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The use and abuse of artificial intelligence-enabled machine translation in the EFL classroom: An exploratory study

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Abstract

The integration of machine translation (MT) and artificial intelligence (AI) has significantly enhanced the precision of MT systems producing translations that rival the quality of skilled human translators. This innovation has broadened the applicability of AI-enabled MT systems attracting users for a variety of purposes. This paper explores the following areas: the application of AI-enabled MT, specifically Google Translate (GT) in English as a Foreign Language (EFL) classroom. Empirical findings and recent research indicate that students are increasingly reliant on MT particularly in higher educational settings where English is not their first language. The purpose of this research is to provide insight on the practices, beliefs and goals of EFL learners who use GT in the classroom. Data was gathered from 234 university students through a questionnaire along with pre- and post-tests to compare the quality of writing drafts created with and without the aid of GT. The findings are consistent with those of previous research conducted worldwide highlighting the immense potential of AI-enabled MT in not only boosting students' learning experiences but also cultivating more independent learners. The study also indicates that students have positive attitudes towards GT and employ diverse search strategies to address various language-related challenges.

Keywords: Artificial intelligence, English as a foreign language, Google translate, Machine translation, Writing.

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Contents

Contribution of this paper to the literature
This study contributes to the literature by examining the under-researched use of AI-enabled machine translation in EFL classrooms. It provides empirical evidence about students' beliefs, practices and purposes for using such tools. The findings offer insights into the potential of AI-enabled MT to enhance learning and foster learner autonomy, enriching our understanding of technology's role in education.

1. Introduction

Foreign language education has gone through several changes and reforms over the past few decades. These changes have increased in quantity as conventional teaching methodologies have been replaced by more modern methodologies. However, artificial intelligence technology has prompted and will continue to cause numerous changes in educational environments. Technology adoption and integration into the classroom have relied mainly on the efforts, convictions and financial resources of educational administrations and at the discretion of educators with students occasionally playing a passive role as users (Stapleton & Kin, 2019).

"The dynamic shifted significantly when students started bringing their personal internet-connected devices such as laptops and smartphones into the classroom environment. This not only transformed the educational landscape but also promoted students to be active participants in the learning process." (Cancino & Panes, 2021). Teachers and educational institutions no longer have control over how students use technology. Learners now enter the classroom with various programmes, websites and applications at their disposal that are accessible through their cellphones. Moreover, educators and researchers have to acknowledge and deal with this disruptive reality.

According to research, machine translation (MT), notably Google Translate (GT) is now the most widely used technical tool in the writing classroom (Tsai, 2022). Students have been using MT for several tasks such as enhancing the acquisition of different language skills in the language classroom. Furthermore, writing appears to be the language competence that students consistently use among the MT four language skills. Technology has not only altered how writing is taught or learned but it has also completely altered how it is evaluated. "Transitioning from traditional pen-and-paper writing to digital platforms that facilitate actions like copying, pasting and text insertion while also providing corrective suggestions and error detection has been revolutionary. The omnipresence of these technologies combined with uninterrupted internet access through smartphones, empowers students to enhance their writing competencies and adopt innovative cognitive strategies."

Learning to write in a foreign language is challenging especially for low-proficiency learners and EFL students often use tools like dictionaries and translators to overcome these challenges. Technology provides easy access to digital resources that can help students write more natural, complex and cohesive texts. However, translation is considered prevented in EFL writing courses by some language instructors and scholars who believe it weakens academic integrity. Indeed, the debate intensifies as translations produced by AI increasingly rival the quality of those produced by skilled human translators." Artificial intelligence and neural network technologies have significantly improved machine translation (MT), enhancing translation quality and accuracy. Google Translate launched in 2006 has been widely used by millions for a variety of purposes. Google released the Neural Machine Translation system (GNMT) in 2016 indicating an improvement in translation quality. Several studies have highlighted GT's potential for producing human-like translations and supporting EFL learners in higher education settings, thus improving the quality and quantity of their written work.

