, TOEFL).

Comparative Studies on AI-Assisted Learning across Different EFL Contexts

This study has focused on Thai upper secondary students, but EFL learners worldwide use AI translation and grammar-checking tools differently. A comparative study across various linguistic backgrounds would provide valuable insights into how different language structures influence AI-generated errors and corrections, whether EFL learners from non-Thai L1 backgrounds experience similar challenges when using machine translation tools, and how educational policies on AI tool usage differ across countries and impact learning outcomes.

For example, a comparative study between Thai and Japanese EFL students might reveal distinct difficulties in sentence structure, word choice, or grammar that AI tools struggle to address. Additionally, research could examine how students from different cultural backgrounds perceive AI feedback, whether as a supportive learning aid or a substitute for teacher feedback. Understanding these differences would allow educators to develop localized strategies for integrating AI into EFL curricula.

Role of AI in Enhancing Listening and Speaking Skills in EFL Learning

Most research on AI-assisted learning focuses on reading and writing skills, but little is known about its impact on speaking and listening proficiency. Since EFL learners must develop well-rounded communication skills, further research should explore the effectiveness of AI speech recognition tools (e.g., Google Translate's voice feature) in developing speaking accuracy and pronunciation or the potential of AI chatbots and conversational AI (e.g., ChatGPT, Duolingo) to enhance real-time communication skills.

Ethical Considerations and Academic Integrity in AI-Assisted EFL Learning

This further research gap becomes challenging for the researcher. With the growing use of AI in education, ethical concerns such as plagiarism, over-reliance, and authenticity of student work must be explored. Future studies should investigate whether students using Google Translate with Grammarly for academic writing engage in unintentional plagiarism due to AI-generated sentence restructuring or how institutions and educators should develop ethical guidelines for AI use in EFL learning.

This study has provided valuable insights into the short-term benefits of Google Translate with Grammarly for Thai EFL students. Still, a pressing need remains for further research on its long-term impact, cross-cultural implications, and ethical considerations. Future studies should explore how AI influences language learning beyond writing skills and address ethical concerns surrounding AI reliance. By continuing to examine the evolving role of AI in EFL education, researchers and educators can ensure that technology enhances rather than replaces the core principles of language learning, fostering linguistic independence, critical thinking, and long-term proficiency among students worldwide.

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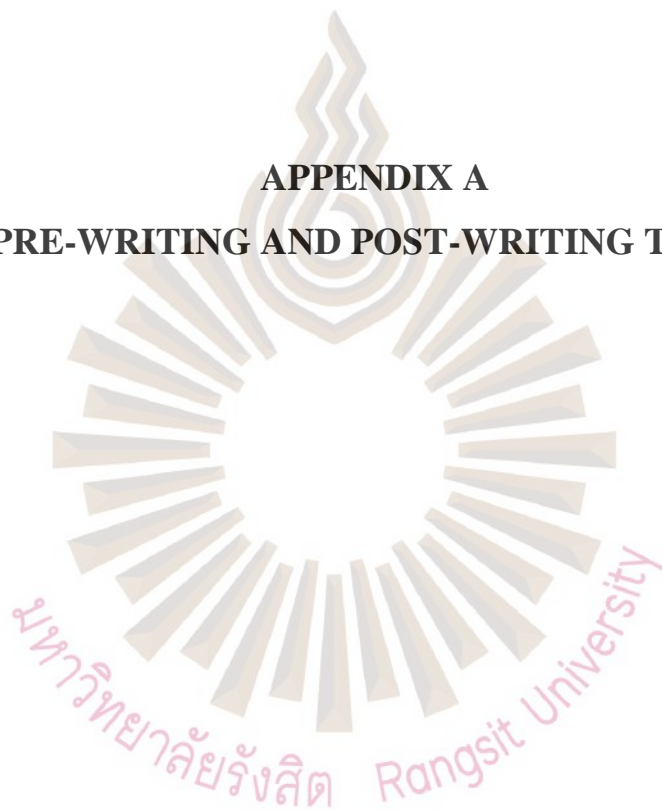
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APPENDICES



APPENDIX A
PRE-WRITING AND POST-WRITING TESTS



A. Purposes and Attitudes in Using GT

Adapted from Sukkhwan A. (2014) & Chompurach W. (2021)

This questionnaire , which contains five sections, is tailored to investigate the purposes and attitudes of upper secondary students at the Northern Thai Government School regarding using Google Translate (GT) for English language learning in the 2023 academic year.

Part 1	General information
Part 2	Purposes and frequency of GT use
Part 3	Attitudes towards using GT
Part 4	General comments about GT
Part 5	Problems found when using GT and solutions

Instructions: Please tick in the boxes, and tables or give written answers.

Part 1 General information

- Sex: male female
- Major:
- Do you like learning English? yes no
- Do you use Google Translate (GT)?
 yes no
- Do you use other machine translation?
 yes (please specify) no

Part 2 Purposes and Frequency of GT Use

No.	Purposes	Frequency (Times per week)				
		5	4	3	2	1
		Always	Often	Sometimes	Seldom	Never
6.	How often do you use GT? Times per week (Specify)					
7.	READING SKILL					
	7.1. Novels and Tales					
	7.2. Magazines					
	7.3. English News					
	7.4. Product labels					
	7.5. Advertisements					
	7.6. Signs					
	7.7. Epigrams and Proverbs					
	7.8. Texts on websites					
	7.9. Texts in an English textbook					
	7.10. Others..... (Specify)					
8.	WRITING SKILL					
	8.1. English poems or English cards					
	8.2. English emails					
	8.3. English sentences or texts in exercises or assignments in an English course					
	8.4. English words. Messages, or comments on social media e.g. Facebook, Twitter, Instagram					
	8.5. Live chat on a social network					

No.	Purposes	Frequency (Times per week)				
		5	4	3	2	1
		Always	Often	Sometimes	Seldom	Never
	8.6. Others..... (Specify)					
9.	VOCABULARY LEARNING					
	9.1. General words					
	9.2. Technical terms					
	9.3. Names of places or institutes					
	9.4. Part of Speech					
	9.5. Others..... (Specify)					
10.	TRANSLATION					
	10.1. Academic passages or articles					
	10.2. External reading books					
	10.3. Official documents					
	10.4. Idioms or proverbs					
	10.5. Others..... (Specify)					

Part 3 Attitudes towards GT Use

No.	Attitudes	Scale				
		5	4	3	2	1
		Strongly Agree	Agree	Fairly Agree	Disagree	Strongly Disagree
11.	GT gives me more advantages than disadvantages.					
12.	GT is free and easy to access.					
13.	GT can translate texts quickly.					
14.	The quality of texts translated by GT is better than by my translation.					
15.	I can rely on the accuracy of texts translated by GT (English to Thai translation).					
16.	I can rely on the accuracy of texts translated by GT (Thai to English translation).					
17.	I gain a lot of vocabulary knowledge when I use GT.					
18.	I learned English grammar and structure using GT.					
19.	I understand an English passage better with the assistance of GT.					
20.	Using GT, I do not need to remember new vocabulary or guess the meanings of words.					
21.	I feel more confident when using GT for English writing.					

No.	Attitudes	Scale				
		5	4	3	2	1
		Strongly Agree	Agree	Fairly Agree	Disagree	Strongly Disagree
22.	I can write English sentences better with the assistance of GT.					
23.	GT makes me lazy when thinking and using my effort to read.					
24.	GT makes me lazy when thinking and using my effort in writing.					
25.	I gain translation skills by using GT.					
26.	GT is more helpful and effective for students with low English than those with high English competency.					
27.	GT is equally helpful and effective for both students with low and high English competency.					
28.	Students with lower English proficiency depend more on GT in learning English than students with average or high proficiency.					

Part 4 General comments about GT**Advantages**

- 1.....
- 2.....
- 3.....
- 4.....

Disadvantages

- 1.....
- 2.....
- 3.....
- 4.....

Part 5 Writing errors found when using GT and solutions.

- 1.....
- Solutions.....
- 2.....
- Solutions.....
- 3.....
- Solutions.....
- 4.....
- Solutions.....

B. Students' Perception of Using Grammarly Questionnaire

Adapted from O'neill & Russell (2019) and Rejeki S. (2023)

This students' perception of using Grammarly Application form is designed to determine the behaviors of Grammarly use among Upper Secondary students at the Northern Thai government school for the 2023 academic year. The form consists of two sections.

- | | |
|--------|--|
| Part 1 | General information about Grammarly |
| Part 2 | Indicators: Reasons for using Grammarly, usage of Grammarly, And Strengths and Weaknesses of Grammarly |

Part 1 General information about Grammarly

1. Sex: male female
2. Major:
3. Do you use Grammarly in English Writing? yes no
4. What type of Grammarly application that you use? Free Premium
5. When do you use Grammarly in your English writing?

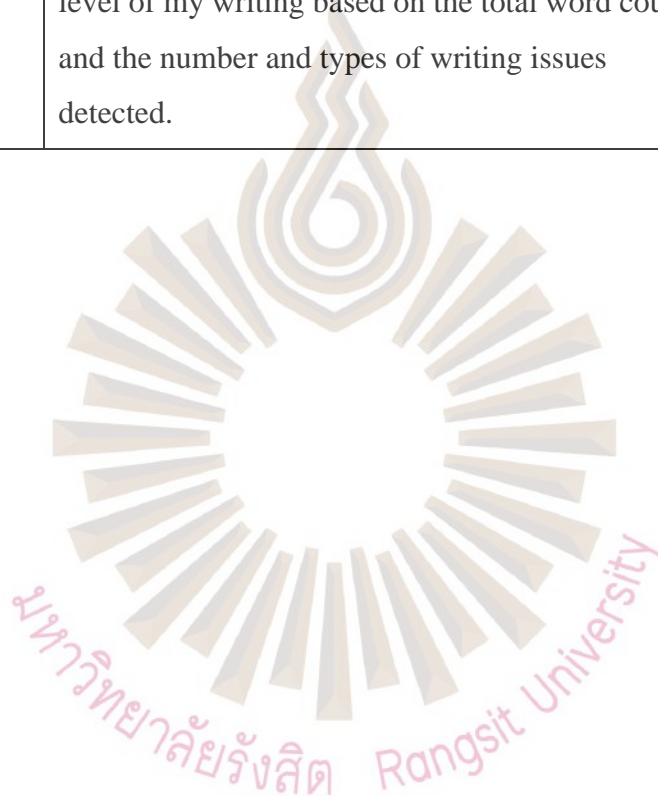
<input type="checkbox"/> Before joining this orientation	<input type="checkbox"/> After joining this orientation
--	---
6. What do you usually focus on while using Grammarly?

<input type="checkbox"/> Grammar checking	<input checked="" type="checkbox"/> Spelling checking
<input type="checkbox"/> Punctuation checking	<input type="checkbox"/> Plagiarism checking
<input type="checkbox"/> Clarity checking	

Part 2 Rating Statements: Reasons for using Grammarly, usage of Grammarly, and Strengths and Weaknesses of Grammarly

Indicators	Statements	Yes	No
Reasons for using Grammarly	2.1. I used Grammarly to complement my teacher's feedback.		
	2.2. I started using Grammarly because of the recommendation from my teacher.		
	2.3. The grammar feedback made me feel more confident about submitting my assignment.		
	2.4. I am motivated when the teacher appreciates my English writing performance as a result of using Grammarly.		
	2.5. Grammarly can minimize the writing errors in my English writing.		
Usage of Grammarly	2.6. Receiving grammar feedback on my assignment was important to me.		
	2.7. The grammar feedback focused on my major errors.		
	2.8. Sometimes, I ignore certain suggestions from Grammarly.		
	2.9. The errors were easy to understand because the explanations were clear.		
	2.10. Grammarly's feedback improved my language skills over the long term, as it helped me better understand grammatical rules.		
	2.11. I received a lot of useful suggestions on how to improve my grammar by using Grammarly.		
	2.12. I prefer feedback from lecturers over Grammarly.		

Indicators	Statements	Yes	No
Strengths and Weaknesses of Grammarly	2.13. Grammarly encourages me to do independent proofread independently.		
Grammarly	2.14. I found some of Grammarly's feedback to be inaccurate.		
	2.15. Grammarly provides me with a performance score that measures the accuracy level of my writing based on the total word count and the number and types of writing issues detected.		



C. Examples of 8 Clippings and Errors Tested in Thai-English Translation Jamjuree Journal, 2020

1. The Article Clipping I



ในโลกของอนาคตซึ่งจะทดแทนการทำงานของ 4G ด้วย 5G ตัวเซ็นเซอร์นี้ ควรจะสามารถเคลื่อนไหวได้ง่ายด้วย กรณีนี้ AIS เป็นผู้ตั้งประเด็นขึ้น โดยคณาจารย์ได้ทำหน้าที่วิจัย ทดลองเปลี่ยนจาก NB-IoT สำหรับวัดค่า PM 2.5 ที่ติดตั้งตามเสาไฟติดที่ CU Pop Bus ทำให้แทนที่เราจะต้อง Deploy ตามจุดต่างๆ ซึ่งต้องใช้นับพันตัว ตัวเซ็นเซอร์นี้จะเคลื่อนที่ไปเรื่อยๆ ในพื้นที่ของมหาวิทยาลัย ตามการเคลื่อนที่ของรถป๊อปบัส ไอเดียนี้ทำให้เราขยายมุมมองให้เห็นภาพในอนาคตที่ว่า หุ่นยนต์ จะเป็น Swarm Robot หรือหุ่นยนต์ธรรมดา จะเคลื่อนไปสู่ Cloud Robot ซึ่งจะต้องมีการสื่อสารระหว่างกัน (Peer-to-peer communication) และระหว่างหุ่นยนต์กับ Server ซึ่งจะเห็นได้ว่านี่คือตัวอย่างของ ลักษณะการ Uplink ของ Data ที่จะมามากยิ่งขึ้น ในอนาคต

หน้า 24

อัศววิเศษ, วิทยากร (2020), 5G กับการเปลี่ยน Key Players ใน โลก ศูนย์ทดสอบ 5G แห่ง จุฬาลงกรณ์มหาวิทยาลัย, Jamjuree Journal: Vol. 22: Iss. 3, Article 4, Page 3

ในโลกของอนาคตซึ่งจะทดแทนการทำงานของ 4G ด้วย 5G ตัวเซ็นเซอร์นี้ ควรจะสามารถเคลื่อนไหวได้ง่ายด้วย กรณีนี้ AIS เป็นผู้ตั้งประเด็นขึ้น โดยคณาจารย์ได้ทำหน้าที่วิจัย ทดลองเปลี่ยนจาก NB-IoT สำหรับวัดค่า PM 2.5 ที่ติดตั้งตามเสาไฟติดที่ CU Pop Bus ทำให้แทนที่เราจะต้อง Deploy ตามจุดต่างๆ ซึ่งต้องใช้นับพันตัว ตัวเซ็นเซอร์นี้จะเคลื่อนที่ไปเรื่อยๆ ในพื้นที่ของมหาวิทยาลัย ตามการเคลื่อนที่ของรถป๊อปบัส ไอเดียนี้ทำให้เราขยายมุมมองให้เห็นภาพในอนาคตที่ว่า หุ่นยนต์ จะเป็น Swarm Robot หรือหุ่นยนต์ธรรมดา จะเคลื่อนไปสู่ Cloud Robot ซึ่งจะต้องมีการสื่อสารระหว่างกัน (Peer-to-peer communication) และระหว่างหุ่นยนต์กับ Server ซึ่งจะเห็นได้ว่านี่คือตัวอย่างของ ลักษณะการ Uplink ของ Data ที่จะมามากยิ่งขึ้น ในอนาคต

1.1 Translated text by Google Translate via Google Lens

In the future world that will replace the operation of 4G with 5G, this sensor should be able to move easily. In this case, AIS raised the issue. The lecturers have done research and experimented to change from NB-IoT for measuring PM 2.5 installed on

the pole to be installed at CU Pop Bus. So instead of having to deploy at various points, which requires thousands of units, this sensor will move continuously in the university area, following the movement of the Pop Bus. This idea allows us to expand our perspective to see the future that robots will be Swarm Robots or ordinary robots will move to Cloud Robots, which will require peer-to-peer communication and between robots and servers. It can be seen that this is an example of the Uplink data characteristics that will increase more and more in the future.

1.2 Grammarly correctness and rephrasing

In the future world that will replace the operation of 4G with 5G, this sensor should be able to move easily. In this case, AIS raised the issue. The lecturers have done research and experimented to change from NB-IoT for measuring PM 2.5 installed on the pole to be installed at CU Pop Bus. So instead of having to deploy at various points, which requires thousands of units, this sensor will move continuously in the university area, following the movement of the Pop Bus. This idea allows us to expand our perspective to see the future that robots will be Swarm Robots or ordinary robots will move to Cloud Robots, which will require peer-to-peer communication and between robots and servers. It can be seen that this is an example of the Uplink data characteristics that will increase more and more in the future.

Detected translation errors in round #1

Correctness Errors (Red underlines): Verb Form, Preposition, Punctuation

Clarity Errors (Blue underlines): None

Engagement Errors (Green underlines): Word Choice

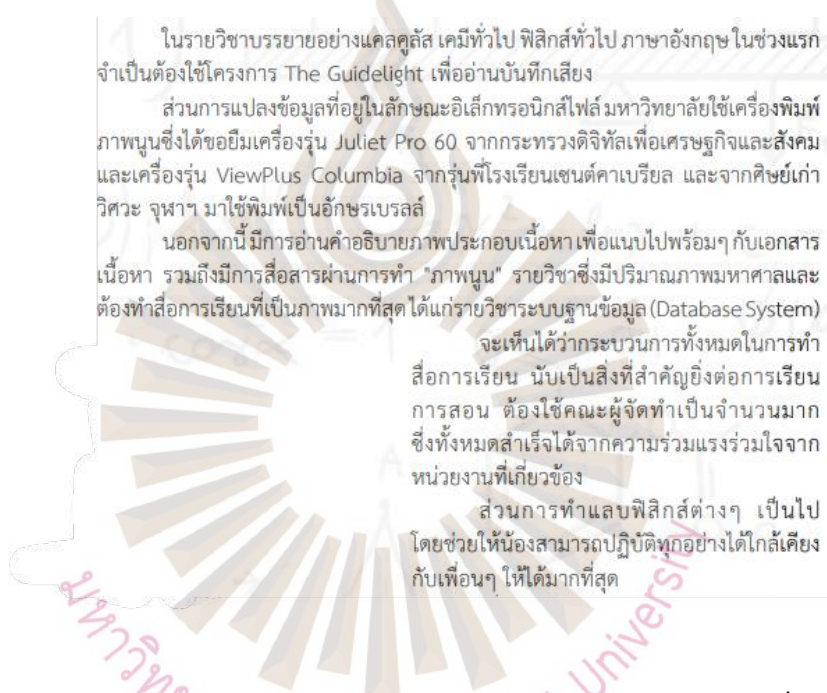
Delivery Errors (Purple underlines): None

1.3 Final Grammarly post-edited outputs

In the future, when the operation of 4G is replaced with 5G, this sensor should be able to move quickly. In this case, AIS raised the issue. The lecturers have done research and experimented with changing from NB-IoT to measure PM 2.5 installed on the pole to be installed at CU Pop Bus. So, instead of having to deploy at various points,

which requires thousands of units, this sensor will move continuously in the university area, following the movement of the Pop Bus. This idea allows us to expand our perspective to see the future that robots will be Swarm Robots or ordinary robots will move to Cloud Robots, which will require peer-to-peer communication between robots and servers. It can be seen that this is an example of the Uplink data characteristics that will increase more and more in the future.

2. The Article Clipping #2



บุญยพุกกณะ, โปธกษราน (2020), "มองผ่านมุมมอง" นวัตกรรมทางการเห็น" การเรียนการสอนด้วย Assistive Technology ในจุฬาฯ, Jamjuree Journal: Vol. 22: Iss. 3, Article 10, Page 60.

ในรายวิชาบรรยายอย่างแคลคูลัส เคมีทั่วไป ฟิสิกส์ทั่วไป ภาษาอังกฤษ ในช่วงแรก จำเป็นต้องใช้โครงการ The Guidelight เพื่ออ่านบันทึกเสียง ส่วนการแปลงข้อมูลที่อยู่ในลักษณะ อิเล็กทรอนิกส์ไฟล์ มหาวิทยาลัยใช้เครื่องพิมพ์ ภาพนูนซึ่งได้ขอยืมเครื่องรุ่น Juliet Pro 60 จาก กระทรวงดิจิทัลเพื่อเศรษฐกิจและสังคม และเครื่องรุ่น ViewPlus Columbia จากรุ่นพี่โรงเรียนเซนต์ คาเบรียล และจากศิษย์เก่าวิศวฯ จุฬาฯ มาใช้พิมพ์เป็นอักษรเบรลล์ นอกจากนี้ มีการอ่านคำอธิบาย ภาพประกอบเนื้อหาเพื่อแนบไปพร้อมๆ กับเอกสาร เนื้อหา รวมถึงมีการสื่อสารผ่านการทำ "ภาพ นูน" รายวิชาซึ่งมีปริมาณภาพมหาศาลและต้องทำสื่อการเรียนที่เป็นภาพมากที่สุดได้แก่รายวิชา ระบบฐานข้อมูล (Database System) จะเห็นได้ว่ากระบวนการทั้งหมดในการทำ สื่อการเรียน

นับเป็นสิ่งที่สำคัญยิ่งต่อการเรียน การสอน ต้องใช้คณะผู้จัดทำเป็นจำนวนมาก ซึ่งทั้งหมดสำเร็จได้จากความร่วมมือร่วมใจจาก หน่วยงานที่เกี่ยวข้อง ส่วนการทำแลปฟิสิกส์ต่างๆ เป็นไป โดยช่วยให้น้องสามารถปฏิบัติทุกอย่างได้ใกล้เคียง กับเพื่อนๆ ให้ได้มากที่สุด

2.1 Translated text by Google Translate via Google Lens

In early lecture courses such as Calculus, General Chemistry, General Physics, and English, The Guidelight project was required to read audio recordings.

For the conversion of data in electronic file format, the university uses a embossing printer, which was borrowed from the Ministry of Digital Economy and Society, and a ViewPlus Columbia printer from a senior of St. Gabriel's School and an alumnus of Chulalongkorn University's Engineering Faculty, to print in Braille.

In addition, there is a reading of the content descriptions attached to the documents. The content, including communication through the creation of "relief images", the subject that has a large amount of images and requires the most visual learning media is the subject of Database System.

It can be seen that the entire process of making learning media is very important for teaching and learning. It requires a large team of people to make it, and all of this is accomplished through the cooperation of relevant agencies.

As for the physics lab, it is done in a way that helps students practice everything as closely as possible to their friends.