The primary objective of this exploratory study is to understand how AI-enabled machine translation tools are used and potentially misused in EFL classrooms. Specifically, the study aims to:

1. Identify and categorize the ways in which AI-enabled machine translation tools are used in EFL classrooms.
2. Investigate the potential misuse of AI-enabled machine translation tools by EFL students.
3. Understand the consequences of the use and misuse of these tools on EFL students' language acquisition processes.
4. Explore teachers' perspectives on the use and abuse of AI-enabled machine translation in their classrooms.
5. Develop recommendations for the appropriate use of AI-enabled machine translation tools in EFL classrooms.

2. Literature Review

Google Translate is one of the most well-known online translators and machine translation technologies used in the age of digital globalization (Shen & Bai, 2022). These technologies help reduce communication barriers across cultures by providing quick translation in a wide range of languages. These digital technologies have become potential assistance in the field of education, notably in the study of English as a Foreign Language (EFL) and they may be used in addition to conventional teaching strategies. However, there is continuous discussion over the effectiveness of such technologies. This paper aims to explore the role and impact of online translators and machine translation in EFL learning.

2.1. Online Translators and EFL Learning

The term "machine translation" has been largely replaced by "online translation" (OT) or "online translation tools" (OTTs) (Asscher, 2022). Commonly used OTTs include Google Translate, Bing Microsoft Translator, DeepL Translator, ImTranslator and Babylon. Some teachers criticize OTTs for promoting over-reliance on L1, hindering L2 learning and enabling academic dishonesty despite their popularity (Merschel & Munné, 2022). Cook (2010) argues that translation in EFL classrooms benefits learners particularly those with low proficiency.

OTTs have gained popularity over the years due to their availability, speed and accuracy (Sprung, 2000). EFL students are using OTTs which has led to discussion among researchers on how OTT use affects language learning. Lee (2020) supports OTTs attributing past criticism to older. He argues that recent advances in deep learning and artificial intelligence allow for more accurate translations and have helped teachers and students

understand the tools' limitations. Ali et al. (2023) explored the use of online dictionaries by Saudi EFL learners and investigated the extent to which it may develop or impede the learners' translation outcomes. Sixty EFL learners were asked to respond to a 14-question questionnaire in which they had to show their agreement with the statements on a 5-point Likert scale. The findings reveal that most students agree that GT helps them in the translation of different texts and it also develops their vocabulary acquisition as well as their language skills. Moreover, they agreed that GT saves time as compared to the book or manual ones, even though its accuracy is not sufficient and it needs more editing.

Opposing studies discourage the use of OTTs due to their inability to handle idiomatic language and translation vagueness (Stapleton & Kin, 2019). Ducar and Schocket (2018) express concern about the excessive use of OTTs and the avoidance of L2 use without instructor supervision. Some researchers question the fairness of comparing student written work with OTT-generated outputs which require minimal cognitive effort (Somers, Gaspari, & Niño, 2006). These concerns become more significant when learners use OTTs excessively without considering translation inaccuracies (Khoong, Steinbrook, Brown, & Fernandez, 2019).

2.2. Online Translators and L2 Writing

Online translators have a profound impact on L2 writing. They can assist L2 learners by providing instant translations, improving comprehension and boosting learner autonomy (Alharbi, 2023). They can also help learners overcome vocabulary limitations and allow them to express more complex ideas (Cai, Lee, & Swennen, 2021). Numerous studies have examined the effect of OTTs on writing in foreign or L2 languages. Garcia and Pena (2011) conducted a study on 16 college EFL students using GT to explore whether or not the translator could help them develop their writing skills. The researchers implemented a repeated measure design where they asked the participants to first write a paragraph in L2 on a topic they were familiar with without using GT and then write about the same topic in L1 and use GT as needed. The findings of the study suggest that the students were able to communicate their ideas better, write more words and use more complex sentences when they used GT.