2.2 Grammarly correctness and rephrasing round #1

In early lecture courses such as Calculus, General Chemistry, General Physics, and English, The Guidelight project was required to read audio recordings.

For the conversion of data in electronic file format, the university uses a embossing printer, which was borrowed from the Ministry of Digital Economy and Society, and a ViewPlus Columbia printer from a senior of St. Gabriel's School and an alumnus of Chulalongkorn University's Engineering Faculty, to print in Braille.

In addition, there is a reading of the content descriptions attached to the documents. The content, including communication through the creation of "relief images", the subject that has a large amount of images and requires the most visual learning media is the subject of Database System.

It can be seen that the entire process of making learning media is very important for teaching and learning. It requires a large team of people to make it, and all of this is accomplished through the cooperation of relevant agencies.

As for the physics lab, it is done in a way that helps students practice everything as closely as possible to their friends.

Detected translation errors in round #1

Correctness Errors (Red underlines): Determiners, Punctuation, Verb Form, Proposition

Clarity Errors (Blue underlines): Wordy/Unclear

Engagement Errors (Green underlines): Word Choice

Delivery Errors (Purple underlines): None

2.3 Final Grammarly post-edited outputs

The Guidelight project was required to read audio recordings in early lecture courses such as Calculus, General Chemistry, General Physics, and English.

For converting data into electronic file format, the university uses an embossing printer borrowed from the Ministry of Digital Economy and Society and a ViewPlus

Columbia printer from a senior of St. Gabriel's School and an alumnus of Chulalongkorn University's Engineering Faculty to print in Braille.

In addition, a reading of the content descriptions is attached to the documents. The content, including communication through the creation of "relief images," the subject that has a large number of images and requires the most visual learning media, is the subject of the Database System.

The entire process of making learning media is very important for teaching and learning. It requires a large team of people to make it, which is accomplished through the cooperation of relevant agencies.

As for the physics lab is done in a way that helps students practice everything as closely as possible to their friends.

3.The Article Clipping #3

ถ้าเมืองดี

เมื่อคนเข้ามาอยู่ในเมืองอะจะขึ้นจะกลายเป็นพร
อันประเสริฐหรือจะเป็นค่าสถาปเงินอยู่กับว่าเราจะสามารถ
จัดการทรัพยากรอย่างไร ไม่ว่าจะทรัพยากรแรงงาน หรือ
ความคิดสร้างสรรค์ ฯลฯ เมืองที่ดีมันต้องมีจำนวนคน
หนาแน่น ก็สามารถจัดการให้ทุกอย่างอยู่ร่วมกันได้ ทั้งเรื่อง
การเดินทาง ระบบขนส่งสาธารณะที่ดี การเชื่อมต่อพื้นที่ชุมชน
ทั้งเมือง เมื่อออกจากขนส่งสาธารณะก็มีทางเดินเท้าทางจักรยาน
ที่ดี และเดินไปด้วยพื้นที่สีเขียว

เมืองที่ดี จะต้องมีการจัดเตรียมสถานที่ที่เป็น
สาธารณูปโภค (Urban Facilities) ต่างๆ อย่างห้องสมุด
สนามกีฬา พื้นที่ตลาด สวนสาธารณะ ให้มีครบถ้วนต่างๆ
ในเมืองได้อย่างทั่วถึงและเห็นได้ชัด เมืองในระเทศยุโรป เช่น
ฝรั่งเศส ห้างสรรพสินค้าปิดในวันอาทิตย์ ในพื้นที่สวนสาธารณะ
ที่สวนรวมกระจ่ายอยู่ทุกที่ มีพิพิธภัณฑ์จัดแสดงงานศิลปะ
ชั้นเลิศที่เด็กและผู้สูงอายุสามารถจะเข้าได้ด้วยราคาที่ถูก
มีโรงภาพยนตร์ สวนที่ปิคนิค หรือสถานที่เดินเล่นริมน้ำ
ที่ออกแบบไว้อย่างสวยงาม เหล่านี้เป็นความสุขที่เข้าถึงได้
โดยแทบไม่ต้องใช้เงินเยอะหรือใช้เงินน้อยมาก ปีคือการเข้าถึง
ความสุขได้อย่างเท่าเทียม หากเมืองดี ก็จะทำให้ประชากรและ
คนส่วนใหญ่ที่อยู่ในเมืองเข้าถึงความสุขได้มากขึ้น



เสรีสกุล, นิรมล (2020), ลดความเหลื่อมล้ำด้วยการออกแบบเมือง ศูนย์ออกแบบและ
พัฒนาเมือง (UddC) จุฬาลงกรณ์มหาวิทยาลัย, Jamjuree Journal: Vol. 22: Iss. 3, Article 6, Page 4.

ถ้าเมืองดี

เมื่อคนเข้ามาอยู่ในเมืองเยอะขึ้นจะกลายเป็นพรอันประเสริฐหรือจะเป็นคำสาปขึ้นอยู่กับว่าเราจะสามารถจัดการทรัพยากรอย่างไร ไม่ว่าจะทรัพยากรแรงงานหรือความคิดสร้างสรรค์ ฯลฯ เมืองที่จัดการได้คือนั้น แม้ว่าจำนวนคนหนาแน่น ก็สามารถจัดการให้ทุกสิ่งทุกอย่างอยู่ร่วมกันได้ ทั้งเรื่องการเดินทาง ระบบขนส่งสาธารณะที่ดี การเชื่อมต่อพื้นที่ชุมชน ทั้งเมือง เมื่อออกจากขนส่งสาธารณะก็มีทางเดินเท้า ทางจักรยานที่ดี และเต็มไปด้วยพื้นที่สีเขียว เมืองที่ดี จะต้องมีการจัดเตรียมสถานที่ที่เป็นสาธารณูปการ (Urban Facilities) ต่างๆ อย่างห้องสมุด สนามกีฬา พื้นที่ตลาดสวนสาธารณะ ให้กับคนกลุ่มต่างๆ ในเมืองได้อย่างทั่วถึงและเท่าเทียม เมืองในประเศยุโรป เช่น ฝรั่งเศส ห้างสรรพสินค้าปิดในวันอาทิตย์ แต่มีสวนสาธารณะที่สวยงามกระจายอยู่ทุกที่ มีพิพิธภัณฑ์ จัดแสดงงานศิลปะชั้นเลิศที่เด็กและผู้สูงอายุสามารถจะเข้าได้ด้วยราคาที่ถูก มีโรงพยาบาล สถานที่พักนิก หรือสถานที่เดินเล่นริมแม่น้ำ ที่ออกแบบไว้อย่างสวยงาม เหล่านี้เป็นความสุขที่เข้าถึงได้ โดยแทบไม่ต้องใช้เงินเลยหรือใช้เงินน้อยมาก นี่คือการเข้าถึง ความสุขได้อย่างเท่าเทียม หากเมืองดีก็จะทำให้ประชากรและคนส่วนใหญ่ที่อยู่ในเมืองเข้าถึงความสุขได้มากขึ้น

3.1 Translated text by Google Translate via Google Lens

If the city is good

When more people move into a city, it becomes a blessing or a curse depending on how we manage our resources, whether they are labor resources, creativity, etc. A well-managed city, despite its dense population, can manage everything to coexist, including transportation, good public transportation, connectivity of community areas, and when you get off public transportation, there are good footpaths, bicycle paths, and plenty of green space. A good city must provide various urban facilities such as libraries, sports fields, market areas, parks for all groups of people in the city equally and equally. In European cities, such as France, shopping malls are closed on Sundays, but there are beautiful parks everywhere. There are museums with excellent art that children and the elderly can enter at a low price. There are cinemas, picnic areas, or beautifully designed riverside walks. These are pleasures that are accessible to almost no money or very little money. This is equal access to happiness. If the city is good, it will allow the population and the majority of people living in the city to have more access to happiness

3.2 Grammatically correctness and rephrasing in round #1

If the city is good

When more people move into a city, it becomes a blessing or a curse [] depending on how we manage our resources, whether they are labor resources, creativity, etc. A well-managed city, despite its dense population, can manage everything to coexist, including transportation, good public transportation, [] connectivity of community areas, and when you get off public transportation, there are good footpaths, bicycle paths, and plenty of green space. A good city must provide various urban facilities such as libraries, sports fields, market areas, parks for all groups of people in the city equally and equally. In European cities, such as France, shopping malls are closed on Sundays, but there are beautiful parks everywhere. There are museums with excellent art that children and the elderly can enter at a low price. There are cinemas, picnic areas, or beautifully designed riverside walks. These are pleasures that are accessible to almost no money or very little money. This is equal access to happiness. If the city is good, it will allow the population and the majority of people living in the city to have more access to happiness.

Detected translation errors in round #1

Correctness Errors (Red underlines): Conjunction

Clarity Errors (Blue underlines): Wordy/Unclear, Reference

Engagement Errors (Green underlines): Word Choice

Delivery Errors (Purple underlines): Polite/Professional

3.3 Grammatically correctness and rephrasing in round #2

If the city is good

When more people move into a city, it becomes a blessing or a curse, depending on how we manage our resources, whether they are labor resources, creativity, etc. A well-managed city, despite its dense population, can manage everything to coexist,

including transportation. There is good public transportation and connections to community areas, and when you get off public transportation, there are good footpaths, bicycle paths, and plenty of green space.

A good city must provide various urban facilities such as libraries, sports fields, market areas, and parks for all groups of people in the town equally and equally. In European cities, such as France, shopping malls are closed on Sundays, but beautiful parks are everywhere. There are museums with excellent art that children and older people can enter cheaply. There are cinemas, picnic areas, and beautifully designed riverside walks. These pleasures are accessible to almost no money or very little money. This is equal access to happiness. If the city is good, it will allow the population and the majority of people living there to have more access to joy.

3.4 Translation Errors in Grammarly post-edited outputs

If the city is good

When more people move into a city, it becomes a blessing or a curse, depending on how we manage our resources, whether they are labor resources, creativity, etc. [A well-managed city](#), despite its dense population, can manage everything to coexist, including transportation. There is good public transportation and connections to community areas, and when you get off public [transportation](#), there are good footpaths, bicycle paths, and plenty of green space.

A good city must provide various urban facilities such as libraries, sports fields, market areas, and parks for all groups of people in the town equally and equally. In European cities, [such as](#) France, shopping malls are closed on Sundays, but beautiful parks are everywhere. There are museums with excellent art that children and older people can [enter](#) cheaply. There are cinemas, picnic areas, and beautifully designed riverside walks. These pleasures are accessible to almost no money or very little money. This is equal access to happiness. If the city is good, it will allow the population and the majority of people living there [to have](#) more access to joy.

Detected translation errors in round #2**Correctness Errors (Red underlines):** Verb Form**Clarity Errors (Blue underlines):** Wordy/Unclear**Engagement Errors (Green underlines):** Word Choice**Delivery Errors (Purple underlines):** None**3.5 Final Grammarly post-edited output**

If the city is good

When more people move into a city, it becomes a blessing or a curse, depending on how we manage our resources, whether they are labor resources, creativity, etc. Despite its dense population, a well-managed city can manage everything to coexist, including transportation. There is good public transportation and connections to community areas, and when you get off public transit, there are good footpaths, bicycle paths, and plenty of green space.

A good city must provide various urban facilities such as libraries, sports fields, market areas, and parks for all groups of people in the town equally and equally. In European cities like France, shopping malls are closed on Sundays, but beautiful parks are everywhere. There are museums with excellent art that children and older people can enjoy cheaply. There are cinemas, picnic areas, and beautifully designed riverside walks. These pleasures are accessible to almost no money or very little money. This is equal access to happiness. If the city is good, it will allow the population and the majority of people living there more access to joy.

D. Online Student's Thai-English Translation Worksheet

Name.....Grade.....

Online Student's Thai-English Translation Worksheet

Instructions: Complete this form with the 8 assigned clippings by following the instructions attached to each item. When you encounter translation errors in the text generated by Google Translate, indicate the type of error based on the table below. Use **red**, **blue**, **green**, and **purple** highlights, along with bold and underlined text, as indicated by Grammarly. Correct the translation errors in Grammarly's outputs as many rounds as needed until no errors remain.

Highlighted & Underlined Colors in Grammarly	<u>Red</u>	<u>Blue</u>	<u>Green</u>	<u>Purple</u>
Detected Translation Errors from Google Translate	Punctuation Preposition Determiners (Article) Verb Form Noun Agreement Pronoun Conjunction	Wordy/Unclear Reference	Word Choice	Polite/Professional

The Article Clipping # (Number 1-8)



1. Translated text by Google Translate via Google Lens

Instructions: Use your Google Translate application to translate Thai text into English using Google Lens. Copy and paste the English text below.

.....

.....

2. Grammarly correctness and rephrasing in round #1

Instructions: Complete this form with the 8 assigned clippings by following the instructions attached to each item. When you encounter translation errors in the text generated by Google Translate, indicate the type of error based on the table below. Use red, blue, green, and purple highlights, along with bold and underlined text, as indicated by Grammarly. Correct the translation errors in Grammarly's outputs as many rounds as needed until no errors remain.

.....

.....

Detected translation errors in round #1

Correctness Errors (Red underlines):

.....

Clarity Errors (Blue underlines):

.....

Engagement Errors (Green underlines):

.....

Delivery Errors (Purple underlines):

.....

3. Grammarly correctness and rephrasing in round #2

Instructions: Complete this form with the 8 assigned clippings by following the instructions attached to each item. When you encounter translation errors in the text generated by Google Translate, indicate the type of error based on the table below. Use red, blue, green, and purple highlights, along with bold and underlined text, as indicated by Grammarly. Correct the translation errors in Grammarly’s outputs as many rounds as needed until no errors remain.

.....

Detected translation errors in round #2

Correctness Errors (Red underlines):

.....

Clarity Errors (Blue underlines):

.....

Engagement Errors (Green underlines):

.....

Delivery Errors (Purple underlines):

.....

4. Final Grammarly post-edited outputs

Instructions: Paste the final Grammarly outputs from Item #3, which should all be correct. When the text is error-free, the Grammarly application will display a message such as "Great Job" or "Well Done!"

.....

E. Examples of 8 Thai Clippings for Online Student's Thai-English Translation Worksheet

The Article Clipping #1



ในโลกของอนาคตซึ่งจะทดแทนการทำงานของ 4G ด้วย 5G ตัวเซ็นเซอร์นี้ควรจะสามารถเคลื่อนไหวได้ง่ายด้วย กรณีนี้ AIS เป็นผู้ตั้งประเด็นขึ้น โดยคณาจารย์ได้ทำหน้าที่วิจัย ทดลองเปลี่ยนจาก NB-IoT สำหรับวัดค่า PM 2.5 ที่ติดตั้งตามเสาไฟติดที่ CU Pop Bus ทำให้แทนที่เราจะต้อง Deploy ตามจุดต่างๆ ซึ่งต้องใช้ต้นทุนตัวตัวเซ็นเซอร์ก็จะเคลื่อนที่ไปเรื่อยๆ ในพื้นที่ของมหาวิทยาลัย ตามการเคลื่อนที่ของรถบัส ไอเดียนี้ทำให้เราขยายมุมมองให้เห็นภาพในอนาคตที่ว่า หุ่นยนต์ จะเป็น Swarm Robot หรือหุ่นยนต์ธรรมดา จะเคลื่อนไปสู่ Cloud Robot ซึ่งจะต้องมีการสื่อสารระหว่างกัน (Peer-to-peer communication) และระหว่างหุ่นยนต์กับ Server ซึ่งจะเห็นได้ว่าเป็นตัวอย่างของลักษณะการ Uplink ของ Data ที่จะมีความยิ่งขึ้น ในอนาคต

หน้า 24

The Article Clipping #2

ในรายวิชาบรรยายอย่างแคลคูลัส เคมีทั่วไป ฟิสิกส์ทั่วไป ภาษาอังกฤษ ในช่วงแรกจำเป็นต้องใช้โครงการ The Guidelight เพื่ออ่านบันทึกเสียง

ส่วนการแปลงข้อมูลที่อยู่ในลักษณะอิเล็กทรอนิกส์ไฟล์มหาวิทยาลัยใช้เครื่องพิมพ์ภาพนูนซึ่งได้ขอยืมเครื่องรุ่น Juliet Pro 60 จากกระทรวงดิจิทัลเพื่อเศรษฐกิจและสังคม และเครื่องรุ่น ViewPlus Columbia จากรุ่นที่โรงเรียนเซนต์คาเบรียล และจากศิษย์เก่าวิศวะ จุฬาฯ มาใช้พิมพ์เป็นอักษรเบรลล์

นอกจากนี้มีการอ่านคำอธิบายภาพประกอบเนื้อหาเพื่อแนบไปพร้อมๆ กับเอกสารเนื้อหา รวมถึงมีการสื่อสารผ่านการทำ "ภาพนูน" รายวิชาซึ่งมีปริมาณภาพมหาศาลและต้องทำสื่อการเรียนที่เป็นภาพมากที่สุด ได้แก่รายวิชาระบบฐานข้อมูล (Database System)

จะเห็นได้ว่ากระบวนการทั้งหมดในการทำสื่อการเรียน นับเป็นสิ่งที่สำคัญยิ่งต่อการเรียนการสอน ต้องใช้คณะผู้จัดทำเป็นจำนวนมาก ซึ่งทั้งหมดสำเร็จได้จากความร่วมมือแรงร่วมใจจากหน่วยงานที่เกี่ยวข้อง

ส่วนการทำแลบฟิสิกส์ต่างๆ เป็นไปโดยช่วยให้น้องสามารถปฏิบัติทุกอย่างได้ใกล้เคียงกับเพื่อนๆ ให้ได้มากที่สุด

The Article Clipping #3

ถ้าเมืองดี

เมื่อคนเข้ามาอยู่ในเมืองเขอะขึ้นจะกลายเป็นพรอันประเสริฐหรือจะเป็นค่าเสียขึ้นอยู่กับว่าเราจะสามารถจัดการทรัพยากรอย่างไร ไม่ว่าจะทรัพยากรแรงงาน หรือความคิดสร้างสรรค์ ฯลฯ เมืองที่จัดการได้ดีนั้น แม้ว่าจำนวนคนหนาแน่น ก็สามารถจัดการให้ทุกสิ่งทุกอย่างอยู่ร่วมกันได้ ทั้งเรื่องการเดินทาง ระบบขนส่งสาธารณะที่ดี การเชื่อมต่อพื้นที่ชุมชนทั้งเมืองเมื่อออกจากขนส่งสาธารณะก็มีทางเดินเท้าทางจักรยานที่ดี และเต็มไปด้วยพื้นที่สีเขียว

เมืองที่ดี จะต้องมีการจัดเตรียมสถานที่ที่เป็นสาธารณูปการ (Urban Facilities) ต่างๆ อย่างห้องสมุด สนามกีฬา พื้นที่ตลาด สวนสาธารณะ ให้กับคนกลุ่มต่างๆ ในเมืองได้อย่างทั่วถึงและเท่าเทียม เมืองในประเทศยุโรป เช่น ฝรั่งเศส ห้างสรรพสินค้าปิดในวันอาทิตย์ แต่มีสวนสาธารณะที่สวยงามกระจายอยู่ทุกที่ มีพิพิธภัณฑ์จัดแสดงงานศิลปะ ชั้นเล็ทที่เด็กและผู้สูงอายุสามารถจะเข้าได้ด้วยวาทาที่อุกมีโรงภาพยนตร์ สถานที่ปิกนิก หรือสถานที่เดินเล่นวิ่งแรมน้ำที่ออกแบบไว้อย่างสวยงาม เหล่านี้เป็นความสุขที่เข้าถึงได้โดยแทบไม่ต้องใช้เงินเลยหรือใช้เงินน้อยมาก นี่คือการเข้าถึงความสุขได้อย่างเท่าเทียม หากเมืองดี ก็จะทำให้ประชากรและคนส่วนใหญ่ที่อยู่ในเมืองเข้าถึงความสุขได้มากขึ้น



E. Answer Sheet for scoring system

Clippings/ Type	Punctuation	Preposition	Determiners	Verb Form	Noun Agreement	Pronoun	Conjunction	Wardy/ Unclear	Reference	Word Choice	Polite/ Professional	Total
Clipping #1	1	1		1						1		4
Clipping #2	4	1	1	1				1		1		6
Clipping #3				1			1	2	1	2	1	8
Clipping #4	1	1		1			1	2	1			7
Clipping #5	1			1			1	2				4
Clipping #6	1			1	1		1	2	1	2		9
Clipping #7	1						1	1			1	4
Clipping #8	2		1			1		2	1	1		9

The image features a large, faint watermark of the Rangsit University logo in the background. The logo consists of a central flame-like symbol above a semi-circular arrangement of radiating lines, with the university's name in Thai and English below it.

APPENDIX B
INSTRUCTIONAL PERIODS IN TRAINING OF GOOGLE
TRANSLATE USE WITH GRAMMARLY

มหาวิทยาลัยรังสิต Rangsit University

**A. The First Instructional Period's lesson plan
(Google Translate Use with Grammarly Features)**

Goals and Objectives of Instructional Periods

Goals: At the end of the training, students will be able to render Thai sentences into English sentences using Google Translate and correctly post-edit those raw English outputs with Grammarly to develop their EFL writing assignments.

Standards and Indicators in Basic Education Core Curriculum B.E. 2551 (A.D., 2008)

Strand 2: Language and Culture

Standard F2.2: Understanding of the technology and technological processes; designing and making objects, utensils, or the methodologies through the creative technological processes; selective utilization of the technologies beneficial to one's life, society and the environment; participation in sustainable technological management

FL 2.2 / Grade 10-12 / 1. Explain and link the relationship between the technology and the other disciplines

FL 2.2 / Grade 11-12 / 3. Safely make objects and utensils or the methodologies in accord with the technological process by conveying the ideas through an image and models, leading to making things or conveying the concepts of the methodology through the models, and reporting on the results by using or presenting the achievements.

FL 2.2 / Grade 11-12 / 4. Have creativity in Problem-solving or responding to needs for their own products or development of others' products.

Objectives

Terminal Objectives

- 1) Students will be able to identify translation errors from raw Google Translate output by using Grammarly.
- 2) Students will be able to post-edit those translation errors with Grammarly.
- 3) Students will be able to create correct sentences by using Google Translate with Grammarly.

Enabling Objectives

- 1) Students will be able to classify translation errors from their raw Google Translate outputs into eleven categories of types of translation errors by using Grammarly.

2) Students will be able to post-edit those translation errors with Grammarly, given the post-editing level at the sentence level.

3) Students will be able to use Google Translate to render Thai sentences into English sentences and correctly post-edit those GT raw outputs with Grammarly as a proofreading tool.

4) Students will be able to use Google-Translate-Grammarly post-edited sentences to do EFL writing assignments.

Duration of Time: 1 hour

Materials: Online Thai-English Translation for Translation Race on PowerPoint, Introduction to Google Translate and Grammarly use on PowerPoint

Instructions:

1.) Introduction (10 minutes)

All students are asked to bring mobile devices installed with Google Translate and stay in groups for translation races. Students install Google Docs on their mobile devices and sync with the Teacher's Google Account. Each group stands in line.

- Teacher copies the Online Thai-English Translation Answer Sheet for Translation Race and pastes it onto the Google Doc server.
- Students are tasked to translate all Thai sentences to English using Google Translate within 2-3 minutes.
- Teacher reviews all the answers with the students.

2.) Teacher's presentation (20 minutes)

- Teacher displays Google Translate and teaches how to use it in general.
- Teacher displays Grammarly and teaches how to use its features to complement Google Translate, including color codings: red, blue, green, purple
- Teacher lets students use Google Translate with Grammarly with any text that can be found on the internet

2.) Students' presentation (25 minutes)

- Students are tasked to write an English paragraph about their dream date in 250-300 words by using Google Translate with Grammarly and submit it to the Teacher's Google Doc Account

5.) Teacher's Feedback (15 minutes)

Examples of Online Thai-English Translation for Translation Race on PowerPoint (The English sentences will appear on click of the Thai sentences)

ถ้าฉันไม่ได้เข้าเรียนสาย
ปานนี้คงทำการบ้านเสร็จไปนานแล้ว

If I hadn't been late for school, I would
have finished my homework long ago.

บ้านของเขาอยู่ในย่านชุมชนคน
เยอะๆ ใหม่ๆ

Is his house in a crowded area?

พ่อตัดสินใจเลิกเหล้าขาดแล้ว

My father has decided to quit drinking
completely.

ฉันซื้อกระโปรงพลีสตีดตัวนี้จาก
ต่างประเทศ

I bought this super-close pleated skirt
from overseas.

**Examples of the Introduction to Google Translate and Grammarly
use on PowerPoint**



B. The Second Instructional Period's lesson plan
(Introduction to 11 Types of Translation Errors: Part 1)

Goals and Objectives of Instructional Periods

Goals: At the end of the training, students will be able to render Thai sentences into English sentences using Google Translate and correctly post-edit those raw English outputs with Grammarly to develop their EFL writing assignments.

Standards and Indicators in Basic Education Core Curriculum B.E. 2551 (A.D., 2008)

Strand 2: Language and Culture

Standard F2.2: Understanding of the technology and technological processes; designing and making objects, utensils, or the methodologies through the creative technological processes; selective utilization of the technologies beneficial to one's life, society and the environment; participation in sustainable technological management

FL 2.2 / Grade 10-12 / 1. Explain and link the relationship between the technology and the other disciplines

FL 2.2 / Grade 11-12 / 3. Safely make objects and utensils or the methodologies in accord with the technological process by conveying the ideas through an image and models, leading to making things or conveying the concepts of the methodology through the models, and reporting on the results by using or presenting the achievements.

FL 2.2 / Grade 11-12 / 4. Have creativity in Problem-solving or responding to needs for their own products or development of others' products.

Objectives

Terminal Objectives

- 1) Students will be able to identify translation errors from raw Google Translate output by using Grammarly.
- 2) Students will be able to post-edit those translation errors with Grammarly.
- 3) Students will be able to create correct sentences by using Google Translate with Grammarly.

Enabling Objectives

- 1) Students will be able to classify translation errors from their raw Google Translate outputs into eleven categories of types of translation errors by using Grammarly

2) Students will be able to post-edit those translation errors with Grammarly, given the post-editing level at the sentence level.

3) Students will be able to use Google Translate to render Thai sentences into English sentences and correctly post-edit those GT raw outputs with Grammarly as a proofreading tool.

4) Students will be able to use Google-Translate-Grammarly post-edited sentences to do EFL writing assignments.

Duration of Time: 1 hour

Materials: 11 English Grammarly outputs with 11 Types of Translation Errors
Exercise: Part 1, 5 white drawing canvas and 5 sets of multi-colored magic markers,
 Introduction to 11 Types of Translation Errors Part 1 on PowerPoint

Instructions:

1.) Brainstorming (5 minutes)

- The teacher displays one example of English Grammarly outputs on the screen and reviews how Grammarly outputs work with four highlighted and underlined colors: red, blue, green, and purple.

- The teacher opens 11 English Grammarly outputs with 11 Types of Translation Errors Exercise: Part 1 on the screen and lets students scan a QR code linked to that file.

- The teacher scaffolds by asking students to match the first five English Grammarly outputs with the first five types of translation errors and explain more clues about each.

2.) Student groups' preparation (20 minutes)

- The students are divided into five groups. Each group makes mind maps for one type of translation error, which includes Punctuation, Prepositions, Determiners (Articles), Verb Form, and Noun Agreement. They are tasked to research descriptions of each translation error and match one English Grammarly output with their assigned type of translation error.

2.) Student groups' presentation (10 minutes)

- Each group presents one's mind maps in front of the classroom.

3.) Teacher's presentation (20 minutes)

- The teacher opens Introduction to 11 Types of Translation Errors Part 1 on PowerPoint, explains the first five types of translation errors: Punctuation, Prepositions, Determiners

(Articles), Verb Form, and Noun Agreement in full descriptions, and gives the correct answers of the matching exercise.

5.) Teacher's Feedback: Q&A Session (5 minutes)

11 English Grammarly Outputs with 11 Types of Translation Errors

Exercise: Part 1

Instructions: Match the five Grammarly outputs with their correct types of translation

Highlighted & Underlined Colors in Grammarly	<u>Red</u>	<u>Blue</u>	<u>Green</u>	<u>Purple</u>
Detected Translation Errors from Google Translate	Punctuation Preposition Determiners (Article) Verb Form Noun Agreement Pronoun Conjunction	Wordy/Unclear Reference	Word Choice	Polite/Professional

errors in the table.

Examples of 11 English Grammarly Outputs with 11 Types of Translation

1

Knowledge is not just from the **institution,** but from interactions with each other.

< Correctness · Remove the comma

...just from the institution **,** but from interactions...

It seems that you have an unnecessary comma. Consider removing the comma.

Some writers insert commas anytime they would pause slightly in speech, even if the comma isn't required by any rules of punctuation. Sometimes this is a good way to achieve a casual, speech-like effect in your writing, but the technique should be used sparingly. Using too many unnecessary commas can make your writing stilted and choppy.

Incorrect: I can't decide whether to have pizza, or a cheeseburger.

Correct: I can't decide whether to have pizza or a cheeseburger.

Incorrect: This winter was colder, than the past five winters.

Correct: This winter was colder than the past five winters.

2

This is an impact **from** the use of Facebook, which cannot control the publication of photos or information, making it easier to violate the rights of others.

< Correctness · Change preposition

...an impact **from of** the use of...

It seems that preposition use may be incorrect here.

Prepositions are function words that indicate how a noun or noun phrase relates to the rest of the sentence. Some prepositions, such as *in, on, after, or since*, express temporal or spatial relationships. In other cases, the relationship is more abstract and the best preposition to use may depend on the words around it. These are known as "dependent prepositions," and they do not follow any clear pattern. Choose prepositions carefully because sometimes changing a preposition can completely change the meaning of the phrase. A good dictionary will provide guidance on which prepositions to use with which words.

Incorrect: Dave ran **in the room** and told us the news.

Correct: Dave ran **into the room** and told us the news.

Errors Exercise: Part 1

Examples of 11 English Grammarly Outputs with 11 Types of Translation Errors

Exercise: Part 1 (Answer Sheet)

1. Punctuation

2. Preposition



Examples of the Introduction to 11 Types of Translation Errors Part 1 on PowerPoint

01

INTRO

Types of Translation Errors: Part 1

Nicha Kibamrungs

02 03 04 05 06

PUNCTUATION
PREPOSITION
DETERMINERS (ARTICLE)
VERB FORM
NOUN AGREEMENT


Nicha Kibamrungs
Nicha Kibamrungs
Nicha Kibamrungs
Nicha Kibamrungs
Nicha Kibamrungs

01

INTRO

Punctuation

Missing or misplaced full stops, commas, semicolons, colons, or quotation marks.



- Period**
Ends sentences and used in abbreviations
- Quotation Mark**
Indicates speech, a title, or slang
- Apostrophe**
Indicates possession or missing letters
- Ellipsis**
Signals omitted information, a pause, or trailing off
- Exclamation Point**
Used with interjections, exclamations, or strong comments
- Semicolon**
Links two closely related sentences
- Colon**
Introduces an element that illustrates or amplifies the clause before the colon
- Question Mark**
Shows a sentence is an inquiry
- Braces**
Forms a list within a list
- Hyphen**
Joins words or separates words' syllables
- Dash**
Sets apart an idea or element within a sentence
- Brackets**
Shows that words were added to a direct quotation
- Parentheses**
Sets apart clarifying elements or aides
- Comma**
Creates a separation or pause between words or phrases

02 03 04 05 06

PREPOSITION
DETERMINERS (ARTICLE)
VERB FORM
NOUN AGREEMENT

Nicha Kibamrungs
Nicha Kibamrungs
Nicha Kibamrungs
Nicha Kibamrungs

C. The Third Instructional Period's lesson plan
(Introduction to 11 Types of Translation Errors: Part 2)

Goals and Objectives of Instructional Periods

Goals: At the end of the training, students will be able to render Thai sentences into English sentences using Google Translate and correctly post-edit those raw English outputs with Grammarly to develop their EFL writing assignments.

Standards and Indicators in Basic Education Core Curriculum B.E. 2551 (A.D., 2008)

Strand 2: Language and Culture

Standard F2.2: Understanding of the technology and technological processes; designing and making objects, utensils, or the methodologies through the creative technological processes; selective utilization of the technologies beneficial to one's life, society and the environment; participation in sustainable technological management

FL 2.2 / Grade 10-12 / 1. Explain and link the relationship between the technology and the other disciplines

FL 2.2 / Grade 11-12 / 3. Safely make objects and utensils or the methodologies in accord with the technological process by conveying the ideas through an image and models, leading to making things or conveying the concepts of the methodology through the models, and reporting on the results by using or presenting the achievements.

FL 2.2 / Grade 11-12 / 4. Have creativity in Problem-solving or responding to needs for their own products or development of others' products.

Objectives

Terminal Objectives

- 1) Students will be able to identify translation errors from raw Google Translate output by using Grammarly.
- 2) Students will be able to post-edit those translation errors with Grammarly.
- 3) Students will be able to create correct sentences by using Google Translate with Grammarly.

Enabling Objectives

- 1) Students will be able to classify translation errors from their raw Google Translate outputs into eleven categories of types of translation errors by using Grammarly

2) Students will be able to post-edit those translation errors with Grammarly, given the post-editing level at the sentence level.

3) Students will be able to use Google Translate to render Thai sentences into English sentences and correctly post-edit those GT raw outputs with Grammarly as a proofreading tool.

4) Students will be able to use Google-Translate-Grammarly post-edited sentences to do EFL writing assignments.

Duration of Time: 1 hour

Materials: 11 English Grammarly outputs with 11 Types of Translation Errors
Exercise: Part 2, 6 white drawing canvas and 6 sets of multi-colored magic markers,
 Introduction to 11 Types of Translation Errors Part 2 on PowerPoint

Instructions:

1.) Brainstorming (5 minutes)

- The teacher displays one example of English Grammarly outputs on the screen and reviews how Grammarly outputs work with four highlighted and underlined colors: red, blue, green, and purple.

- The teacher opens 11 English Grammarly outputs with 11 Types of Translation Errors Exercise: Part 2 on the screen and lets students scan a QR code linked to that file.

- The teacher scaffolds by asking students to match the first five English Grammarly outputs with the last five types of translation errors and explain more clues about each.

2.) Student groups' preparation (20 minutes)

- The students are divided into six groups. Each group makes mind maps for one type of translation error, which includes Pronoun, Conjunction, Wordy/Unclear, Reference, Word Choice, and Polite/Professional. They are tasked to research descriptions of each translation error and match one English Grammarly output with their assigned type of translation error.

2.) Student groups' presentation (10 minutes)

- Each group presents one's mind maps in front of the classroom.

3.) Teacher's presentation (20 minutes)

- The teacher opens Introduction to 11 Types of Translation Errors Part 2 on PowerPoint, explains the last five types of translation errors: Pronoun, Conjunction, Wordy/Unclear,

Reference, Word Choice, and Polite/Professional in full descriptions, and gives the correct answers of the matching exercise.

5.) Teacher's Feedback: Q&A Session (5 minutes)

11 English Grammarly Outputs with 11 Types of Translation Errors Exercise:

Part 2

Instructions: Match the five Grammarly outputs with their correct types of translation

Highlighted & Underlined Colors in Grammarly	<u>Red</u>	<u>Blue</u>	<u>Green</u>	<u>Purple</u>
Detected Translation Errors from Google Translate	Punctuation Preposition Determiners (Article) Verb Form Noun Agreement Pronoun Conjunction	Wordy/Unclear Reference	Word Choice	Polite/Professional

errors in the table.

Examples of 11 English Grammarly Outputs with 11 Types of Translation Errors

Exercise: Part 2

1

"Personal digital footprint" or digital footprints, which are the history of our Internet usage through various programs, whether it is writing, images, behavior, visits, behavior, interactions or responses to other people, places traveled, or current locations, which are created and recorded through various programs such as search engines or social media such as Facebook, Instagram, Twitter, Social Cam, and others.

Correctness - Remove the comma

...or digital footprints, which are...

Accept Dismiss ...

Correctness - Correct pronoun usage

...footprints, whieh are the History...

It seems that there is a pronoun problem here.

A pronoun is a word that is used as a substitute for another noun or noun phrase. They come in a few different forms depending on what they refer to and how they're used in a sentence. Subject pronouns include *I, you, he, she, it, we, and they*. Object pronouns include *me, you, him, her, it, us, and them*. Possessive pronouns include *my, your, his, her, its, our, and their*.

Incorrect: Did you find **you** keys yet?
 Correct: Did you find **your** keys yet?

Incorrect: My car **it** is very new.
 Correct: My car is very new.

2

For general students, additional knowledge is found in the library. **But** for students in the food science program, their library is the supermarket, the cafeteria. In the introductory Food Science course, students have to go

Correctness - Rephrase

But However, for students in the food science program, their library is the supermarket **and** the cafeteria.

This sentence may contain incorrect or awkward phrasing. Consider changing it.

Our revised version of your text may make it easier to read.

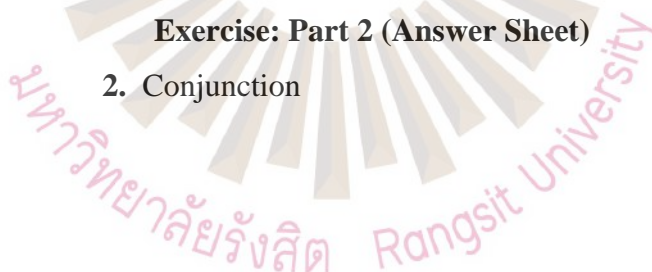
Rephrase Dismiss ...

Examples of 11 English Grammarly Outputs with 11 Types of Translation Errors

Exercise: Part 2 (Answer Sheet)

1. Pronoun

2. Conjunction



Examples of the Introduction to 11 Types of Translation Errors Part 2 on PowerPoint

01

Types of Translation Errors: Part 2

INTRO

Nicha Kitbamrung

02

03

04

05

06

07

PRONOUNS

CONJUNCTIONS

WORDY/UNCLEAR

REFERENCE

WORD CHOICE

POLITE/PROFESSIONAL

Nicha Kitbamrung

Nicha Kitbamrung

Nicha Kitbamrung

Nicha Kitbamrung

Nicha Kitbamrung

Nicha Kitbamrung

01

02

PRONOUNS

INTRO

PRONOUNS

Nicha Kitbamrung

Nicha Kitbamrung

Personal Pronouns: I/me, You, We/us, They/them, He/him, She/her, It
 - *Banita said she is almost finished with the application.*
 - *My family tests my patience, but I love them.*

Demonstrative Pronouns: that, this, these, those
 - *What a fantastic idea! This is the best thing I've heard all day.*
 - *if you think gardenias smell nice, try smelling these.*

Indefinite Pronouns: one, other, none, some, anybody, everybody, no one
 - *Everybody was late to work because of the traffic jam.*
 - *It matters more to some than to others.*

Relative Pronouns: that, what, which, who, whom
 - *The woman who called earlier didn't leave a message.*
 - *My car, which is nearly twenty years old, still runs well.*

Reflexive & Intensive Pronouns: myself, yourself, himself, herself, itself, oneself, ourselves, yourselves, themselves
 - *Lola made herself a smoothie to bring to class.*
 - *Take care of yourselves.*



03

04

05

06

07

CONJUNCTIONS

WORDY/UNCLEAR

REFERENCE

WORD CHOICE

POLITE/PROFESSIONAL

Nicha Kitbamrung

Nicha Kitbamrung

Nicha Kitbamrung

Nicha Kitbamrung

Nicha Kitbamrung

D. The Fourth Instructional Period's lesson plan
(The Revision of Google Translate use with Grammarly)

Goals and Objectives of Instructional Periods

Goals: At the end of the training, students will be able to render Thai sentences into English sentences using Google Translate and correctly post-edit those raw English outputs with Grammarly to develop their EFL writing assignments.

Standards and Indicators in Basic Education Core Curriculum B.E. 2551 (A.D., 2008)

Strand 2: Language and Culture

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FL 2.2 / Grade 10-12 / 1. Explain and link the relationship between the technology and the other disciplines

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FL 2.2 / Grade 11-12 / 4. Have creativity in Problem-solving or responding to needs for their own products or development of others' products.

Objectives

Terminal Objectives

- 1) Students will be able to identify translation errors from raw Google Translate output by using Grammarly.
- 2) Students will be able to post-edit those translation errors with Grammarly.
- 3) Students will be able to create correct sentences by using Google Translate with Grammarly.

Enabling Objectives

- 1) Students will be able to classify translation errors from their raw Google Translate outputs into eleven categories of types of translation errors by using Grammarly
- 2) Students will be able to post-edit those translation errors with Grammarly, given the post-editing level at the sentence level.
- 3) Students will be able to use Google Translate to render Thai sentences into English sentences and correctly post-edit those GT raw outputs with Grammarly as a proofreading tool.
- 4) Students will be able to use Google-Translate-Grammarly post-edited sentences to do EFL writing assignments.

Duration of Time: 1 hour

Materials: My Country, My Rules presentation on PowerPoint

Instructions:

1.) Brainstorming (5 minutes)

- The teacher displays the table of the 11 detected translation errors from Google Translate with the highlighted & underlined colors in Grammarly and revises the fundamental concept.

2.) Students' preparation (5 minutes)

- The teacher displays the My Country, My Rules presentation on the screen. The students get in pairs to complete activity 1: Imagine Your Vision. As if the students were world leaders, they would figure out what their vision would be that would be best beneficial to their countries. They can ask their partner if they agree or disagree and the reasons why.

- The teacher selects a few pairs of students to present in front of everyone for 1 minute

2.) Students' presentation (35 minutes)

- The students work on activity 2: Create Your Country individually. The students write an English paragraph in 400-450 words about the information of their country: Name, Currency, Population, National Resources, Economy Policies, International Relations Policies, Main Careers, Transportation, and Public Utilities by using Google Translate with Grammarly and submit to the teacher by scanning QR code.

3.) Teacher's presentation (10 minutes)

- The teacher revises the concept of Google Translate Use with Grammarly Features, 11 Types of Translation Errors, and how to use it in students' writing assignments.

5.) Teacher's Feedback: Q&A Session (5 minutes)

Examples of My Country, My Rules presentation on PowerPoint

ACTIVITY 1: IMAGINE YOUR VISION



GETTING IN PAIRS

- You are world leaders in the summit
- What is your vision which is best beneficial to your country?
- Tell your partner and ask them if they agree or disagree and why is that?
- Present in front of everyone for 1 minute

ACTIVITY 2: CREATE YOUR COUNTRY

ONE STUDENT / ONE COUNTRY




- You are country founders
- Give the info: Name, Currency, Population, National Resources, Economy Policies, International Relations Policies, Main Careers, Transportation, Public Utilities

NATIONAL INNOVATION POLICIES:
WHAT COUNTRIES DO YOU WANT TO BE? HOW WOULD YOU GO ABOUT IT?



WRITE 400-450 WORDS IN ENGLISH

EXAMPLES




EXAMPLES




มหาวิทยาลัยรังสิต Rangsit University

The logo of Rangsit University is centered on the page. It features a stylized flame or sunburst design at the top, with a circular arrangement of radiating lines below it. The text 'มหาวิทยาลัยรังสิต Rangsit University' is written in a semi-circle at the bottom of the logo.

APPENDIX C
POST-TRAINING QUESTIONNAIRE

มหาวิทยาลัยรังสิต Rangsit University

Post-Training Questionnaire
Adapted from Knowles (2021)

This students' post-training questionnaire form is designed to determine feelings, thoughts, or ideas about EFL writing's benefits and improvements after the training of Google Translate's use with Grammarly among Upper Secondary students at the Northern Thai government school Chiang Mai for the 2023 academic year. The form consists of two sections.

- | | |
|--------|--|
| Part 1 | General information about the training activities |
| Part 2 | Perceptions of Google Translate Use with Grammarly |

Part 1 General information about the training activities

- 1.1. Sex** Male Female
- 1.2. Major**.....
- 1.3. Did you finish all the activities in the training?** Yes No
- 1.4. What was the most beneficial part of this training?**
- Activity 1: Google Translate Use with Grammarly features
 - Activity 2: Introduction to 11 Types of Translation Errors Part 1
 - Activity 3: Introduction to 11 Types of Translation Errors Part 2
- 1.5. What was the least beneficial part of this assignment?**
- Activity 1: Google Translate Use with Grammarly features
 - Activity 2: Introduction to 11 Types of Translation Errors Part 1
 - Activity 3: Introduction to 11 Types of Translation Errors Part 2

Part 2 Perceptions of Google Translate Use with Grammarly

2.1. Please state the extent to which you agree or disagree with the following statements:

Attitudes	Scale				
	5	4	3	2	1
	Strongly Agree	Agree	Fairly Agree	Disagree	Strongly Disagree
After completing the Google Translate with Grammarly, I felt more prepared to use Google Translate with Grammarly well.					
The Google Translate with Grammarly assignment was beneficial to me.					
The Google Translate with Grammarly assignment was busy work.					
The Google Translate with Grammarly assignment made me feel more confident translating Thai-English during the training.					
The Google Translate with Grammarly assignment made me more reluctant to translate Thai- English during the training.					
Overall, The Google Translate with Grammarly assignment was beneficial in terms of learning writing English.					