"In order for EFL students to optimally use AI-powered machine translation and similar classroom technologies in their writing tasks, it's imperative that they receive appropriate training that teachers should prioritize." O'Neill (2019) recruited 32 college students for his study into three groups: a control group (A), two experiment groups (B and C) and a third group that served as a comparison group to see whether providing instruction on the usage of OTTs would affect the success of MT use in EFL writing classes. No OTT was available to the control group, which was complete. The first experiment group (B) was allowed to use an OTT and the second experiment group (C) was allowed to use an OTT in addition to receiving training on how to use it for improving their drafts. The findings indicate that group C had access to the OTT and received training on it, outperformed both the control and the experiment group B which only had access to the OTT without training. The achievement of the C group was evident in the quality of their writing in terms of spelling, grammar, accuracy and content.

Tsai (2019) conducted a study evaluating the influence of OTTs on 124 Chinese students learning English as a Foreign Language (EFL). Tsai (2019) compared self-written texts by the students, both with and without OTT use, considering parameters such as word count, grammatical accuracy and spelling. The results showed improved proficiency in the texts written with OTT assistance.

Similarly, Puspa, Saputra, and Haryana (2023) examined the reliance of students at the University of Bengkulu, Indonesia, on technology for essay composition. They explored the students' perceptions of the use of such technology especially in the context of academic integrity. Their mixed-method approach involved a closed-ended survey and interviews with English department students enrolled in a critical writing course. The data showed that all participants used OTT for translating words from their native language to English in their essays. However, the opinion on whether this constituted cheating varied depending on the context.

Stapleton and Kin (2019) used mixed-methods research to evaluate the potential of OTTs for language acquisition with the help of 23 participants, including teachers and students. The students wrote argumentative paragraphs in English and Chinese, translated by an OTT (Google Translate) which were then graded by the teachers. Post-study interviews demonstrated favourable sentiments regarding Google Translate as a learning aid, while the researchers stressed the significance of recognizing GT's limits. The teachers who were unaware of the employment of OTT awarded equal or higher grades to the OTT-translated drafts.

Concerns have been raised about the misuse of online translation tools like GT in second language writing, particularly regarding plagiarism and academic integrity (McJunkin, 2022). This highlights the need for responsible use of such tools.

2.3. Powering MT Systems with AI Technology: Google Translate as an Example

Recent developments in machine translation (MT) have allowed MT systems to shift from using only statistical models to incorporating deep learning and AI technology. This has significantly improved the quality and accuracy of the translations and allowed users to access more accurate L2 to a large extent, match the intended meaning they had in their L1 (Tsai, 2019). The warranted criticism against the use of OTTs in the EFL classroom is now irrelevant with the use of the new improved versions of Neural Machine Translation (NMT) that have increased translation precision and consequently enabled language learners to be exposed to meaningful L2 outputs all of which are important components for successful communication in the target language (King, 2019; Levy & Steel, 2015).

When GT was first introduced in 2006, its algorithms were based on the frequency of word pairs which occasionally resulted in translation errors (Urlaub & Dessein, 2022). The introduction of Google's Neural Machine Translation (GNMT) in 2016 significantly improved GT's translation quality, reducing errors by 60% compared to its predecessor and Phrase-Based Machine Translation (PBMT) (Andari, Sofyan, & Yusuf, 2022). GT offers features beneficial for language learning such as instant translation pronunciation aid, access to authentic materials, grammar and syntax comparison, real-time conversation translation, image translation and offline

translation capabilities despite its limitations such as occasional inaccuracies and a lack of contextual understanding (Ammade, Ramadhani, & Rahman, 2023; Wang, Huang, Sun, & Zhang, 2023).