2.2. What are the reasons you use Google Translate with Grammarly after the training?

- I am not confident in my own work.
- I run out of time and must complete the assignment before the deadline.
- I want to complete an English activity/assignment.
- I want to check my understanding of a text.
- I wanted to compare my written work to a translation.
- Other reasons.....(Please specify)

2.3. Please state the extent to which you agree or disagree with the following statements:

Attitudes	Scale				
	5	4	3	2	1
	Strongly Agree	Agree	Fairly Agree	Disagree	Strongly Disagree
I feel Google Translate use with Grammarly is a beneficial tool for learning a language.					
I feel Google Translate use with Grammarly will help me pass the class.					
I would recommend this training of Google Translate use with Grammarly to other students.					

Do you have any other comments about this training of Google Translate use with Grammarly?

The image features a large, faint watermark of the Rangsit University logo in the background. The logo consists of a stylized flame or sunburst design at the top, with a circular base containing the university's name in Thai and English. The text 'มหาวิทยาลัยรังสิต' is written in Thai script along the bottom curve of the circle, and 'Rangsit University' is written in English along the right side.

APPENDIX D

**RESULTS OF PURPOSES AND ATTITUDES IN USING GT AND
STUDENTS' PERCEPTION OF USING GRAMMARLY
QUESTIONNAIRES**

General information

Table 1 General information

Items	Pre-training		Post-training	
	Frequency	Percentage	Frequency	Percentage
Sex				
male	6	33.30	6	33.30
female	12	66.70	12	66.70
Total	18	100.00	18	100.00
Major				
English Program	18	100.00	18	100.00
Total	18	100.00	18	100.00
Do you use Grammarly in English Writing?				
yes	12	66.70	17	94.40
no	6	33.30	1	5.60
Total	18	100.00	18	100.00
What type of Grammarly application do you use?				
Free	9	50.00	10	55.60
Premium	1	5.60	3	16.60
I've never studied this before	8	44.40	5	27.80
Total	18	100.00	18	100.00
When do you use Grammarly in your English writing?				
Before joining this orientation	2	11.10	4	22.20
After joining this orientation	16	88.90	12	66.70
I've never studied this before	0	0.00	2	11.10
Total	18	100.00	18	100.00
What do you usually focus on while using Grammarly?				

Items	Pre-training		Post-training	
	Frequency	Percentage	Frequency	Percentage
Grammar checking	17	27.40	15	21.70
Spelling checking	11	17.70	13	18.90
Punctuation checking	8	12.90	13	18.90
Plagiarism checking	9	14.60	11	15.90
Clarity checking	17	27.40	17	24.60
Total	62	100.00	69	100.00
Do you like learning English?				
yes	18	100.00	17	94.40
no	0	0.00	1	5.60
Total	18	100.00	18	100.00
Do you use Google Translate (GT)?				
yes	18	100.00	14	77.80
no	0	0.00	4	22.20
Total	18	100.00	18	100.00
Do you use other machine translation?				
less than 10 times/week	7	38.90	10	55.60
more than 10 times/week	11	61.10	8	44.40
Total	21	100.00	18	100.00

Students' Perception of Using Grammarly

Table 3 Reasons for using Grammarly, usage of Grammarly, and Strengths and Weaknesses of Grammarly

Items	Pre-training		Post-training	
	Frequency	Percentage	Frequency	Percentage
Reasons for using Grammarly				
I used Grammarly to complement my teacher's feedback.	17	20.00	18	21.20
I started using Grammarly because of the recommendation from my teacher.	17	20.00	16	18.80
The grammar feedback made me feel more confident about submitting my assignment.	17	20.00	17	20.00
I am motivated when the teacher appreciates my English writing performance as a result of using Grammarly.	16	18.80	16	18.80
Grammarly can minimize the writing errors in my English writing.	18	21.20	18	21.20
Total	85	100.00	85	100.00
Usage of Grammarly				
Receiving grammar feedback on my assignment was important to me.	15	20.00	18	23.10
The grammar feedback focused on my major errors.	14	18.70	17	21.80
Sometimes, I ignore certain suggestions from Grammarly.	13	17.30	10	12.80
The errors were easy to understand because the explanations were clear.	16	21.30	16	20.50

Items	Pre-training		Post-training	
	Frequency	Percentage	Frequency	Percentage
Grammarly's feedback improved my language skills over the long term, as it helped me better understand grammatical rules.	17	22.70	17	21.80
Total	75	100.00	78	100.00
Strengths and Weaknesses of Grammarly				
I received a lot of useful suggestions on how to improve my grammar by using Grammarly.	17	23.60	18	25.70
I prefer feedback from lecturers over Grammarly.	13	18.10	11	15.70
Grammarly encourages me to do independent proofread independently.	17	23.60	16	22.90
I found some of Grammarly's feedback to be inaccurate.	7	9.70	8	11.40
Grammarly provides me with a performance score that measures the accuracy level of my writing based on the total word count and the number and types of writing issues detected.	18	25.00	17	24.30
Total	72	100.00	70	100.00

Purposes and Attitudes in Using GT

In this part, the respondents were asked to rate about the Purposes and Attitudes in Using GT by using closed-ended questions and the Likert-Scale from 1-5 (1= Never, 2= Seldom, 3= Sometimes, 4= Often, 5= Always). The opinions of respondents in each group were analyzed and the mean scores obtained were evaluated based on the following mean range criteria:

Mean Range	Level of Proficiency
4.21 – 5.00	Very High
3.41 – 4.20	High
2.61 – 3.40	Moderate
1.81 – 2.60	Low
1.00 – 1.80	Very Low

The results are summarized and presented in the tables as follows.

Table 4 Purposes and Frequency of GT Use

Item	Pre-training			Post-training		
	Mean	S.D.	Scale	Mean	S.D.	Scale
Reading Skill	3.24	0.72	Moderate	3.39	0.38	Moderate
Novels and Tales	2.89	1.23	Moderate	3.33	0.84	Moderate
Magazines	2.78	1.00	Moderate	3.00	1.02	Moderate
English News	3.17	1.42	Moderate	3.61	0.91	High
Product labels	3.56	0.98	High	3.72	0.75	High
Advertisements	3.50	1.15	High	3.28	1.01	Moderate
Signs	3.50	1.20	High	3.72	0.82	High
Epigrams and Proverbs	3.44	1.29	High	3.78	1.06	High
Texts on websites	4.22	0.94	Very High	4.11	0.67	High
Texts in an English textbook	4.22	1.00	Very High	4.39	0.69	Very High
Others	1.17	0.38	Very Low	1.17	0.38	Very Low

Item	Pre-training			Post-training		
	Mean	S.D.	Scale	Mean	S.D.	Scale
Writing Skill	3.35	0.50	Moderate	3.39	0.85	Moderate
English poems or English cards	3.33	1.13	Moderate	3.61	1.37	High
English emails	3.22	1.26	Moderate	3.56	1.14	High
English sentences or texts in exercises or assignments in an English course	4.22	0.73	Very High	3.83	0.78	High
English words. Messages, or comments on social media e.g. Facebook, Twitter, Instagram	4.06	0.72	High	3.78	0.94	High
Live chat on a social network	3.89	0.67	High	3.78	0.87	High
Others	1.39	0.50	Very Low	1.35	0.49	Very Low
Vocabulary Learning	3.51	0.83	High	3.62	0.46	High
General words	4.11	1.07	High	4.28	0.82	Very High
Technical terms	3.83	0.98	High	4.06	0.63	High
Names of places or institutes	3.83	0.85	High	4.28	0.66	Very High
Part of Speech	4.06	0.93	High	4.11	0.83	High
Others	1.29	0.47	Very Low	1.39	0.50	Very Low
Translation	2.94	0.76	Moderate	3.30	0.66	Moderate
Academic passages or articles	3.61	1.14	High	4.22	0.80	Very High

Item	Pre-training			Post-training		
	Mean	S.D.	Scale	Mean	S.D.	Scale
External reading books	3.39	1.09	Moderate	3.78	0.80	High
Official documents	2.94	1.47	Moderate	3.33	1.28	Moderate
Idioms or proverbs	3.33	1.08	Moderate	3.72	1.01	High
Others	1.44	0.51	Very Low	1.44	0.51	Very Low

Table 5 Attitudes towards GT Use

Item	Pre-training			Post-training		
	mean	S.D.	scale	mean	S.D.	scale
GT gives me more advantages than disadvantages.	3.50	0.61	High	3.78	0.87	High
GT is free and easy to access.	4.39	0.91	Very High	4.17	0.78	High
GT can translate texts quickly.	3.94	0.63	High	4.22	0.73	Very High
The quality of texts translated by GT is better than by my translation.	3.39	0.60	Moderate	3.50	1.04	High
I can rely on the accuracy of texts translated by GT (English to Thai translation).	3.22	0.73	Moderate	3.28	1.01	Moderate
I can rely on the accuracy of texts translated by GT (Thai to English translation).	3.22	0.80	Moderate	3.61	0.77	High

Item	Pre-training			Post-training		
	mean	S.D.	scale	mean	S.D.	scale
I gain a lot of vocabulary knowledge when I use GT.	3.72	0.82	High	3.83	0.92	High
I learned English grammar and structure using GT.	3.22	0.87	Moderate	3.39	0.97	Moderate
I understand an English passage better with the assistance of GT.	3.44	0.78	Moderate	3.56	0.92	High
Using GT, I do not need to remember new vocabulary or guess the meanings of words.	3.28	0.95	Moderate	3.22	1.16	Moderate
I feel more confident when using GT for English writing.	3.33	0.76	Moderate	3.50	0.78	High
I can write English sentences better with the assistance of GT.	3.56	0.78	High	3.56	0.92	High
GT makes me lazy when thinking and using my effort to read.	3.39	1.14	Moderate	3.39	1.19	Moderate
GT makes me lazy when thinking and using my effort in writing.	3.50	1.20	High	3.39	1.09	Moderate
I gain translation skills by using GT.	3.67	0.84	High	3.56	1.09	High
GT is more helpful and effective for students with	3.33	1.08	Moderate	3.72	0.75	High

Item	Pre-training			Post-training		
	mean	S.D.	scale	mean	S.D.	scale
low English than those with high English competency.						
GT is equally helpful and effective for both students with low and high English competency.	3.72	0.82	High	3.61	0.85	High
Students with lower English proficiency depend more on GT in learning English than students with average or high proficiency.	3.56	0.98	High	3.89	0.83	High
Average scores	3.52	0.57	High	3.62	0.66	High

The image features a large, faint watermark of the Rangsit University logo in the background. The logo consists of a central flame-like symbol above a semi-circular arrangement of radiating lines, with the university's name in Thai and English below it.

APPENDIX D

**RATED IOC FORMS OF RESEARCH INSTRUMENTS FROM
THREE EXPERTS**



มหาวิทยาลัยรังสิต Rangsit University T. (66) 2997 2200-30
เมืองรังสิต รังสิตรังสิต Muang-Ake, Pathumthani Rd. F. (66) 2791 5757
จ.ปทุมธานี 12000 Pathumthani 12000, Thailand E. info@rsu.ac.th

STC.4800/0731

13 December 2024

Subject: Invitation to be our IOC (Item Objective Congruence) expert

Dear Expert 1

Rangsit University Language Institute

Miss Nicha Niruttipong student number 6407476, a student in the Master of Education (Bilingual Education) who has already completed her coursework and thesis proposal defense on 30 April 2024. Her research is entitled "Implementing the Use of Google Translation with Grammarly to Enhance Thai Upper Secondary School Students' English Writing Ability". Currently, she is in the stage of collecting and analyzing data. Assoc. Prof. Dr. Sumalee Chinokul is her advisor.

Miss Nicha Niruttipong has finished designing her research instruments. Thus, the college would like to invite you to validate these instruments. The package has been attached herewith.

I truly appreciate your kind support in this matter and hope that you will accept my invitation.

Sincerely yours,

A handwritten signature in blue ink that reads 'Anchalee Chayanuvat'.

Assistant Professor Anchalee Chayanuvat, Ed.D.

Program Director of Bilingual Education

Suryadhep Teachers College

Rangsit University

มหาวิทยาลัยรังสิต Rangsit University

Evaluation Form of Item Objective Congruence

Post-Training Questionnaire after the training of Google Translate and Grammarly Use

Instructions

Please evaluate to what extent congruence exists between the objectives and the following items by putting a tick (✓) in the box where the score agrees with your opinions. Please also provide suggestions if necessary.

Score Descriptions

- 1 means the objectives and the items are **congruent**.
- 0 means the objectives and the items are **questionable**.
- 1 means the objectives and the items are **Incongruent**.

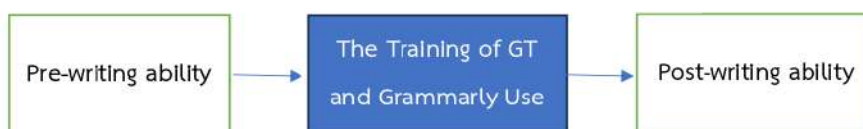
Objective of the Instrument

To determine the feelings, thoughts, or ideas of upper secondary students at Kawila Wittayalai School Chiang Mai about the benefits and improvements of EFL writing after the training of Google Translate's use with Grammarly for the 2023 academic year.

Description

In this study, the Post-Training Questionnaire has been developed in English and Thai based on Knowles (2021). It will elicit upper secondary students' responses regarding their perceptions after participating in the training on using Google Translate with Grammarly and what they are willing to do once they have completed the training.

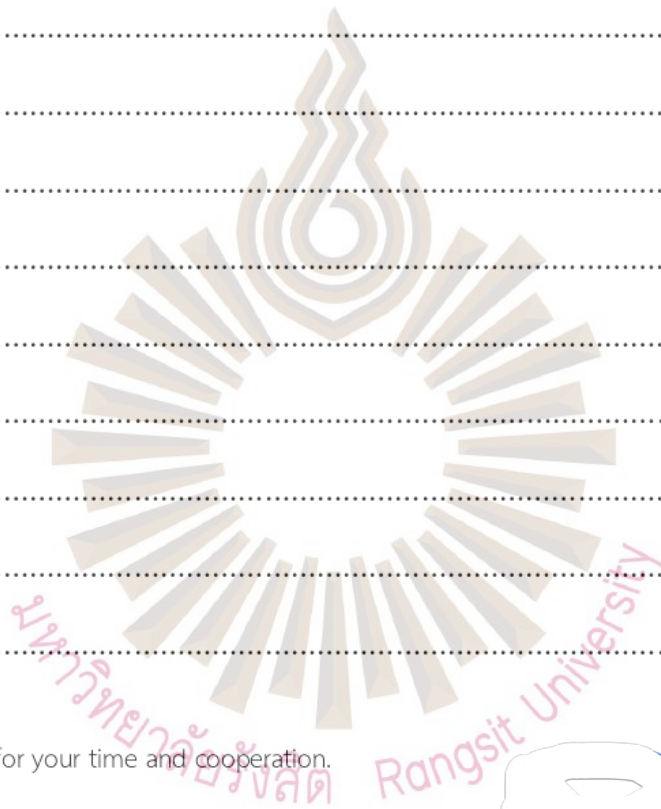
This instrument will be used after the training of Google Translate and Grammarly Use according to a theoretical framework for this study.



Part 1 The Post-Training Questionnaire				
Is the Post-Training Questionnaire appropriate for getting students' responses to examine their feelings, thoughts, or ideas about the benefits and improvements of EFL writing after the training of Google Translate's use with Grammarly?				
Sections	Rating			Suggestions
	-1	0	1	
1. General information about the training activities			✓	
2. Perceptions of Google Translate Use with Grammarly			✓	
Part 2 Overall Evaluation				
1. The Post-Training Questionnaire suits Upper Secondary students.			✓	
2. The scenarios of the Post-Training Questionnaire are appropriate and relate to the students' familiar situations.			✓	
3. All sections of The Post-Training Questionnaire can elicit students' responses regarding their perceptions after participating in the training on using Google Translate with Grammarly and what they are willing to do once they have completed the training			✓	

Additional comments:

NA.



Thank you for your time and cooperation.

Expert 1's signature

(Expert 1)

Expert
1 / Dec 2024

Evaluation Form of Item Objective Congruence

Instructional Period's lesson plans in the training of Google Translate and Grammarly Use

Instructions

Please evaluate to what extent congruence exists between the objectives and the following items by putting a tick (✓) in the box where the score agrees with your opinions. Please also provide suggestions if necessary.

Score Descriptions

- 1 means the objectives and the items are **congruent**.
- 0 means the objectives and the items are **questionable**.
- 1 means the objectives and the items are **incongruent**.

Objective of the Instrument

To train upper secondary students at Kawila Wittayalai School Chiang Mai about using Google Translate with the Grammarly application for the 2023 academic year in the training of Google Translate and Grammarly Use.

Description

In this study, the researcher has developed the instructional period's lesson plans based on these goals and objectives.

Goals and Objectives of Instructional Periods

Goals: At the end of the training, students will be able to render Thai sentences into English sentences using Google Translate and correctly post-edit those raw English outputs with Grammarly to develop their EFL writing assignments.

Standards and Indicators In Basic Education Core Curriculum B.E. 2551 (A.D., 2008)

Strand 2: Language and Culture

Standard F2.2: Appreciation of similarities and differences between language and culture of native and Thai speakers and capacity for accurate and appropriate use of language

FL 2.2 / Grade 11-12 / 1. Explain or compare differences between the structures of sentences, texts, idioms, sayings, proverbs, and poems in foreign languages and the Thai language.

Objectives

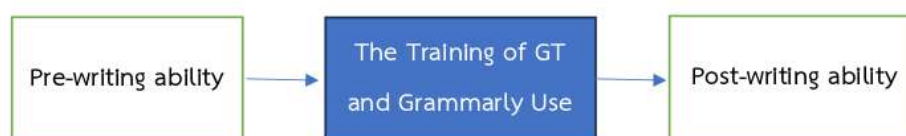
Terminal Objectives

- 1) Students will be able to identify translation errors from raw Google Translate outputs.
- 2) Students will be able to post-edit those translation errors with Grammarly.
- 3) Students will be able to create correct sentences by using Google Translate with Grammarly

Enabling Objectives

- 1) Students will be able to classify translation errors from their raw Google Translate outputs into seven categories of types of translation errors.
- 2) Students will be able to post-edit those translation errors with Grammarly, given the post-editing level at the sentence level.
- 3) Students will be able to use Google Translate to render Thai sentences into English sentences and correctly post-edit those GT raw outputs with Grammarly as a proofreading tool.
- 4) Students will be able to use Google-Translate-Grammarly post-edited sentences to do EFL writing assignments.

This instrument will be used in the training of Google Translate and Grammarly Use according to a theoretical framework for this study.



Part 1 Instructional Period's lesson plans				
Are the Instructional Period's lesson plans relevant to the standards and indicators from Basic Education Core Curriculum B.E. 2551 (A.D.2008) for upper secondary students?				
Items	Rating			Suggestions
	-1	0	1	
Students will be able to explain or compare differences between the structures of sentences, texts, idioms, sayings, proverbs, and poems in foreign languages and the Thai language regarding the Instructional Period's lesson plans.			✓	
Students will be able to classify translation errors from their raw Google Translate outputs into seven categories of types of translation errors regarding the Instructional Period's lesson plans.			✓	
Students will be able to post-edit those translation errors with Grammarly, given the post-editing level at the sentence level regarding the Instructional Period's lesson plans.			✓	
Students will be able to use Google Translate to render Thai sentences into English sentences and correctly post-edit those GT raw outputs with Grammarly as a proofreading tool regarding the Instructional Period's lesson plans.			✓	
Students will be able to use Google-Translate-Grammarly post-edited sentences to do EFL writing assignments regarding the Instructional Period's lesson plans.			✓	

Part 2 Overall Evaluation			
1. The instructional period's lesson plans suit Upper Secondary students.			✓
2. All the materials in the instructional period's lesson plans are appropriate and relate to the students' familiar situations.			✓
3. All the instructional period's lesson plans can help students render Thai sentences into English sentences using Google Translate and correctly post-edit those raw English outputs with Grammarly for developing their EFL writing assignments.			✓



Additional comments:

All slides are easy to understand
and suit the students' English
level.



Thank you for your time and cooperation.

Expert 1's signature

Expert 1

Expert
1, Dec, 2024

Evaluation Form of Item Objective Congruence

Online Student's Thai-English Translation Worksheet In Pre- and Post-Writing Ability Tests

Instructions

Please evaluate to what extent congruence exists between the objectives and the following items by putting a tick (✓) in the box where the score agrees with your opinions. Please also provide suggestions if necessary.

Score Descriptions

- 1 means the objectives and the items are **congruent**.
- 0 means the objectives and the items are **questionable**.
- 1 means the objectives and the items are **Incongruent**.

Objective of the Instrument

To investigate Kawila Wittayalai School Chiang Mai upper secondary student's translation errors from Thai to English used in the pre- and post-writing ability tests for the 2023 academic year.

Description

Regarding Pojprasat (2007) and Wongranu (2017) errors in the translation model, where Thai EFL students took a session on the topic of translation between Thai and English using machine translation, the errors were categorized into two types: syntactic and semantic. Syntactic errors had the highest frequency, implying that the students usually made grammatical errors when translating. Semantic errors had the second highest frequency. In the meantime, Tongpoon-Patanasorn & Griffith (2020) indicated that 15 types of translation errors were encountered in 54 academic abstracts from Thai to English produced by Google Translate. The researcher combined two instruments in Table 1.1, which shows the results of error types in the form of frequencies found in students' academic abstract translations categorized by syntactic and semantic errors

and the percentage of the errors provided. All translation error types are divided by colour-code keys in Grammarly: red, blue, green, and purple.

Table 1.1 below shows the types of errors encountered in the 54 academic abstracts translated from Thai to English by Google Translate, categorized by syntactic or semantic errors, and color-coding keys in Grammarly (Pojprasart, 2007; Wongranu, 2017; Tongpoon-Patanasorn & Griffith, 2020; Drolet, 2023)

Error Types	Explanation	Number of instances	Percentage
Capitalization (Syntactic)	Either missing or unsuitable capital letters	234	20.58
Punctuation (Syntactic)	Missing or misplaced full stops, commas, semicolons, colons, or quotation marks	227	19.96
Fragment (Syntactic)	Incomplete phrases or missing clauses, subjects, verbs, or objects	185	16.27
Wordy/Unclear (Semantic)	Too many unnecessary words or unclear phrases that convey incomprehensible meaning	91	8.00
Preposition (Syntactic)	Missing or misuse of prepositions or prepositional phrases	67	5.89
Word Choice (Semantic)	Variety of vocabulary used to express a clear meaning	63	5.54
Reference (Semantic)	Isolated word or phrase with no connection to previous or subsequent ideas	49	4.31
Determiners (Syntactic)	Missing or misuse of definite or indefinite articles, quantifiers, numbers, and possessives	47	4.13
Repetition (Syntactic)	Word or phrase repeated with no obvious purpose	42	3.69
Verb Form (Syntactic)	Misuse of or unsuitable verb tense, voice, phrase, clause or case	27	2.37

Noun Agreement (Syntactic)	Count or non-count noun or plural agreements	24	2.11
Word Form (Syntactic)	Incorrect part of speech	23	2.02
Sentence Structure (Syntactic)	Missing, incorrect, non-sequential sentence components	22	1.93
Pronoun (Syntactic)	Incorrect pronoun; misuse of or missing relative pronoun	21	1.85
Conjunction (Syntactic)	Incorrect or missing conjunction	15	1.32
Total		1137	100

Color-coding Keys In Grammarly

Correctness in Red underlined helps you improve spelling, grammar, and punctuation. Examples of Correctness errors are confused words, incorrect noun numbers, wrong or missing prepositions, faulty verb tense, incorrect verb form, comma misuse, faulty subject-verb agreement, misplaced words or phrases, punctuation in compound or complex sentences, misspelled words, misuse of semicolons, quotation marks, etc., determiner use (a/an/the/this/etc.), and pronoun use.

Clarity in Blue underlined makes your writing easier to understand. Clarity errors include unclear sentences, wordy sentences, unclear paragraphs, hard-to-read texts, passive voice misuse, and intricate texts.

Engagement in Green underlined suggests changing words to make your writing more effective and interesting. Examples of Engagement errors are word choice and fluency.

Delivery in Purple underlined helps you use the right language register (academic and formal writing). Delivery errors include inappropriate colloquialisms, tone suggestions, and incomplete sentences.

The research instrument used to investigate the participants' translation errors from Thai to English is taken from Thai articles in the Jamjuree Journal of Chulalongkorn University as clippings. The researcher developed the tests consisting of 8 Thai article clippings adapted to be appropriate for the participants' level (Pojprasat, 2007). When the Thai clippings are translated into English via Google Translate, only 10 out of 15 Tongpoon-Patanasom & Griffith's Error Types are detected, including Punctuation, Unclear, Preposition, Word Choice, Reference, Verb Form, and Conjunction. This means that Google Translate Artificial Intelligence or AI in 2024 is much more syntactically and semantically developed than in 2020. When users request an Adaptive Translation of Google launched in February 2024, it imports the text to be translated and a small dataset of translated examples of as many as 30,000. The findings included Google Adaptive Translation outperforming old Google Translate with an up to 23% increase in quality (Google Cloud, 2024).

Table 1.2 below shows 10 types of errors, which are highlighted in yellow rows encountered in the 12 Thai article clippings from Thai to English by Google Translate, categorized by syntactic or semantic errors, and color-coding keys in Grammarly (Pojprasart, 2007; Wongranu, 2017; Tongpoon-Patanasorn & Griffith, 2020; Drolet, 2023)

Error Types	Explanation	Number of Instances	Percentage
Capitalization (Syntactic)	Either missing or unsuitable capital letters	234	20.58
Punctuation (Syntactic)	Missing or misplaced full stops, commas, semicolons, colons, or quotation marks	227	19.96
Fragment (Syntactic)	Incomplete phrases or missing clauses, subjects, verbs, or objects	185	16.27

Wordy/Unclear (Semantic)	Too many unnecessary words or unclear phrases that convey incomprehensible meaning	91	8.00
Preposition (Syntactic)	Missing or misuse of prepositions or prepositional phrases	67	5.89
Word Choice (Semantic)	Variety of vocabulary used to express a clear meaning	63	5.54
Reference (Semantic)	Isolated word or phrase with no connection to previous or subsequent ideas	49	4.31
Determiners (Syntactic)	Missing or misuse of definite or indefinite articles, quantifiers, numbers, and possessives	47	4.13
Repetition (Syntactic)	Word or phrase repeated with no obvious purpose	42	3.69
Verb Form (Syntactic)	Misuse of or unsuitable verb tense, voice, phrase, clause or case	27	2.37
Noun Agreement (Syntactic)	Count/non-count noun or plural agreements	24	2.11
Word Form (Syntactic)	Incorrect part of speech	23	2.02
Sentence Structure (Syntactic)	Missing, incorrect, non-sequential sentence components	22	1.93
Pronoun (Syntactic)	Incorrect pronoun; misuse of or missing relative pronoun	21	1.85
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Color-coding Keys In Grammarly

Correctness In Red underlined helps you improve spelling, grammar, and punctuation. Examples of Correctness errors are confused words, incorrect noun numbers, wrong or missing prepositions, faulty verb tense, incorrect verb form, comma misuse, faulty subject-verb agreement, misplaced words or phrases, punctuation in compound or complex sentences, misspelled words, misuse of semicolons, quotation marks, etc., determiner use (a/an/the/this/etc.), and pronoun use.

Clarity In Blue underlined makes your writing easier to understand. Clarity errors include unclear sentences, wordy sentences, unclear paragraphs, hard-to-read texts, passive voice misuse, and intricate texts.

Engagement In Green underlined suggests changing words to make your writing more effective and interesting. Examples of Engagement errors are word choice and fluency.

Delivery In Purple underlined helps you use the right language register (academic and formal writing). Delivery errors include inappropriate colloquialisms, tone suggestions, and incomplete sentences.

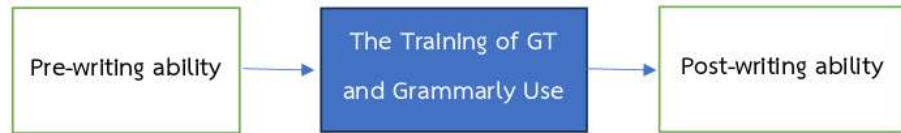


The researcher designs the table in Figure 1 by summarizing the essence of Table 1.2 together. Therefore, this table is equipped to categorize all detected Google Translate translation errors and put those in 4 highlighted and underlined colors in Grammarly.


Highlighted & Underlined Colors In Grammarly	<u>Red</u>	<u>Blue</u>	<u>Green</u>	<u>Purple</u>
Detected Translation Errors from Google Translate	Punctuation Preposition Determiners (Article) Verb Form Noun Agreement Pronoun Conjunction	Wordy/Unclear Reference	Word Choice	Polite/Professional

Figure 1 The main table of Detected Translation Errors from Google Translate and Highlighted & Underlined Colors on Grammarly

This instrument will be used in the pre- and post-writing ability tests according to a theoretical framework for this study.



Part 1 Online Student's Thai-English Translation Worksheet														
Is the title clear?														
Items	Rating			Suggestions										
	-1	0	1											
Title: Online Student's Thai-English Translation Worksheet			✓											
Are the instructions clearly described?														
Instructions: Complete this form with 8 assigned clippings by correctly following the instructions attached to each item. When encountering errors in translation in Google Translate text, indicate which type of translation error is based on the table below, along with red, blue, green, and purple highlights, bolds, and underlines as determined by Grammarly. — correct translation errors in the Grammarly outputs as many rounds as needed until there are none.			✓											
Is the table of Highlighted & Underlined Colors In Grammarly and Detected Translation Errors from Google Translate appropriate and easy to use?														
The table:														
<table border="1"> <thead> <tr> <th>Highlighted & Underlined Colors in Grammarly</th> <th>Red</th> <th>Blue</th> <th>Green</th> <th>Purple</th> </tr> </thead> <tbody> <tr> <td>Detected Translation Errors From Google Translate</td> <td>Punctuation Preposition Determiners (Article) Verb Form Noun Agreement Pronoun Conjunction</td> <td>Wordy/Unclear Reference</td> <td>Word Choice</td> <td>Polite/Professional</td> </tr> </tbody> </table>	Highlighted & Underlined Colors in Grammarly	Red	Blue	Green	Purple	Detected Translation Errors From Google Translate	Punctuation Preposition Determiners (Article) Verb Form Noun Agreement Pronoun Conjunction	Wordy/Unclear Reference	Word Choice	Polite/Professional				<p>These colors are easy to catch my eyes.</p> <p>✓</p>
Highlighted & Underlined Colors in Grammarly	Red	Blue	Green	Purple										
Detected Translation Errors From Google Translate	Punctuation Preposition Determiners (Article) Verb Form Noun Agreement Pronoun Conjunction	Wordy/Unclear Reference	Word Choice	Polite/Professional										

Is the blank space appropriate for pasting 8 article clippings and easy to use?				
Items	Rating			Suggestions
	-1	0	1	
<p>The blank space:</p> <p>The Article Clipping # (Number 1-8)</p> 			✓	
Is the title of number 1 clear?				
Title: 1. Translated text by Google Translate via Google Lens			✓	
Are the instructions of number 1 clearly described?				
Instructions: Use your Google Translate application to translate Thai text into English using Google Lens. Copy and paste the English text below.			✓	
Is the title of number 2 clear?				
Title: 2. Grammarly correctness and rephrasing in round #1			✓	
Are the instructions of number 2 clearly described?				
Instructions: Paste the translated text by Google Translate in Number 1 on the Grammarly Application. When encountering errors in translation in Google Translate text, indicate which type of translation error is based on the table below, along with red , blue , green , and purple highlights, bolds , and underlines as determined by Grammarly.			✓	

Are the titles of detected translation errors round #1 In number 2 clear?				
Items	Rating			Suggestions
	-1	0	1	
<p>The titles in colors:</p> <p>Detected translation errors in round #1</p> <p>Correctness Errors (Red underlines):</p> <p>Clarity Errors (Blue underlines):</p> <p>Engagement Errors (Green underlines):</p> <p>Delivery Errors (Purple underlines):</p>			✓	
Is the title of number 3 clear?				
Title: 3. Grammarly correctness and rephrasing in round #2			✓	
Are the instructions of number 3 clearly described?				
<p>Instructions: Paste the Grammarly post-edited outputs round #1 on the Grammarly Application. When encountering errors in translation in Google Translate text, indicate which type of translation error is based on the table below, along with red, blue, green, and purple highlights, bolds, and underlines as determined by Grammarly.</p>			✓	
Are the titles of detected translation errors round #2 In number 3 clear?				
<p>The titles in colors:</p> <p>Detected translation errors in round #2</p> <p>Correctness Errors (Red underlines):</p> <p>Clarity Errors (Blue underlines):</p> <p>Engagement Errors (Green underlines):</p> <p>Delivery Errors (Purple underlines):</p>			✓	
Are the title of number 4 clear?				
Title: 4. Final Grammarly post-edited outputs			✓	

Are the instructions of number 4 clearly described?				
Items	Rating			Suggestions
	-1	0	1	
Instructions: Paste the final Grammarly outputs from Number 3, which are all correct. The Grammarly Application says, Great Job or Well Done!			✓	

Part 2 Overall Evaluation				
Items	Rating			Suggestions
	-1	0	1	
1. The test is appropriate to use for examining upper secondary students' writing ability in terms of producing translated text using Google Translate outputs and Grammarly proofread text outputs.			✓	
2. The test format is appropriate.			✓	
3. All the used materials in this test are appropriate.			✓	

Additional comments:

I think most tests are long
that may cause students to feel
overwhelmed. Just my thoughts.

Thank you for your time and cooperation.



Expert 1's signature

Expert 1

Expert

1 / Dec / 2024



Evaluation Form of Item Objective Congruence

Purposes and Attitudes In Using GT Questionnaire In the Pre- and Post-Writing Ability Tests

Instructions

Please evaluate to what extent congruence exists between the objectives and the following items by putting a tick (✓) in the box where the score agrees with your opinions. Please also provide suggestions if necessary.

Score Descriptions

- 1 means the objectives and the items are **congruent**.
- 0 means the objectives and the items are **questionable**.
- 1 means the objectives and the items are **Incongruent**.

Objective of the Instrument

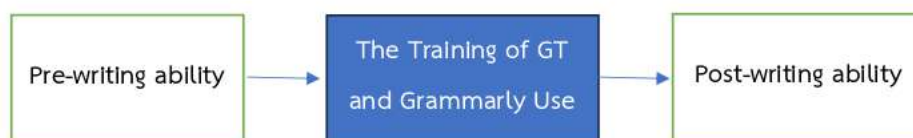
To examine purposes and attitudes towards using Google Translate (GT) for English language learning among Upper Secondary students at Kawila Wittayalai School Chiang Mai, the 2023 academic year in the pre- and post-writing ability tests.

Description

In this study, the Purposes and Attitudes in Using GT Questionnaire has been developed both in English and Thai based on Sukkwan A. (2014) & Chompurach W. (2021). It will be used to elicit Upper Secondary students' responses regarding students' purposes of GT use for English learning, attitudes, benefits and drawbacks, and problems and solutions when using GT. Questionnaire items are created based on literature review and related studies. The questionnaire contained five sections: general information of the participants, purposes of GT use for English learning of GT users, attitudes towards the use of GT, general comments on benefits and drawbacks of GT, and problems and solutions in using GT. There are general comments about

benefits, drawbacks, issues, and solutions to using GT, which are open-ended questions at the end of this questionnaire.

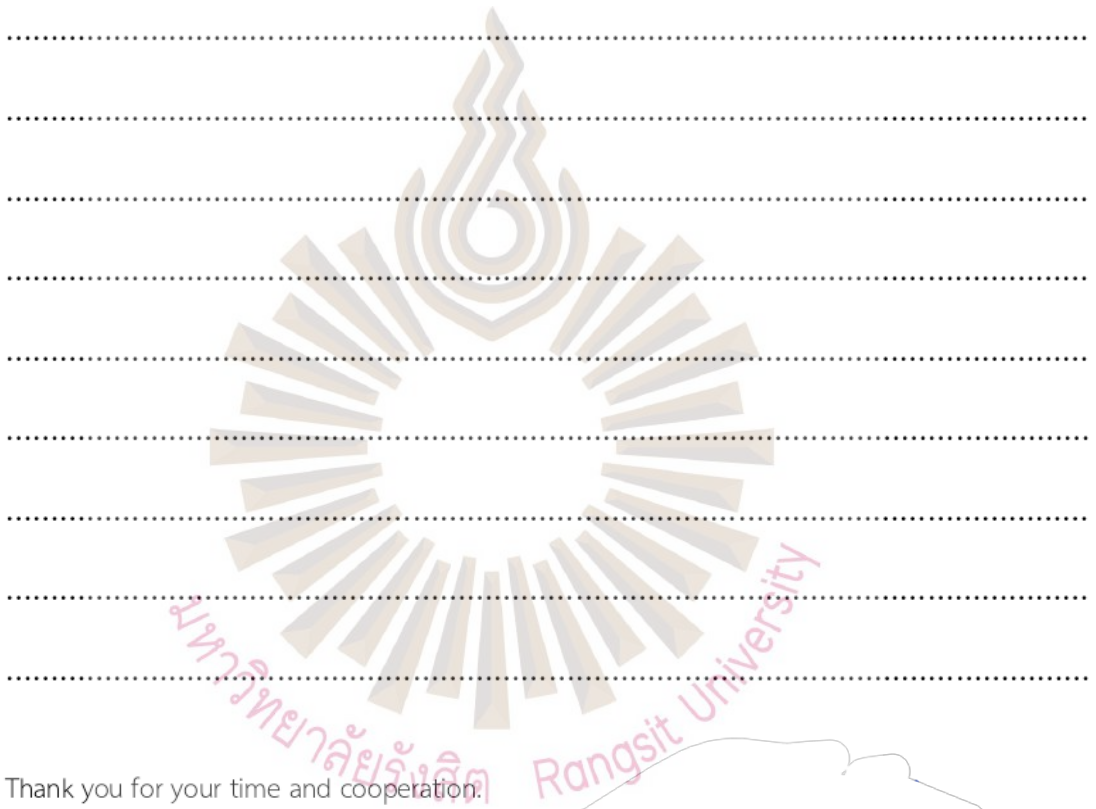
This instrument will be used in in the pre- and post-writing ability tests according to a theoretical framework for this study.



Part 1 the Purposes and Attitudes In Using GT Questionnaire				
Is the Purposes and Attitudes in Using GT Questionnaire appropriate to get students' responses due to examine their purposes and attitudes?				
Sections	Rating			Suggestions
	-1	0	1	
1. General information			✓	
2. Purposes and frequency of GT use			✓	
3. Attitudes towards using GT			✓	
4. General comments about GT			✓	
5. Problems found when using GT and solutions			✓	
Part 2 Overall Evaluation				
1. The Purposes and Attitudes in Using GT Questionnaire is suitable for Upper Secondary students.			✓	
2. The theme for the Purposes and Attitudes in Using GT Questionnaire is appropriate and relates to the students' familiar situations.			✓	
3. All sections of the writing task can elicit students' responses regarding writing errors of Google Translate use from Thai to English for Upper Secondary Thai students			✓	

Additional comments:

All is clear.



Thank you for your time and cooperation.

Expert 1's signature
Expert 1
Expert
1 / Dec 2024

Evaluation Form of Item Objective Congruence
Students' Perception of Using Grammarly Questionnaire In
the Pre- and Post-writing Ability Tests.

Instructions

Please evaluate to what extent congruence exists between the objectives and the following items by putting a tick (✓) in the box where the score agrees with your opinions. Please also provide suggestions if necessary.

Score Descriptions

- 1 means the objectives and the items are **congruent**.
- 0 means the objectives and the items are **questionable**.
- 1 means the objectives and the items are **Incongruent**.

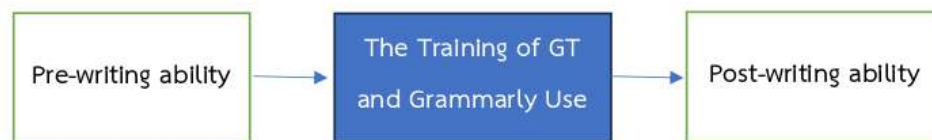
Objective of the Instrument

To determine the behaviors of Grammarly use among Upper Secondary students at Kawila Wittayalai School Chiang Mai for the 2023 academic year in the pre- and post-writing ability tests.

Description

In this study, the Students' Perception of Using Grammarly Questionnaire has been developed both in English and Thai based on O'Neill & Russell (2019) and Rejeki S. (2023). It will elicit upper secondary students' responses regarding students' perceptions of their proficiency in using Grammarly for academic writing. The researcher uses a closed-ended questionnaire in the form of a Likert scale. The statement consists of 5 answer choices: strongly agree, agree, neutral, disagree, and strongly disagree. Students only choose one option based on their views. The questionnaire adapted by O'Neill & Russell (2019) consists of 3 indicators of students' perceived knowledge of using Grammarly.

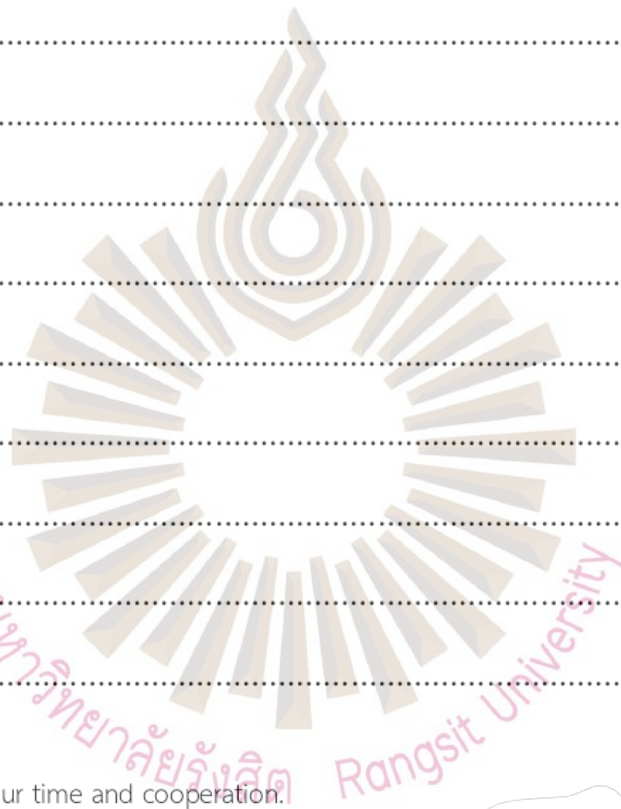
This instrument will be used in the pre- and post-writing ability tests according to a theoretical framework for this study.



Part 1 Students' Perception of Using Grammarly Questionnaire					
Is the Students' Perception of Using Grammarly Questionnaire appropriate for getting students' responses to examine their behaviors of Grammarly use?					
Sections		Rating			Suggestions
		-1	0	1	
Part 1 General Information about Grammarly				✓	
Part 2 Grammarly Use's Questionnaire Aspects					
Aspects	Indicators				
Accepting	Reasons for using Grammarly			✓	
Understanding	Usage of Grammarly				
Evaluating	Strengths and Weaknesses of Grammarly				
Part 2 Overall Evaluation					
1. The Students' Perception of Using Grammarly Questionnaire suits Upper Secondary students.				✓	
2. The scenarios for the Students' Perception of Using Grammarly Questionnaire are appropriate and relate to the students' familiar situations.				✓	
3. All sections of the Students' Perception of Using Grammarly Questionnaire can elicit students' responses regarding their perceptions of their proficiency in using Grammarly for academic writing				✓	

Additional comments:

AN is easy to understand.



Thank you for your time and cooperation.

Expert 1's signature

(Expert 1)
Expert
1, Da, 2054



มหาวิทยาลัยรังสิต Rangsit University T. (66) 2997 2209-30
 ถนนพหลโยธิน รังสิต กรุงเทพมหานคร Muang-Ake, Patholyothin Rd. F. (66) 2791 5757
 12000 Pothumthani 12000, Thailand E. info@rsu.ac.th

STC.4800/0729

13 December 2024

Subject: Invitation to be our IOC (Item Objective Congruence) expert

Dear Expert 2,
 Chulalongkorn University Language Institute, Chulalongkorn University

Miss Nicha Niruttipong student number 6407476, a student in the Master of Education (Bilingual Education) who has already completed her coursework and thesis proposal defense on 30 April 2024. Her research is entitled "Implementing the Use of Google Translation with Grammarly to Enhance Thai Upper Secondary School Students' English Writing Ability". Currently, she is in the stage of collecting and analyzing data Assoc. Prof. Dr. Sumalee Chinokul is her advisor.

Miss Nicha Niruttipong has finished designing her research instruments. Thus, the college would like to invite you to validate these instruments. The package has been attached herewith.

I truly appreciate your kind support in this matter and hope that you will accept my invitation.

Sincerely yours,

Assistant Professor Anchalee Chayanuvat, Ed.D.
 Program Director of Bilingual Education
 Suryadhep Teachers College
 Rangsit University

Post-Training Questionnaire

Adapted from Knowles (2021)

This students' post-training questionnaire form is designed to determine feelings, thoughts, or ideas about EFL writing's benefits and improvements after the training of Google Translate's use with Grammarly among Upper Secondary students at Kawila Wittayalai School Chiang Mai for the 2023 academic year. The form consists of two sections.