According to the reviewed studies, the use of these tools in the EFL language classroom can be both beneficial and harmful (Pham et al., 2022). However, teachers should be aware of the limitations and drawbacks of OTTs in order to help students avoid these pitfalls. They should also give them proper training and ongoing direction throughout the MT consultation process (Jolley & Maimone, 2022). GT and other OTTs tools can become indispensable tools for enhancing language learning (Groves & Mundt, 2015). The majority of the reviewed studies and the ever-increasing body of literature surrounding the use of MT in the EFL classroom involved participants whose first language was not Arabic. Moreover, few studies that assessed Arab EFL learners' experience with OTTs either looked at MT use from a single dimension or were conducted before Google revolutionized its GT system by integrating AI and ML technologies. The present research project aims to contribute to the area of using AI-enabled MT in EFL writing classrooms in several Saudi universities that use English as a medium of instruction following a more holistic approach involving learners, professors and learning environments.

AI-powered MT systems still face challenges despite the advancements. These include difficulty in translating low-resource languages, handling idiomatic expressions and cultural nuances and maintaining consistency in long texts (Naghdipour, 2023). Moreover, the black-box nature of NMT systems makes it hard to understand and correct errors (Rao, 2022).

3. Research Questions

1. How do Saudi EFL university learners use Google Translate?
2. What are the perceptions of university professors and Saudi EFL learners towards the use of Google Translate for L2 language learning in general and for doing assignments in particular?
3. What is the impact of using Google Translate on:

a. The quality of students' written assignments?
b. The number of errors?
c. The number of complex sentences?
d. Time spent doing the writing task?

4. To what extent are L2 writing teachers able to detect Google Translate use in students' assignments?

4. Methodology

This study explores AI-enabled MT tool used by Saudi university students using a quasi-experimental, repeated-measure design. The aim is to establish a cause-and-effect relationship between writing quality without and with access to Google Translate (GT) as the dependent variable. Participants completed a survey addressing such aspects as frequency, purposes, strategies and perceptions of MT tool use. The second part listed GT search strategies found in recent English as a Second Language or as a Foreign Language ESL/EFL employ various strategies when using MT tools for L2 assignments. Figure 1 illustrates the most commonly used Google Translate search strategies by learners in literature.

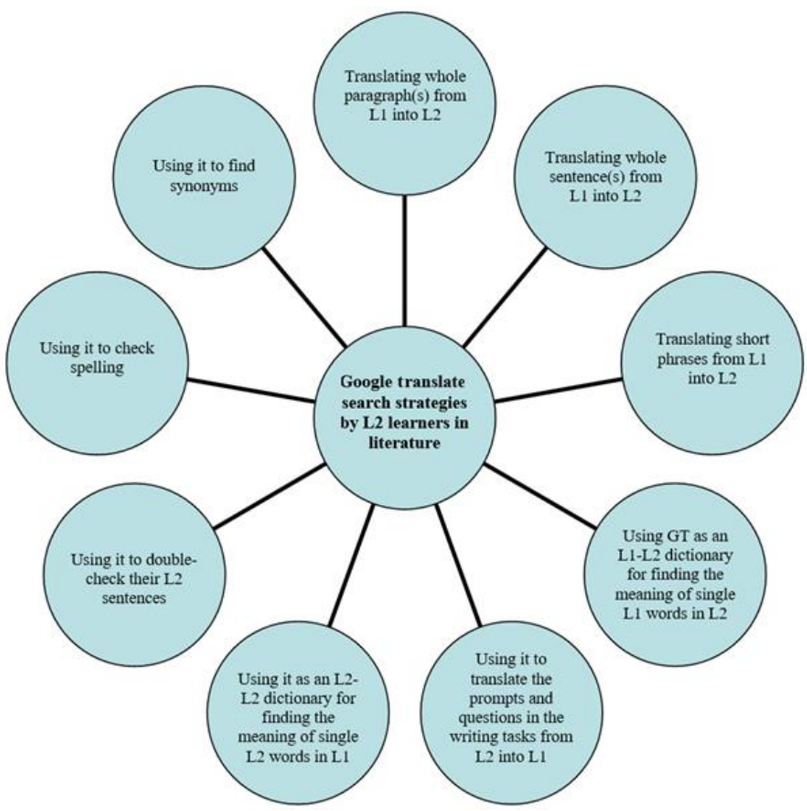

Figure 1. Google translate search strategies by learners in literature.