Part 1 General information about the training activities

Part 2 Perceptions of Google Translate Use with Grammarly

Part 1 General information about the training activities

- 1.1. Sex Male Female
- 1.2. Major.....
- 1.3. Did you finish all the activities in the training? Yes No
- 1.4. What was the most beneficial part of this training?
- Activity 1: Google Translate Use with Grammarly features
 - Activity 2: Introduction to 11 Types of Translation Errors Part 1
 - Activity 3: Introduction to 11 Types of Translation Errors Part 2
- 1.5. What was the least beneficial part of this assignment?
- Activity 1: Google Translate Use with Grammarly features
 - Activity 2: Introduction to 11 Types of Translation Errors Part 1
 - Activity 3: Introduction to 11 Types of Translation Errors Part 2

Part 2 Perceptions of Google Translate Use with Grammarly

2.1. Please state the extent to which you agree or disagree with the following statements:

Attitudes	Scale				
	5	4	3	2	1
	Strongly Agree	Agree	Fairly Agree	Disagree	Strongly Disagree
After completing the Google Translate with Grammarly, I felt more prepared to use Google Translate with Grammarly well.					
The Google Translate with Grammarly assignment was beneficial to me.					
The Google Translate with Grammarly assignment was busy work.					
The Google Translate with Grammarly assignment made me feel more confident translating Thai-English during the training.					
The Google Translate with Grammarly assignment made me more reluctant to translate Thai- English during the training.					
Overall, The Google Translate with Grammarly assignment was beneficial in terms of learning writing English.					

2.2. What are the reasons you use Google Translate with Grammarly after the training?

- I am not confident in my own work.
- I run out of time and must complete the assignment before the deadline.
- I want to complete an English activity/assignment.
- I want to check my understanding of a text.
- I wanted to compare my written work to a translation.
- Other reasons.....(Please specify)

2.3. Please state the extent to which you agree or disagree with the following statements:

Attitudes	Scale				
	5	4	3	2	1
	Strongly Agree	Agree	Fairly Agree	Disagree	Strongly Disagree
I feel Google Translate use with Grammarly is a beneficial tool for learning a language.					
I believe that using I-feel Google Translate use-with Grammarly will help me pass the class.					
I would recommend this training of Google Translate use with Grammarly to other students.					

2.4. Do you have any other comments about this training of Google Translate use with Grammarly?



Evaluation Form of Item Objective Congruence
Post-Training Questionnaire after the training of Google Translate and Grammarly Use

Instructions

Please evaluate to what extent congruence exists between the objectives and the following items by putting a tick (✓) in the box where the score agrees with your opinions. Please also provide suggestions if necessary.

Score Descriptions

- 1 means the objectives and the items are **congruent**.
- 0 means the objectives and the items are **questionable**.
- 1 means the objectives and the items are **incongruent**.

Objective of the Instrument

To determine the feelings, thoughts, or ideas of upper secondary students at Kawila Wittayalai School Chiang Mai about the benefits and improvements of EFL writing after the training of Google Translate's use with Grammarly for the 2023 academic year.

Description

In this study, the Post-Training Questionnaire has been developed in English and Thai based on Knowles (2021). It will elicit upper secondary students' responses regarding their perceptions after participating in the training on using Google Translate with Grammarly and what they are willing to do once they have completed the training.

This instrument will be used after the training of Google Translate and Grammarly Use according to a theoretical framework for this study.



Part 1 The Post-Training Questionnaire				
Is the Post-Training Questionnaire appropriate for getting students' responses to examine their feelings, thoughts, or ideas about the benefits and improvements of EFL writing after the training of Google Translate's use with Grammarly?				
Sections	Rating			Suggestions
	-1	0	1	
1. General information about the training activities			/	
2. Perceptions of Google Translate Use with Grammarly			/	
Part 2 Overall Evaluation				
1. The Post-Training Questionnaire suits Upper Secondary students.			/	
2. The scenarios of the Post-Training Questionnaire are appropriate and relate to the students' familiar situations.			/	
3. All sections of The Post-Training Questionnaire can elicit students' responses regarding their perceptions after participating in the training on using Google Translate with Grammarly and what they are willing to do once they have completed the training			/	

Additional comments:

Although the items are understandable, some statements should be rephrased to enhance clarity and avoid repetition. For example, the first item in the perception section might be:

“After using Google Translate with Grammarly, I felt more confident about using them effectively together.”

The last item in the same section might be:

“Overall, the Google Translate with Grammarly assignment was helpful for improving my English writing skills.”



Students' Perception of Using Grammarly Questionnaire

Adapted from O'neill & Russell (2019) and Rejeki S. (2023)

This students' perception of using Grammarly Application form is designed to determine the behaviors of Grammarly use among Upper Secondary students at Kawila Wittayalai School Chiang Mai for the 2023 academic year. The form consists of two sections.

- Part 1 General information about Grammarly user?
- Part 2 Indicators: Reasons for using Grammarly, usage of Grammarly,
And Strengths and Weaknesses of Grammarly

Part I General information about Grammarly user?

1. Sex: male female
2. Major:
3. Do you usually use Grammarly in English Writing? yes no
4. What type of Grammarly application that you use? Free Premium
5. When do you use Grammarly in your English writing?
 - Before joining this orientation
 - After joining this orientation
6. What do you usually focus on while using Grammarly?
 - Grammar checking
 - Spelling checking
 - Punctuation checking
 - Plagiarism checking
 - Clarity checking

Part 2 Rating Statements: Reasons for using Grammarly, usage of Grammarly, and Strengths and Weaknesses of Grammarly

Indicators	Statements	Yes	No
Reasons for using Grammarly	2.1. I use Grammarly to complement the-my teacher's feedback. (see comment below)		
	2.2. I use-started using Grammarly because of the recommendation from the my teacher.		
	2.3. The grammar feedback made me feel more confident about handing-the submitting my assignment. in .		
	2.4. I am motivated when the teacher appreciates my English writing performance as a result of using Grammarly.		
	2.5. Grammarly can minimize the writing errors in my English writing.		
Usage of Grammarly	2.6. It was important for me to get grammar feedback on my assignment. Receiving grammar feedback on my assignment was important to me.		
	2.7. The grammar feedback focused on my main-major errors.		
	2.8. Sometimes, I ignore some-certain suggestions from Grammarly.		
	2.9. It was easy to understand the errors because the explanations given were clear. The errors were easy to understand because the explanations were clear.		
	2.10. The Grammarly feedback developed my language long-term as I could understand the grammatical rules more. Grammarly's feedback improved my language skills over the long term, as it helped me better understand grammatical rules.		
	2.11. I got received a lot of useful suggestions about how to improve my grammar by using Grammarly.		
	2.12. I prefer feedback from lecturers rather than over Grammarly.		

Strengths and Weaknesses of Grammarly	2.13. Grammarly encourages me to do independent proofreading. <u>to proofread independently.</u>		
	2.14. I found some feedback from Grammarly that needed to be more accurate. <u>I found some of Grammarly's feedback to be inaccurate."</u>		
	2.15. Grammarly gives-provides me a performance score that calculates <u>measures</u> the accuracy level of my writing based on the total word count and the number and types of writing issues detected.		

Evaluation Form of Item Objective Congruence

Students' Perception of Using Grammarly Questionnaire in the Pre- and Post-writing Ability Tests.

Instructions

Please evaluate to what extent congruence exists between the objectives and the following items by putting a tick (✓) in the box where the score agrees with your opinions. Please also provide suggestions if necessary.

Score Descriptions

- 1 means the objectives and the items are **congruent**.
- 0 means the objectives and the items are **questionable**.
- 1 means the objectives and the items are **incongruent**.

Objective of the Instrument

To determine the behaviors of Grammarly use among Upper Secondary students at Kawila Wittayalai School Chiang Mai for the 2023 academic year in the pre- and post-writing ability tests.

Description

In this study, the Students' Perception of Using Grammarly Questionnaire has been developed both in English and Thai based on O'neill & Russell (2019) and Rejeki S. (2023). It will

elicit upper secondary students' responses regarding students' perceptions of their proficiency in using Grammarly for academic writing. The researcher uses a closed-ended questionnaire in the form of a Likert scale. The statement consists of 5 answer choices: strongly agree, agree, neutral, disagree, and strongly disagree. Students only choose one option based on their views. The questionnaire adapted by O'Neill & Russell (2019) consists of 3 indicators of students' perceived knowledge of using Grammarly.

This instrument will be used in the pre- and post-writing ability tests according to a theoretical framework for this study.



Part 1 Students' Perception of Using Grammarly Questionnaire					
Is the Students' Perception of Using Grammarly Questionnaire appropriate for getting students' responses to examine their behaviors of Grammarly use?					
Sections		Rating			Suggestions
		-1	0	1	
Part 1 General information about Grammarly				/	- Part 1: General information about Grammarly user - Part 2: Aspects of Grammarly Usage
Part 2 Grammarly Use's Questionnaire Aspects				/	
Aspects	Indicators			/	
Accepting	Reasons for using Grammarly			/	
Understanding	Usage of Grammarly			/	
Evaluating	Strengths and Weaknesses of Grammarly			/	
Part 2 Overall Evaluation					
1. The Students' Perception of Using Grammarly Questionnaire suits Upper Secondary students.			/		See additional comments.
2. The scenarios for the Students' Perception of Using Grammarly Questionnaire are appropriate and relate to the students' familiar situations.			/		
3. All sections of the Students' Perception of Using Grammarly Questionnaire can elicit students' responses regarding their perceptions of their proficiency in using Grammarly for academic writing			/		

Additional comments:

1. The 2.1 statement “I use Grammarly to complement my teacher’s feedback.” may be difficult for the students to understand. You may change it to
“I use Grammarly to supplement (or to add to) my teacher’s feedback and improve my writing.”
2. I made some suggestions about the language use in the question items above.



Part 2 Purposes and Frequency of GT Use

No.	Purposes	Frequency (Times per week)				
		5	4	3	2	1
		Always	Often	Sometimes	Seldom	Never
6.	How often do you use GT? Times per week (Specify) <i>How often do you use Google Translate for each of the following purposes? Please specify the number of times per week.</i>					
7. 6.	READING SKILL					
	7.1. Novels and Tales					
	7.2. Magazines					
	7.3. English News					
	7.4. Product labels					
	7.5. Advertisements					
	7.6. Signs					
	7.7. Epigrams and Proverbs					
	7.8. Texts on websites					
	7.9. Texts in an English textbook					
	7.10. Others..... (Specify)					
8. 7. (and so on)	WRITING SKILL					
	8.1. English poems or English cards					
	8.2. English emails					
	8.3. English sentences or texts in exercises or assignments in an English course					

	8.4. English words, M essages, or comments on social media, e.g., Facebook, Twitter, Instagram					
	8.5. Live chat on a social network					
	8.6. Others..... (Specify)					
9.	VOCABULARY LEARNING					
	9.1. General words					
No.	Purposes	Frequency (Times per week)				
		5	4	3	2	1
		Always	Often	Sometimes	Seldom	Never
	9.2. Technical terms					
	9.3. Names of places or institutes					
	9.4. Parts of Speech					
	9.5. Others..... (Specify)					
10.	TRANSLATION					
	10.1. Academic passages or articles					
	10.2. External reading books					
	10.3. Official documents					
	10.4. Idioms or proverbs					
	10.5. Others..... (Specify)					

Part 3 Attitudes towards GT Use

No.	Attitudes	Scale				
		5	4	3	2	1
		Strongly Agree	Agree	Fairly Agree	Disagree	Strongly Disagree
11.	GT gives me offers more advantages than disadvantages.					
12.	GT is free and easy to access.					

13.	GT can translate texts quickly.					
14.	The quality of texts translated by GT is better than by my translation.					
15.	I can rely on the accuracy of texts translated by GT (English to Thai translation).					
No.	Attitudes	Scale				
		5	4	3	2	1
		Strongly Agree	Agree	Fairly Agree	Disagree	Strongly Disagree
16.	I can rely on the accuracy of texts translated by GT (Thai to English translation).					
17.	I gain a lot of vocabulary knowledge when I use GT.					
18.	I learn English grammar and structure from using GT.					
19.	I understand an English passage better with the assistance of GT.					
20.	Using GT, I do not need to remember new vocabulary or guess the meanings of words.					
21.	I feel more confident when using GT for English writing.					
22.	I can write English sentences better with the assistance of GT.					
23.	GT makes me lazy to think in thinking and using and to use my effort in reading.					
24.	GT makes me lazy to think in thinking and using and to use my effort in writing.					
25.	I gain translation skills from using GT.					
26.	GT is more helpful and effective for students with low English competency than those with high English competency.					
27.	GT is equally helpful and effective for both students with low and high English competency.					
28.	Poor students depend more on GT in learning English rather than average and good students. <u>Students with lower English proficiency depend more on GT in learning English than students with average or high proficiency.</u>					

Part 4 General comments about GT

Advantages

- 1.
- 2.
- 3.
- 4.

Disadvantages

- 1.
- 2.
- 3.
- 4.

Part 5 Writing errors found when using GT and solutions.

- 1.
Solutions
- 2.
Solutions
- 3.
Solutions
- 4.
Solutions



Evaluation Form of Item Objective Congruence

Purposes and Attitudes in Using GT Questionnaire in the Pre- and Post-Writing Ability Tests

Instructions

Please evaluate to what extent congruence exists between the objectives and the following items by putting a tick (✓) in the box where the score agrees with your opinions. Please also provide suggestions if necessary.

Score Descriptions

- 1 means the objectives and the items are **congruent**.
- 0 means the objectives and the items are **questionable**.
- 1 means the objectives and the items are **incongruent**.

Objective of the Instrument

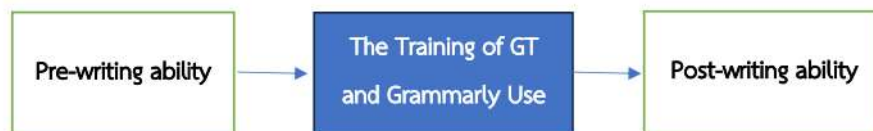
To examine purposes and attitudes towards using Google Translate (GT) for English language learning among Upper Secondary students at Kawila Wittayalai School Chiang Mai, the 2023 academic year in the pre- and post-writing ability tests.

Description

In this study, the Purposes and Attitudes in Using GT Questionnaire has been developed both in English and Thai based on Sukhwan A. (2014) & Chompurach W. (2021). It will be used to elicit Upper Secondary students' responses regarding students' purposes of GT use for English learning, attitudes, benefits and drawbacks, and problems and solutions when using GT. Questionnaire items are created based on literature review and related studies. The questionnaire contained five sections: general information of the participants, purposes of GT use for English learning of GT users, attitudes towards the use of GT, general comments on benefits and drawbacks of GT, and problems and solutions in using GT. There are general comments about

benefits, drawbacks, issues, and solutions to using GT, which are open-ended questions at the end of this questionnaire.

This instrument will be used in in the pre- and post-writing ability tests according to a theoretical framework for this study.



Part 1 the Purposes and Attitudes in Using GT Questionnaire				
Is the Purposes and Attitudes in Using GT Questionnaire appropriate to get students' responses due to examine their purposes and attitudes?				
Sections	Rating			Suggestions
	-1	0	1	
1. General information			/	See additional comments
2. Purposes and frequency of GT use		/		
3. Attitudes towards using GT			/	
4. General comments about GT			/	
5. Problems found when using GT and solutions			/	
Part 2 Overall Evaluation				
1. The Purposes and Attitudes in Using GT Questionnaire is suitable for Upper Secondary students.			/	
2. The theme for the Purposes and Attitudes in Using GT Questionnaire is appropriate and relates to the students' familiar situations.			/	
3. All sections of the writing task can elicit students' responses regarding writing errors of Google Translate use from Thai to English for Upper Secondary Thai students			/	

Additional comments:

1. The main question in the Purposes and frequency of GT use section should be rephrased. For example, “How often do you use Google Translate for each of the following purposes? Please specify the number of times per week”.
Also, since this question applies to all the following skills, you don't need to number it, and participants can refer to it as the overarching question for the subsequent ones.
2. I made some suggestions about the language use in the question items above.



Evaluation Form of Item Objective Congruence

Online Student's Thai-English Translation Worksheet in Pre- and Post-Writing Ability Tests

Instructions

Please evaluate to what extent congruence exists between the objectives and the following items by putting a tick (✓) in the box where the score agrees with your opinions. Please also provide suggestions if necessary.

Score Descriptions

- 1 means the objectives and the items are **congruent**.
- 0 means the objectives and the items are **questionable**.
- 1 means the objectives and the items are **incongruent**.

Objective of the Instrument

To investigate Kawila Wittayalai School Chiang Mai upper secondary student's translation errors from Thai to English used in the pre- and post-writing ability tests for the 2023 academic year.

Description

Regarding Pojprasat (2007) and Wongranu (2017) errors in the translation model, where Thai EFL students took a session on the topic of translation between Thai and English using machine translation, the errors were categorized into two types: syntactic and semantic. Syntactic errors had the highest frequency, implying that the students usually made grammatical errors when translating. Semantic errors had the second highest frequency. In the meantime, Tongpoon-Patanasorn & Griffith (2020) indicated that 15 types of translation errors were encountered in 54 academic abstracts from Thai to English produced by Google Translate. The researcher combined two instruments in Table 1.1, which shows the results of error types in the form of frequencies found in students' academic abstract translations categorized by syntactic and semantic errors

and the percentage of the errors provided. All translation error types are divided by colour-code keys in Grammarly: red, blue, green, and purple.

Table 1.1 below shows the types of errors encountered in the 54 academic abstracts translated from Thai to English by Google Translate, categorized by syntactic or semantic errors, and color-coding keys in Grammarly (Pojprasart, 2007; Wongranu, 2017; Tongpoon-Patanasorn & Griffith, 2020; Drolet, 2023)

Error Types	Explanation	Number of Instances	Percentage
Capitalization (Syntactic)	Either missing or unsuitable capital letters	234	20.58
Punctuation (Syntactic)	Missing or misplaced full stops, commas, semicolons, colons, or quotation marks	227	19.96
Fragment (Syntactic)	Incomplete phrases or missing clauses, subjects, verbs, or objects	185	16.27
Wordy/Unclear (Semantic)	Too many unnecessary words or unclear phrases that convey incomprehensible meaning	91	8.00
Preposition (Syntactic)	Missing or misuse of prepositions or prepositional phrases	67	5.89
Word Choice (Semantic)	Variety of vocabulary used to express a clear meaning	63	5.54
Reference (Semantic)	Isolated word or phrase with no connection to previous or subsequent ideas	49	4.31
Determiners (Syntactic)	Missing or misuse of definite or indefinite articles, quantifiers, numbers, and possessives	47	4.13
Repetition (Syntactic)	Word or phrase repeated with no obvious purpose	42	3.69
Verb Form (Syntactic)	Misuse of or unsuitable verb tense, voice, phrase, clause or case	27	2.37

Noun Agreement (Syntactic)	Count or non-count noun or plural agreements	24	2.11
Word Form (Syntactic)	Incorrect part of speech	23	2.02
Sentence Structure (Syntactic)	Missing, incorrect, non-sequential sentence components	22	1.93
Pronoun (Syntactic)	Incorrect pronoun; misuse of or missing relative pronoun	21	1.85
Conjunction (Syntactic)	Incorrect or missing conjunction	15	1.32
Total		1137	100

Color-coding Keys in Grammarly

Correctness in Red underlined helps you improve spelling, grammar, and punctuation. Examples of Correctness errors are confused words, incorrect noun numbers, wrong or missing prepositions, faulty verb tense, incorrect verb form, comma misuse, faulty subject-verb agreement, misplaced words or phrases, punctuation in compound or complex sentences, misspelled words, misuse of semicolons, quotation marks, etc., determiner use (a/an/the/this/etc.), and pronoun use.

Clarity in Blue underlined makes your writing easier to understand. Clarity errors include unclear sentences, wordy sentences, unclear paragraphs, hard-to-read texts, passive voice misuse, and intricate texts.

Engagement in Green underlined suggests changing words to make your writing more effective and interesting. Examples of Engagement errors are word choice and fluency.

Delivery in Purple underlined helps you use the right language register (academic and formal writing). Delivery errors include inappropriate colloquialisms, tone suggestions, and incomplete sentences.

The research instrument used to investigate the participants' translation errors from Thai to English is taken from Thai articles in the Jamjuree Journal of Chulalongkorn University as clippings. The researcher developed the tests consisting of 8 Thai article clippings adapted to be appropriate for the participants' level (Pojprasat, 2007). When the Thai clippings are translated into English via Google Translate, only 10 out of 15 Tongpoon-Patanasom & Griffith's Error Types are detected, including Punctuation, Unclear, Preposition, Word Choice, Reference, Verb Form, and Conjunction. This means that Google Translate Artificial Intelligence or AI in 2024 is much more syntactically and semantically developed than in 2020. When users request an Adaptive Translation of Google launched in February 2024, it imports the text to be translated and a small dataset of translated examples of as many as 30,000. The findings included Google Adaptive Translation outperforming old Google Translate with an up to 23% increase in quality (Google Cloud, 2024).

Table 1.2 below shows 10 types of errors, which are highlighted in yellow rows encountered in the 12 Thai article clippings from Thai to English by Google Translate, categorized by syntactic or semantic errors, and color-coding keys in Grammarly (Pojprasart, 2007; Wongranu, 2017; Tongpoon-Patanasom & Griffith, 2020; Drolet, 2023)

Error Types	Explanation	Number of Instances	Percentage
Capitalization (Syntactic)	Either missing or unsuitable capital letters	234	20.58
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Word Form (Syntactic)	Incorrect part of speech	23	2.02
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Total		1137	100

Color-coding Keys in Grammarly

Correctness in Red underlined helps you improve spelling, grammar, and punctuation. Examples of Correctness errors are confused words, incorrect noun numbers, wrong or missing prepositions, faulty verb tense, incorrect verb form, comma misuse, faulty subject-verb agreement, misplaced words or phrases, punctuation in compound or complex sentences, misspelled words, misuse of semicolons, quotation marks, etc., determiner use (a/an/the/this/etc.), and pronoun use.

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Engagement in Green underlined suggests changing words to make your writing more effective and interesting. Examples of Engagement errors are word choice and fluency.

Delivery in Purple underlined helps you use the right language register (academic and formal writing). Delivery errors include inappropriate colloquialisms, tone suggestions, and incomplete sentences.

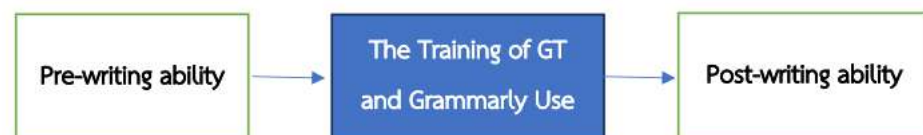


The researcher designs the table in Figure 1 by summarizing the essence of Table 1.2 together. Therefore, this table is equipped to categorize all detected Google Translate translation errors and put those in 4 highlighted and underlined colors in Grammarly.


Highlighted & Underlined Colors in Grammarly	Red	Blue	Green	Purple
Detected Translation Errors from Google Translate	Punctuation Preposition Determiners (Article) Verb Form Noun Agreement Pronoun Conjunction	Wordy/Unclear Reference	Word Choice	Polite/Professional

Figure 1 The main table of Detected Translation Errors from Google Translate and Highlighted & Underlined Colors on Grammarly

This instrument will be used in the pre- and post-writing ability tests according to a theoretical framework for this study.



Part 1 Online Student's Thai-English Translation Worksheet				
Is the title clear?				
Items	Rating			Suggestions
	-1	0	1	
Title: Online Student's Thai-English Translation Worksheet.			/	If you mean the worksheet is for students, removing the apostrophe makes it more clear.
Are the instructions clearly described?				
<p>Instructions: Complete this form with 8 assigned clippings by correctly following the instructions attached to each item. When encountering errors in translation in Google Translate text, indicate which type of translation error is based on the table below, along with <u>red</u>, <u>blue</u>, <u>green</u>, and <u>purple</u> highlights, bolds, and underlines as determined by Grammarly. — correct translation errors in the Grammarly outputs as many rounds as needed until there are none.</p> <p>Complete this form with the 8 assigned clippings by following the instructions attached to each item. When you encounter translation errors in the text generated by Google Translate, indicate the type of error based on the table below. Use red, blue, green, and purple highlights, along with bold and underlined text, as indicated by Grammarly. Correct the translation errors in Grammarly's outputs as many rounds as needed until no errors remain.</p>		/		Rephrase to ease readers' understanding.
Is the table of Highlighted & Underlined Colors in Grammarly and Detected Translation Errors from Google Translate appropriate and easy to use?				
The table:			/	

Highlighted & Underlined Colors in Grammarly	Red	Blue	Green	Purple				
Detected Translation Errors From Google Translate	Punctuation Preposition Determiners (Article) Verb Forms Noun Agreement Pronoun Conjunction	Wordy/Unclear Reference	Word choice	Polite/Professional				
Is the blank space appropriate for pasting 8 article clippings and easy to use?								
Items	Rating			Suggestions				
	-1	0	1					
<p>The blank space:</p> <p>The Article Clipping # (Number 1-8)</p> 			/					
Is the title of number 1 clear?								
Title: 1. Translated text by Google Translate via Google Lens			/	Text translated by Google Translate via Google Lens				
Are the instructions of number 1 clearly described?								
Instructions: Use your Google Translate application to translate Thai text into English using Google Lens. Copy and paste the English text below.			/	Use the Google Translate app to translate the Thai text into English using Google Lens. Then, copy and paste the English translation below.				

Is the title of number 2 clear?				
Title: 2. Grammarly correctness and rephrasing in round #1		/	Grammarly's corrections and rephrasing in Round #1 revision.	
Are the instructions of number 2 clearly described?				
Instructions: Paste the translated text by Google Translate in Number 1 on the Grammarly Application. When encountering errors in translation in Google Translate text, indicate which type of translation error is based on the table below, along with red , blue , green , and purple highlights, bolds, and underlines as determined by Grammarly.		/	Rephrase the instructions based on the first Instructions above.	
Are the titles of detected translation errors round #1 in number 2 clear?				
Items	Rating			Suggestions
	-1	0	1	
The titles in colors: Detected translation errors in round #1 Correctness Errors (Red underlines): Clarity Errors (Blue underlines): Engagement Errors (Green underlines): Delivery Errors (Purple underlines):		/		Color codes for error types
Is the title of number 3 clear?				
Title: 3. Grammarly correctness and rephrasing in round #2		/	Refer to the comment for Round#1.	
Are the instructions of number 3 clearly described?				
Instructions: Paste the Grammarly post-edited outputs round #1 on the Grammarly Application. When encountering errors in translation in Google Translate text, indicate which type of translation error is based on the table below, along with red , blue , green , and purple highlights, bolds, and underlines as determined by Grammarly.		/	Rephrase the instructions based on the first Instructions above.	

Are the titles of detected translation errors round #2 in number 3 clear?				
The titles in colors:		/		Color codes for error types
Detected translation errors in round #2				
Correctness Errors (Red underlines):				
Clarity Errors (Blue underlines):				
Engagement Errors (Green underlines): ..				
Delivery Errors (Purple underlines):				
Are the title of number 4 clear?				
Title: 4. Final Grammarly post-edited outputs		/		

Are the instructions of number 4 clearly described?				
Items	Rating			Suggestions
	-1	0	1	
Instructions: Paste the final Grammarly outputs from Number 3, which are all correct. The Grammarly Application says, Great Job or Well Done!	/			Paste the final Grammarly outputs from Item #3, which should all be correct. When the text is error-free, the Grammarly application will display a message such as "Great Job" or "Well Done!".

Part 2 Overall Evaluation				
Items	Rating			Suggestions
	-1	0	1	
1. The test is appropriate to use for examining upper secondary students' writing ability in terms of producing translated text using Google Translate outputs and Grammarly proofread text outputs.		/		
2. The test format is appropriate.			/	
3. All the used materials in this test are appropriate.		/		

Additional comments:

Since the texts to be translated are complex and use authentic language, and all the instructions are in English, I'm unsure if the task is too advanced given the students' English proficiency levels.

I believe an initial survey is needed to assess the students' English levels before selecting the texts. If this has already been done in any way, it would be useful to include this information in the instrument section of the research proposal.



Expert 2's signature

Expert 2

Expert

13 / _12_ / _24_

Evaluation Form of Item Objective Congruence

Instructional Period's lesson plans in the training of Google Translate and Grammarly Use

Instructions

Please evaluate to what extent congruence exists between the objectives and the following items by putting a tick (✓) in the box where the score agrees with your opinions. Please also provide suggestions if necessary.

Score Descriptions

- 1 means the objectives and the items are **congruent**.
- 0 means the objectives and the items are **questionable**.
- 1 means the objectives and the items are **incongruent**.

Objective of the Instrument

To train upper secondary students at Kawila Wittayalai School Chiang Mai about using Google Translate with the Grammarly application for the 2023 academic year in the training of Google Translate and Grammarly Use.

Description

In this study, the researcher has developed the instructional period's lesson plans based on these goals and objectives.

Goals and Objectives of Instructional Periods

Goals: At the end of the training, students will be able to render Thai sentences into English sentences using Google Translate and correctly post-edit those raw English outputs with Grammarly to develop their EFL writing assignments.

Standards and Indicators in Basic Education Core Curriculum B.E. 2551 (A.D., 2008)

Strand 2: Language and Culture

Standard F2.2: Appreciation of similarities and differences between language and culture of native and Thai speakers and capacity for accurate and appropriate use of language

FL 2.2 / Grade 11-12 / 1. Explain or compare differences between the structures of sentences, texts, idioms, sayings, proverbs, and poems in foreign languages and the Thai language.

Objectives

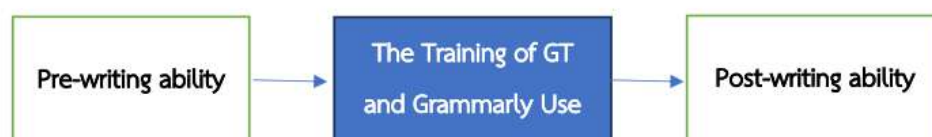
Terminal Objectives

- 1) Students will be able to identify translation errors from raw Google Translate outputs.
- 2) Students will be able to post-edit those translation errors with Grammarly.
- 3) Students will be able to create correct sentences by using Google Translate with Grammarly

Enabling Objectives

- 1) Students will be able to classify translation errors from their raw Google Translate outputs into seven categories of types of translation errors.
- 2) Students will be able to post-edit those translation errors with Grammarly, given the post-editing level at the sentence level.
- 3) Students will be able to use Google Translate to render Thai sentences into English sentences and correctly post-edit those GT raw outputs with Grammarly as a proofreading tool.
- 4) Students will be able to use Google-Translate-Grammarly post-edited sentences to do EFL writing assignments.

This instrument will be used in the training of Google Translate and Grammarly Use according to a theoretical framework for this study.



Part 1 Instructional Period's lesson plans				
Are the Instructional Period's lesson plans relevant to the standards and indicators from Basic Education Core Curriculum B.E. 2551 (A.D.2008) for upper secondary students?				
Items	Rating			Suggestions
	-1	0	1	
1. Students will be able to explain or compare differences between the structures of sentences, texts, idioms, sayings, proverbs, and poems in foreign languages and the Thai language regarding the Instructional Period's lesson plans.	/			1. The lesson plans are designed for a three-hour training session, making it challenging, if not impossible, to cover multiple text genres. You may consider narrowing the scope of genres included in the study. 2. Objectives 3–5 largely depend on the students' existing English proficiency, as the training primarily focuses on using the applications rather than on language structure.
2. Students will be able to classify translation errors from their raw Google Translate outputs into seven categories of types of translation errors regarding the Instructional Period's lesson plans.			/	
3. Students will be able to post-edit those translation errors with Grammarly, given the post-editing level at the sentence level regarding the Instructional Period's lesson plans.		/		
4. Students will be able to use Google Translate to render Thai sentences into English sentences and correctly post-edit those GT raw outputs with Grammarly as a proofreading tool regarding the Instructional Period's lesson plans.		/		
5. Students will be able to use Google-Translate-Grammarly post-edited sentences to do EFL writing assignments regarding the Instructional Period's lesson plans.		/		

Part 2 Overall Evaluation			
1. The instructional period's lesson plans suit Upper Secondary students.		/	
2. All the materials in the instructional period's lesson plans are appropriate and relate to the students' familiar situations.		/	
3. All the instructional period's lesson plans can help students render Thai sentences into English sentences using Google Translate and correctly post-edit those raw English outputs with Grammarly for developing their EFL writing assignments.		/	See comments below.

Additional comments:

1. Lesson objective(s) should be included in each lesson plan.
2. Since the training session is limited to three hours, it is difficult for the teacher to clearly explain and for the students to analyze all error types, especially word choice and professional terms that exceed their background knowledge). You may consider reducing the number of error types in the practice for practicality.

Expert 2's signature

Expert 2

Expert

__13_ / __12_ / __24_

STC.4800/0730

13 December 2024

Subject: Invitation to be our IOC (Item Objective Congruence) expert

Dear Expert 3

King Mongkut's University of Technology North Bangkok

Miss Nicha Niruttipong student number 6407476, a student in the Master of Education (Bilingual Education) who has already completed her coursework and thesis proposal defense on 30 April 2024. Her research is entitled "Implementing the Use of Google Translation with Grammarly to Enhance Thai Upper Secondary School Students' English Writing Ability". Currently, she is in the stage of collecting and analyzing data Assoc. Prof. Dr. Sumalee Chinokul is her advisor.

Miss Nicha Niruttipong has finished designing her research instruments. Thus, the college would like to invite you to validate these instruments. The package has been attached herewith.

I truly appreciate your kind support in this matter and hope that you will accept my invitation.

Sincerely yours,



Assistant Professor Anchalee Chayanuvat, Ed.D.

Program Director of Bilingual Education

Suryadhep Teachers College

Rangsit University

Evaluation Form of Item Objective Congruence
Students' Perception of Using Grammarly Questionnaire in
the Pre- and Post-writing Ability Tests.

Instructions

Please evaluate to what extent congruence exists between the objectives and the following items by putting a tick (✓) in the box where the score agrees with your opinions. Please also provide suggestions if necessary.

Score Descriptions

- 1 means the objectives and the items are **congruent**.
- 0 means the objectives and the items are **questionable**.
- 1 means the objectives and the items are **incongruent**.

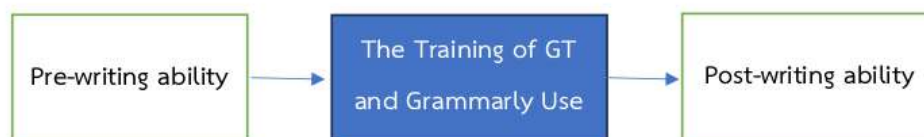
Objective of the Instrument

To determine the behaviors of Grammarly use among Upper Secondary students at Kawila Wittayalai School Chiang Mai for the 2023 academic year in the pre- and post-writing ability tests.

Description

In this study, the Students' Perception of Using Grammarly Questionnaire has been developed both in English and Thai based on O'Neill & Russell (2019) and Rejeki S. (2023). It will elicit upper secondary students' responses regarding students' perceptions of their proficiency in using Grammarly for academic writing. The researcher uses a closed-ended questionnaire in the form of a Likert scale. The statement consists of 5 answer choices: strongly agree, agree, neutral, disagree, and strongly disagree. Students only choose one option based on their views. The questionnaire adapted by O'Neill & Russell (2019) consists of 3 indicators of students' perceived knowledge of using Grammarly.

This instrument will be used in the pre- and post-writing ability tests according to a theoretical framework for this study.



Part 1 Students' Perception of Using Grammarly Questionnaire					
Is the Students' Perception of Using Grammarly Questionnaire appropriate for getting students' responses to examine their behaviors of Grammarly use?					
Sections		Rating			Suggestions
		-1	0	1	
Part 1 General information about Grammarly				✓	
Part 2 Grammarly Use's Questionnaire Aspects					
Aspects	Indicators				
Accepting	Reasons for using Grammarly			✓	
Understanding	Usage of Grammarly			✓	
Evaluating	Strengths and Weaknesses of Grammarly			✓	
Part 2 Overall Evaluation					
1. The Students' Perception of Using Grammarly Questionnaire suits Upper Secondary students.				✓	
2. The scenarios for the Students' Perception of Using Grammarly Questionnaire are appropriate and relate to the students' familiar situations.				✓	
3. All sections of the Students' Perception of Using Grammarly Questionnaire can elicit students' responses regarding their perceptions of their proficiency in using Grammarly for academic writing				✓	

Additional comments:

1. Just to double-check, will the questionnaire be implemented before the end of the 2023 academic year? If not, the year in the questionnaire my need to be adjusted.

Thank you for your time and cooperation.

Expert 3's signature

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Expert

29 / 11 / 2024



Evaluation Form of Item Objective Congruence

Purposes and Attitudes in Using GT Questionnaire in the Pre- and Post-Writing Ability Tests

Instructions

Please evaluate to what extent congruence exists between the objectives and the following items by putting a tick (✓) in the box where the score agrees with your opinions. Please also provide suggestions if necessary.

Score Descriptions

- 1 means the objectives and the items are **congruent**.
- 0 means the objectives and the items are **questionable**.
- 1 means the objectives and the items are **incongruent**.

Objective of the Instrument

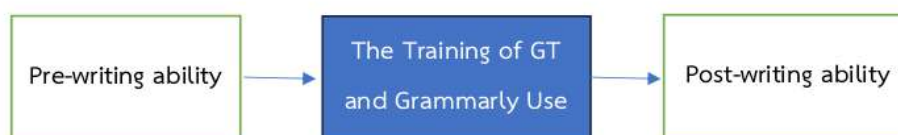
To examine purposes and attitudes towards using Google Translate (GT) for English language learning among Upper Secondary students at Kawila Wittayalai School Chiang Mai, the 2023 academic year in the pre- and post-writing ability tests.

Description

In this study, the Purposes and Attitudes in Using GT Questionnaire has been developed both in English and Thai based on Sukhwan A. (2014) & Chompurach W. (2021). It will be used to elicit Upper Secondary students' responses regarding students' purposes of GT use for English learning, attitudes, benefits and drawbacks, and problems and solutions when using GT. Questionnaire items are created based on literature review and related studies. The questionnaire contained five sections: general information of the participants, purposes of GT use for English learning of GT users, attitudes towards the use of GT, general comments on benefits and drawbacks of GT, and problems and solutions in using GT. There are general comments about

benefits, drawbacks, issues, and solutions to using GT, which are open-ended questions at the end of this questionnaire.

This instrument will be used in the pre- and post-writing ability tests according to a theoretical framework for this study.

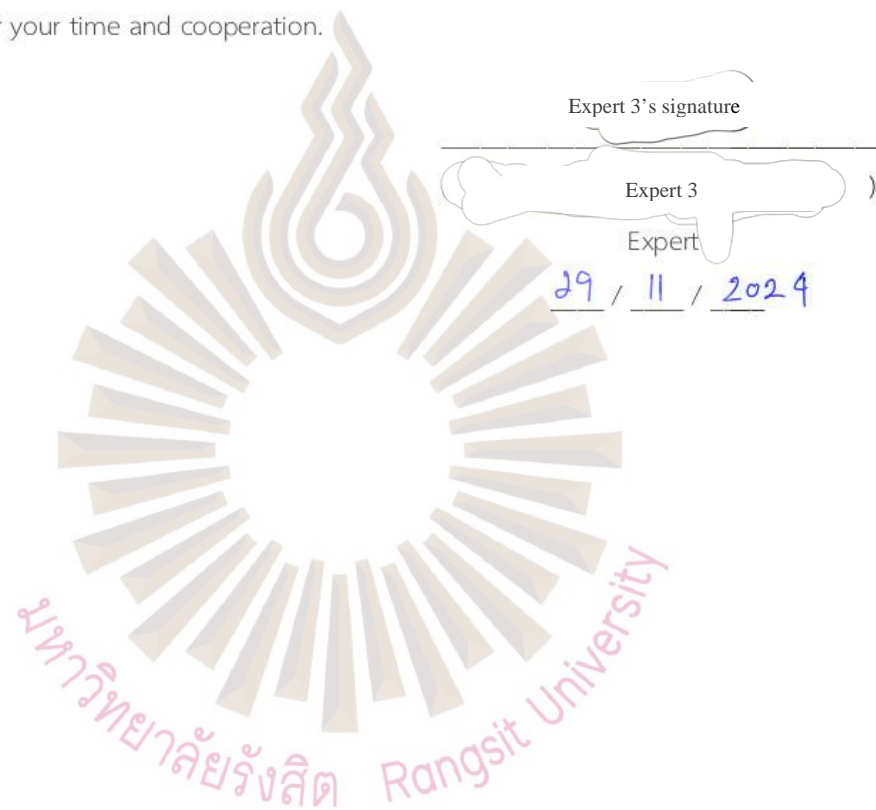


Part 1 the Purposes and Attitudes in Using GT Questionnaire				
Is the Purposes and Attitudes in Using GT Questionnaire appropriate to get students' responses due to examine their purposes and attitudes?				
Sections	Rating			Suggestions
	-1	0	1	
1. General information			✓	
2. Purposes and frequency of GT use			✓	
3. Attitudes towards using GT			✓	
4. General comments about GT			✓	
5. Problems found when using GT and solutions			✓	
Part 2 Overall Evaluation				
1. The Purposes and Attitudes in Using GT Questionnaire is suitable for Upper Secondary students.			✓	
2. The theme for the Purposes and Attitudes in Using GT Questionnaire is appropriate and relates to the students' familiar situations.			✓	
3. All sections of the writing task can elicit students' responses regarding writing errors of Google Translate use from Thai to English for Upper Secondary Thai students			✓	

Additional comments:

1. Respondents often left the open-ended section blank as they didn't know what to write about. To ensure that the respondents provide specific information that you need, I suggest using questions in the open-ended section would give the respondents some context and better elicit more focused responses. For example, advantages section could be change to "What are the advantages you've experienced when using GT? Please specify."

Thank you for your time and cooperation.



Evaluation Form of Item Objective Congruence

Instructional Period's lesson plans in the training of Google Translate and Grammarly Use

Instructions

Please evaluate to what extent congruence exists between the objectives and the following items by putting a tick (✓) in the box where the score agrees with your opinions. Please also provide suggestions if necessary.

Score Descriptions

- 1 means the objectives and the items are **congruent**.
- 0 means the objectives and the items are **questionable**.
- 1 means the objectives and the items are **incongruent**.

Objective of the Instrument

To train upper secondary students at Kawila Wittayalai School Chiang Mai about using Google Translate with the Grammarly application for the 2023 academic year in the training of Google Translate and Grammarly Use.

Description

In this study, the researcher has developed the instructional period's lesson plans based on these goals and objectives.

Goals and Objectives of Instructional Periods

Goals: At the end of the training, students will be able to render Thai sentences into English sentences using Google Translate and correctly post-edit those raw English outputs with Grammarly to develop their EFL writing assignments.

Standards and Indicators in Basic Education Core Curriculum B.E. 2551 (A.D., 2008)

Strand 2: Language and Culture

Standard F2.2: Appreciation of similarities and differences between language and culture of native and Thai speakers and capacity for accurate and appropriate use of language

FL 2.2 / Grade 11-12 / 1. Explain or compare differences between the structures of sentences, texts, idioms, sayings, proverbs, and poems in foreign languages and the Thai language.

Objectives

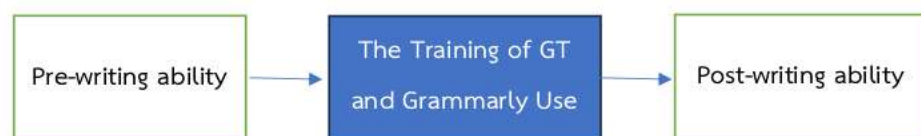
Terminal Objectives

- 1) Students will be able to identify translation errors from raw Google Translate outputs.
- 2) Students will be able to post-edit those translation errors with Grammarly.
- 3) Students will be able to create correct sentences by using Google Translate with Grammarly

Enabling Objectives

- 1) Students will be able to classify translation errors from their raw Google Translate outputs into seven categories of types of translation errors.
- 2) Students will be able to post-edit those translation errors with Grammarly, given the post-editing level at the sentence level.
- 3) Students will be able to use Google Translate to render Thai sentences into English sentences and correctly post-edit those GT raw outputs with Grammarly as a proofreading tool.
- 4) Students will be able to use Google-Translate-Grammarly post-edited sentences to do EFL writing assignments.

This instrument will be used in the training of Google Translate and Grammarly Use according to a theoretical framework for this study.



Part 1 Instructional Period's lesson plans				
Are the Instructional Period's lesson plans relevant to the standards and indicators from Basic Education Core Curriculum B.E. 2551 (A.D.2008) for upper secondary students?				
Items	Rating			Suggestions
	-1	0	1	
Students will be able to explain or compare differences between the structures of sentences, texts, idioms, sayings, proverbs, and poems in foreign languages and the Thai language regarding the Instructional Period's lesson plans.		✓		There are currently no sessions dedicated to comparing Thai and English sentence structures. You could initiate this discussion by asking them to identify linguistic/ structure differences after they finished the translated race during the introduction of the 1 st lesson plan. From your lesson plans, it seems that students are given limited opportunities to practice editing their translation. Therefore, including sentence editing practice sessions in 2 nd and 3 rd lesson plans may help them improve this skill.
Students will be able to classify translation errors from their raw Google Translate outputs into seven categories of types of translation errors regarding the Instructional Period's lesson plans.			✓	
Students will be able to post-edit those translation errors with Grammarly, given the post-editing level at the sentence level regarding the Instructional Period's lesson plans.		✓		
Students will be able to use Google Translate to render Thai sentences into English sentences and correctly post-edit those GT raw outputs with Grammarly as a proofreading tool regarding the Instructional Period's lesson plans.			✓	
Students will be able to use Google-Translate-Grammarly post-edited sentences to do EFL writing assignments regarding the Instructional Period's lesson plans.		✓		

Part 2 Overall Evaluation				
1. The instructional period's lesson plans suit Upper Secondary students.			✓	
2. All the materials in the instructional period's lesson plans are appropriate and relate to the students' familiar situations.			✓	
3. All the instructional period's lesson plans can help students render Thai sentences into English sentences using Google Translate and correctly post-edit those raw English outputs with Grammarly for developing their EFL writing assignments.		✓		While they can render sentences, they need more practice editing their sentences based on feedback provided by Grammarly.



Additional comments:

1. In the first lesson plan, during your presentation on Google Translate and Grammarly, you may need to provide short practice sessions to allow students to experiment with those tools. Although Google Translate and Grammarly may be commonly used; hands-on practice may help promoting students' familiarity more.
2. In the first lesson plan, you may need to specify the length of the paragraph when asking them to write a paragraph about their dream date.
3. To ensure that students can post-edit texts, consider provide practical exercise after completing lesson plans number 2 and 3. You can ask them to edit their 'dream date' paragraphs written in the 1st lesson period. If they can classify types of errors and can edit their own paragraph correctly, it is a proof that they demonstrate full understanding, and your enabling objectives number 3&4 will be fulfilled.

Thank you for your time and cooperation.

Expert 3's signature

(Expert 3)
Expert
29 / 11 / 2024
มหาวิทยาลัยรังสิต Rangsit University

Evaluation Form of Item Objective Congruence

Post-Training Questionnaire after the training of Google Translate and Grammarly Use

Instructions

Please evaluate to what extent congruence exists between the objectives and the following items by putting a tick (✓) in the box where the score agrees with your opinions. Please also provide suggestions if necessary.

Score Descriptions

- 1 means the objectives and the items are **congruent**.
- 0 means the objectives and the items are **questionable**.
- 1 means the objectives and the items are **incongruent**.

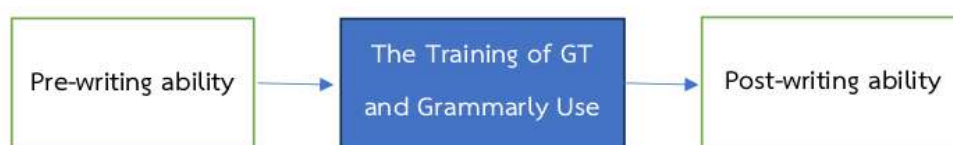
Objective of the Instrument

To determine the feelings, thoughts, or ideas of upper secondary students at Kawila Wittayalai School Chiang Mai about the benefits and improvements of EFL writing after the training of Google Translate's use with Grammarly for the 2023 academic year.

Description

In this study, the Post-Training Questionnaire has been developed in English and Thai based on Knowles (2021). It will elicit upper secondary students' responses regarding their perceptions after participating in the training on using Google Translate with Grammarly and what they are willing to do once they have completed the training.

This instrument will be used after the training of Google Translate and Grammarly Use according to a theoretical framework for this study.



Part 1 The Post-Training Questionnaire				
Is the Post-Training Questionnaire appropriate for getting students' responses to examine their feelings, thoughts, or ideas about the benefits and improvements of EFL writing after the training of Google Translate's use with Grammarly?				
Sections	Rating			Suggestions
	-1	0	1	
1. General information about the training activities			✓	
2. Perceptions of Google Translate Use with Grammarly			✓	
Part 2 Overall Evaluation				
1. The Post-Training Questionnaire suits Upper Secondary students.			✓	
2. The scenarios of the Post-Training Questionnaire are appropriate and relate to the students' familiar situations.			✓	
3. All sections of The Post-Training Questionnaire can elicit students' responses regarding their perceptions after participating in the training on using Google Translate with Grammarly and what they are willing to do once they have completed the training			✓	

Evaluation Form of Item Objective Congruence

Online Student's Thai-English Translation Worksheet In Pre- and Post-Writing Ability Tests

Instructions

Please evaluate to what extent congruence exists between the objectives and the following items by putting a tick (✓) in the box where the score agrees with your opinions. Please also provide suggestions if necessary.

Score Descriptions

- 1 means the objectives and the items are **congruent**.
- 0 means the objectives and the items are **questionable**.
- 1 means the objectives and the items are **incongruent**.

Objective of the Instrument

To investigate Kawila Wittayalai School Chiang Mai upper secondary student's translation errors from Thai to English used in the pre- and post-writing ability tests for the 2023 academic year.

Description

Regarding Pojprasat (2007) and Wongranu (2017) errors in the translation model, where Thai EFL students took a session on the topic of translation between Thai and English using machine translation, the errors were categorized into two types: syntactic and semantic. Syntactic errors had the highest frequency, implying that the students usually made grammatical errors when translating. Semantic errors had the second highest frequency. In the meantime, Tongpoon-Patanasorn & Griffith (2020) indicated that 15 types of translation errors were encountered in 54 academic abstracts from Thai to English produced by Google Translate. The researcher combined two instruments in Table 1.1, which shows the results of error types in the form of frequencies found in students' academic abstract translations categorized by syntactic and semantic errors

and the percentage of the errors provided. All translation error types are divided by colour-code keys in Grammarly: red, blue, green, and purple.

Table 1.1 below shows the types of errors encountered in the 54 academic abstracts translated from Thai to English by Google Translate, categorized by syntactic or semantic errors, and color-coding keys in Grammarly (Pojprasart, 2007; Wongranu, 2017; Tongpoon-Patanasorn & Griffith, 2020; Drolet, 2023)

Error Types	Explanation	Number of Instances	Percentage
Capitalization (Syntactic)	Either missing or unsuitable capital letters	234	20.58
Punctuation (Syntactic)	Missing or misplaced full stops, commas, semicolons, colons, or quotation marks	227	19.96
Fragment (Syntactic)	Incomplete phrases or missing clauses, subjects, verbs, or objects	185	16.27
Wordy/Unclear (Semantic)	Too many unnecessary words or unclear phrases that convey incomprehensible meaning	91	8.00
Preposition (Syntactic)	Missing or misuse of prepositions or prepositional phrases	67	5.89
Word Choice (Semantic)	Variety of vocabulary used to express a clear meaning	63	5.54
Reference (Semantic)	Isolated word or phrase with no connection to previous or subsequent ideas	49	4.31
Determiners (Syntactic)	Missing or misuse of definite or indefinite articles, quantifiers, numbers, and possessives	47	4.13
Repetition (Syntactic)	Word or phrase repeated with no obvious purpose	42	3.69
Verb Form (Syntactic)	Misuse of or unsuitable verb tense, voice, phrase, clause or case	27	2.37

Noun Agreement (Syntactic)	Count or non-count noun or plural agreements	24	2.11
Word Form (Syntactic)	Incorrect part of speech	23	2.02
Sentence Structure (Syntactic)	Missing, incorrect, non-sequential sentence components	22	1.93
Pronoun (Syntactic)	Incorrect pronoun; misuse of or missing relative pronoun	21	1.85
Conjunction (Syntactic)	Incorrect or missing conjunction	15	1.32
Total		1137	100

Color-coding Keys In Grammarly

Correctness In Red underlined helps you improve spelling, grammar, and punctuation. Examples of Correctness errors are confused words, incorrect noun numbers, wrong or missing prepositions, faulty verb tense, incorrect verb form, comma misuse, faulty subject-verb agreement, misplaced words or phrases, punctuation in compound or complex sentences, misspelled words, misuse of semicolons, quotation marks, etc., determiner use (a/an/the/this/etc.), and pronoun use.

Clarity In Blue underlined makes your writing easier to understand. Clarity errors include unclear sentences, wordy sentences, unclear paragraphs, hard-to-read texts, passive voice misuse, and intricate texts.

Engagement In Green underlined suggests changing words to make your writing more effective and interesting. Examples of Engagement errors are word choice and fluency.

Delivery In Purple underlined helps you use the right language register (academic and formal writing). Delivery errors include inappropriate colloquialisms, tone suggestions, and incomplete sentences.

The research instrument used to investigate the participants' translation errors from Thai to English is taken from Thai articles in the Jamjuree Journal of Chulalongkorn University as clippings. The researcher developed the tests consisting of 8 Thai article clippings adapted to be appropriate for the participants' level (Pojprasat, 2007). When the Thai clippings are translated into English via Google Translate, only 10 out of 15 Tongpoon-Patanasorn & Griffith's Error Types are detected, including Punctuation, Unclear, Preposition, Word Choice, Reference, Verb Form, and Conjunction. This means that Google Translate Artificial Intelligence or AI in 2024 is much more syntactically and semantically developed than in 2020. When users request an Adaptive Translation of Google launched in February 2024, it imports the text to be translated and a small dataset of translated examples of as many as 30,000. The findings included Google Adaptive Translation outperforming old Google Translate with an up to 23% increase in quality (Google Cloud, 2024).

Table 1.2 below shows 10 types of errors, which are highlighted in yellow rows encountered in the 12 Thai article clippings from Thai to English by Google Translate, categorized by syntactic or semantic errors, and color-coding keys in Grammarly (Pojprasart, 2007; Wongranu, 2017; Tongpoon-Patanasorn & Griffith, 2020; Drolet, 2023)

Error Types	Explanation	Number of Instances	Percentage
Capitalization (Syntactic)	Either missing or unsuitable capital letters	234	20.58
Punctuation (Syntactic)	Missing or misplaced full stops, commas, semicolons, colons, or quotation marks	227	19.96
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Word Choice (Semantic)	Variety of vocabulary used to express a clear meaning	63	5.54
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Conjunction (Syntactic)	Incorrect or missing conjunction	15	1.32
Total		1137	100

Color-coding Keys in Grammarly

Correctness in Red underlined helps you improve spelling, grammar, and punctuation. Examples of Correctness errors are confused words, incorrect noun numbers, wrong or missing prepositions, faulty verb tense, incorrect verb form, comma misuse, faulty subject-verb agreement, misplaced words or phrases, punctuation in compound or complex sentences, misspelled words, misuse of semicolons, quotation marks, etc., determiner use (a/an/the/this/etc.), and pronoun use.

Clarity in Blue underlined makes your writing easier to understand. Clarity errors include unclear sentences, wordy sentences, unclear paragraphs, hard-to-read texts, passive voice misuse, and intricate texts.

Engagement in Green underlined suggests changing words to make your writing more effective and interesting. Examples of Engagement errors are word choice and fluency.

Delivery in Purple underlined helps you use the right language register (academic and formal writing). Delivery errors include inappropriate colloquialisms, tone suggestions, and incomplete sentences.

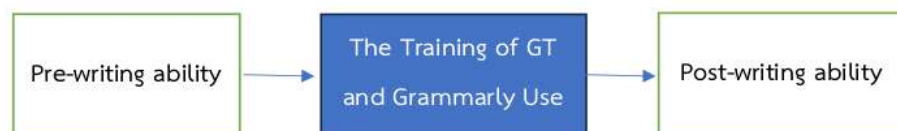


The researcher designs the table in Figure 1 by summarizing the essence of Table 1.2 together. Therefore, this table is equipped to categorize all detected Google Translate translation errors and put those in 4 highlighted and underlined colors in Grammarly.


Highlighted & Underlined Colors in Grammarly	<u>Red</u>	<u>Blue</u>	<u>Green</u>	<u>Purple</u>
Detected Translation Errors from Google Translate	Punctuation Preposition Determiners (Article) Verb Form Noun Agreement Pronoun Conjunction	Wordy/Unclear Reference	Word Choice	Polite/Professional

Figure 1 The main table of Detected Translation Errors from Google Translate and Highlighted & Underlined Colors on Grammarly

This instrument will be used in the pre- and post-writing ability tests according to a theoretical framework for this study.



Part 1 Online Student's Thai-English Translation Worksheet														
Is the title clear?														
Items	Rating			Suggestions										
	-1	0	1											
Title: Online Student's Thai-English Translation Worksheet			✓											
Are the instructions clearly described?														
<p>Instructions: Complete this form with 8 assigned clippings by correctly following the instructions attached to each item. When encountering errors in translation in Google Translate text, indicate which type of translation error is based on the table below, along with <u>red</u>, <u>blue</u>, <u>green</u>, and <u>purple</u> highlights, bolds, and underlines as determined by Grammarly. — correct translation errors in the Grammarly outputs as many rounds as needed until there are none.</p>	✓			<p>Since your participants are upper secondary students, they may find long and complex instructions difficult to understand. To make it easier for them, you can try breaking down the instructions into simpler steps.</p>										
Is the table of Highlighted & Underlined Colors in Grammarly and Detected Translation Errors from Google Translate appropriate and easy to use?														
The table:			✓											
<table border="1"> <thead> <tr> <th>Highlighted & Underlined Colors in Grammarly</th> <th>Red</th> <th>Blue</th> <th>Green</th> <th>Purple</th> </tr> </thead> <tbody> <tr> <td>Detected Translation Errors from Google Translate</td> <td> Punctuation Preposition Determiners (Article) Verb Forms Noun Agreement Pronoun Conjunction </td> <td> Wordy/Underline Reference </td> <td>Word Choice</td> <td>Polite/Professional</td> </tr> </tbody> </table>	Highlighted & Underlined Colors in Grammarly	Red	Blue	Green	Purple	Detected Translation Errors from Google Translate	Punctuation Preposition Determiners (Article) Verb Forms Noun Agreement Pronoun Conjunction	Wordy/Underline Reference	Word Choice	Polite/Professional				
Highlighted & Underlined Colors in Grammarly	Red	Blue	Green	Purple										
Detected Translation Errors from Google Translate	Punctuation Preposition Determiners (Article) Verb Forms Noun Agreement Pronoun Conjunction	Wordy/Underline Reference	Word Choice	Polite/Professional										

Is the blank space appropriate for pasting 8 article clippings and easy to use?				
Items	Rating			Suggestions
	-1	0	1	
<p>The blank space:</p> <p>The Article Clipping # (Number 1-8)</p> 			✓	
Is the title of number 1 clear?				
<p>Title: 1. Translated text by Google Translate via Google Lens</p>			✓	
Are the instructions of number 1 clearly described?				
<p>Instructions: Use your Google Translate application to translate Thai text into English using Google Lens. Copy and paste the English text below.</p>		✓		Can we just say – Use Google Lens to translate the Thai text into English. Copy and paste the translated text below?
Is the title of number 2 clear?				
<p>Title: 2. Grammarly correctness and rephrasing in round #1</p>			✓	
Are the instructions of number 2 clearly described?				
<p>Instructions: Paste the translated text by Google Translate in Number 1 on the Grammarly Application. When encountering errors in translation in Google Translate text, indicate which type of translation error is based on the table below, along with red, blue, green, and purple highlights, bolds, and underlines as determined by Grammarly.</p>		✓		1. Overall instructions are understandable; however, making them more concise could lessen students' confusion.

				2. Should students fix the errors in the text, or just identify them? If students need to edit the text (by themselves) too, it may be necessary to repeat the instruction or provide a space for the edited text.
Are the titles of detected translation errors round #1 in number 2 clear?				
Items	Rating			Suggestions
	-1	0	1	
<p>The titles in colors:</p> <p>Detected translation errors in round #1</p> <p>Correctness Errors (Red underlines):</p> <p>Clarity Errors (Blue underlines):</p> <p>Engagement Errors (Green underlines):</p> <p>Delivery Errors (Purple underlines):</p>			✓	
Is the title of number 3 clear?				
Title: 3. Grammarly correctness and rephrasing in round #2			✓	
Are the instructions of number 3 clearly described?				
<p>Instructions: Paste the Grammarly post-edited outputs round #1 on the Grammarly Application. When encountering errors in translation in Google Translate text, indicate which type of translation error is based on the table below, along with red, blue, green, and purple highlights, bolds, and underlines as determined by Grammarly.</p>			✓	Similar comment to the previous section. Do students need to edit the text by themselves too?
Are the titles of detected translation errors round #2 in number 3 clear?				
The titles in colors:			✓	

<p>Detected translation errors in round #2</p> <p>Correctness Errors (Red underlines):</p> <p>Clarity Errors (Blue underlines):</p> <p>Engagement Errors (Green underlines): ..</p> <p>Delivery Errors (Purple underlines):</p>				
Are the title of number 4 clear?				
Title: 4. Final Grammarly post-edited outputs			✓	

Are the instructions of number 4 clearly described?				
Items	Rating			Suggestions
	-1	0	1	
<p>Instructions: Paste the final Grammarly outputs from Number 3, which are all correct. The Grammarly Application says, Great Job or Well Done!</p>		✓		Can the highlighted phrase be replaced with 'error-free'?

Part 2 Overall Evaluation				
Items	Rating			Suggestions
	-1	0	1	
1. The test is appropriate to use for examining upper secondary students' writing ability in terms of producing translated text using Google Translate outputs and Grammarly proofread text outputs.			✓	
2. The test format is appropriate.			✓	
3. All the used materials in this test are appropriate.		✓		You may need to justify whether the length and language level of these Thai

			article clippings appropriate for upper secondary students.
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Additional comments:

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Thank you for your time and cooperation.

Expert 3's signature

Expert 3

Expert

29 / 11 / 2024

มหาวิทยาลัยรังสิต Rangsit University

APPENDIX F
CERTIFICATE OF APPROVAL BY IRB



COA. No. RSUERB2024-217



Certificate of Approval
By
Ethics Review Board of Rangsit University

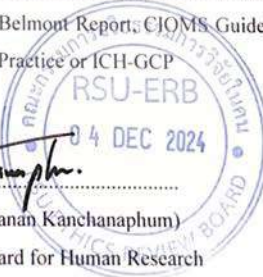
COA. No.	COA. No. RSUERB2024-217		
Protocol Title	Implementing the Use of Google Translate with Grammarly to Enhance Thai Upper Secondary School Students' Writing Ability		
Principle Investigator	Nicha Kitbamrung		
Co - Investigator	Associate Professor Dr. Sumalee Chinokul		
Affiliation	Suryadhep Teachers College, Rangsit University		
How to review	Expedited Review		
Approval includes	<ol style="list-style-type: none"> 1. Project proposal 2. Information sheet 3. Informed consent form 4. Data collection form/Program or Activity plan 		
Date of Approval:	4 December 2024	Date of Expiration:	4 December 2026
		Date of Renewal:	within 4 November 2026

The prior mentioned documents have been reviewed and approved by Ethics Review Board of Rangsit University based Declaration of Helsinki, The Belmont Report, CIOMS Guideline and International Conference on Harmonization in Good Clinical Practice or ICH-GCP

Signature..... *Panan Kanchanaphum*

(Associate Professor Dr. Panan Kanchanaphum)

Chairman, Ethics Review Board for Human Research



The image features a large, faint watermark of the Rangsit University logo. The logo consists of a central flame-like symbol above a circular arrangement of radiating lines. Below the logo, the university's name is written in Thai and English: "มหาวิทยาลัยรังสิต Rangsit University".

APPENDIX G
PERMISSION LETTER

มหาวิทยาลัยรังสิต Rangsit University



วิทยาลัยครูสุริยเทพ วิทยาลัยนานาชาติ มหาวิทยาลัยรังสิต

52/347 ถ.เมืองเอก ถ.พหลโยธิน หลักหก อ.เมือง จ.ปทุมธานี 12000

โทรศัพท์ 02-997-2200 ต่อ 4012, 4019

วันที่ 21 พฤศจิกายน พ.ศ.2567

เรื่อง ขออนุญาตเก็บข้อมูลการใช้โปรแกรม Google Translate ของนักเรียนมัธยมศึกษาปีที่ 4

เรียน ท่านผู้อำนวยการโรงเรียนกวิละวิทยาลัย จังหวัดเชียงใหม่

สิ่งที่แนบมาด้วย จดหมายเรียนถึงผู้ปกครอง เพื่อขออนุญาตเก็บข้อมูลนักเรียนและแบบตอบรับการเข้าร่วมกิจกรรม

ข้าพเจ้านาง นิชา กิจบำรุง นักศึกษาหลักสูตรศึกษาศาสตรมหาบัณฑิต สาขาวิชาการศึกษาระบบสองภาษาและการสอนภาษาอังกฤษ วิทยาลัยครูสุริยเทพ วิทยาลัยนานาชาติ มหาวิทยาลัยรังสิต รหัสนักศึกษา 6407476 ขออนุญาตเข้าไปเก็บข้อมูลการใช้โปรแกรมแปลภาษา Google Translate การใช้โปรแกรมปัญญาประดิษฐ์ Grammarly ของนักเรียนระดับชั้นมัธยมศึกษาปีที่ 4 จำนวนทั้งสิ้น 30 คน เพื่อใช้ข้อมูลเป็นกลุ่มประชากรทดลองตัวอย่างในหัวข้อวิทยานิพนธ์เรื่อง “Implementing Google Translate with Grammarly Instruction to enhance Thai Upper Secondary Students’ English Writing Ability” พร้อมทั้งอบรมนักเรียนเรื่องการใช้เครื่องมือโปรแกรมแปลภาษา Google Translate และโปรแกรมปัญญาประดิษฐ์ Grammarly ให้เกิดประสิทธิภาพสูงสุดเพื่อประโยชน์ของนักเรียนสืบไป

ดังนั้นจึงขอความอนุเคราะห์โรงเรียนกวิละวิทยาลัยเชียงใหม่ เพื่อให้นักเรียนกลุ่มดังกล่าวเป็นกลุ่มประชากรทดลองตัวอย่างและขอใช้สถานที่โรงเรียน เพื่อจัดกิจกรรมการเก็บข้อมูลและฝึกอบรมนักเรียนกลุ่มตัวอย่าง ภายในวันที่ 2 ธันวาคม พ.ศ. 2567 จนถึงวันที่ 13 ธันวาคม พ.ศ.2567 จำนวน 8 ชั่วโมง

จึงเรียนมาเพื่อโปรดพิจารณาและขอความอนุเคราะห์ดังกล่าว

ขอแสดงความนับถือ

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นางนิชา กิจบำรุง

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