EFL teachers were given a Yes/No box on students' papers to indicate whether they think the paper in front of them was prepared using Google Translate or not in order to test their ability to recognise the usage of MT in written assignments from students.

4.1. Participants

The participants of this study were 234 male and female students studying at three Saudi higher education institutions that use English as a medium of instruction. All the participants were at the A2 CEFR (Common European Framework of Reference for Languages) level or above.

4.2. The Writing Task

The writing task was to write a 200-250 word essay in English about the causes and effects of obesity.

4.3. Data Collection Procedure

Data were collected between January and February 2021 when classes were suspended because of the COVID-19 pandemic. Through personal networking, the researcher managed to collect data from two universities in addition to the university in which he teaches. An introductory online meeting was conducted with the interested language teachers to explain the research objectives and procedures. The teachers then sent invitations to their students inviting them to voluntarily engage in the study. A link to an electronic research participation consent form was shared with the teachers who then shared it with their students. Out of 362 recipients of the consent form, only 234 students showed great interest in participating in the study. The researcher then contacted the participants through emails they provided in the consent form and invited them to an introductory online meeting to explain the objectives of the study and the accompanying procedures.

4.4. Data Collection Process

The writing task was sent to the students with clear instructions. It was made clear to the participants that they were not allowed to use any resources when writing the essay. They were also provided with a box in which they had to write the time in minutes. The students had been divided into 11 groups and each group was assigned a Google Mail account to which they were required to email their essays using the specified template. They received the identical writing assignment throughout the course of the following three days but they were free to use Google Translate. A total of 468 papers were received which were then given codes for identification. The names were removed from the papers and then forwarded to the teachers to mark. Each teacher received a folder with 40 to 44 papers half of which were written without GT use while the other half relied on GT. The papers of the students were randomly arranged in each folder to prevent teachers from knowing whether a paper was written with GT or without it and to ensure that all of the students' papers were graded by the same teacher. After that, the survey was sent to the students and the data analysis process started. Figure 2 shows the sequence of the data collection process.

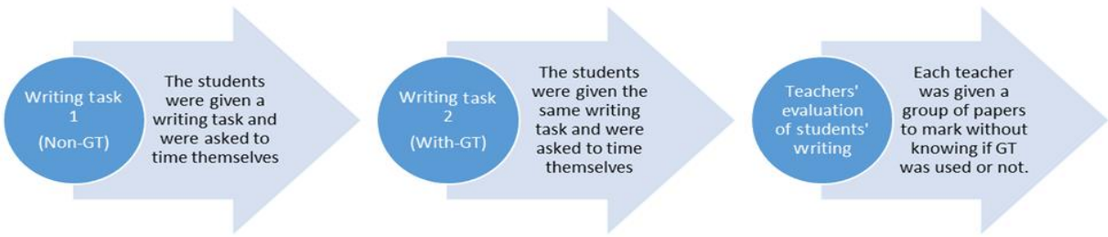

Figure 2. The data collection process

5. Results

5.1. Descriptive Statistics

English language learners use Google Translate (GT) for different reasons in different ways. The present exploratory study aims to shed light on the nature of Saudi university EFL language learners' use of Google Translate as a helping tool when they write in English. The first part of the survey asked the participants this question and provided them with a range of uses based on the findings of other Google Translate studies in the literature. Eight major uses of Google Translate were listed for the purpose of this study. The participants had to read all the uses and respond to each use by answering either "yes" or "no" where "yes" confirmed the use of that specific GT strategy, and "no" confirmed otherwise. Descriptive statistics were used to rank the GTs.

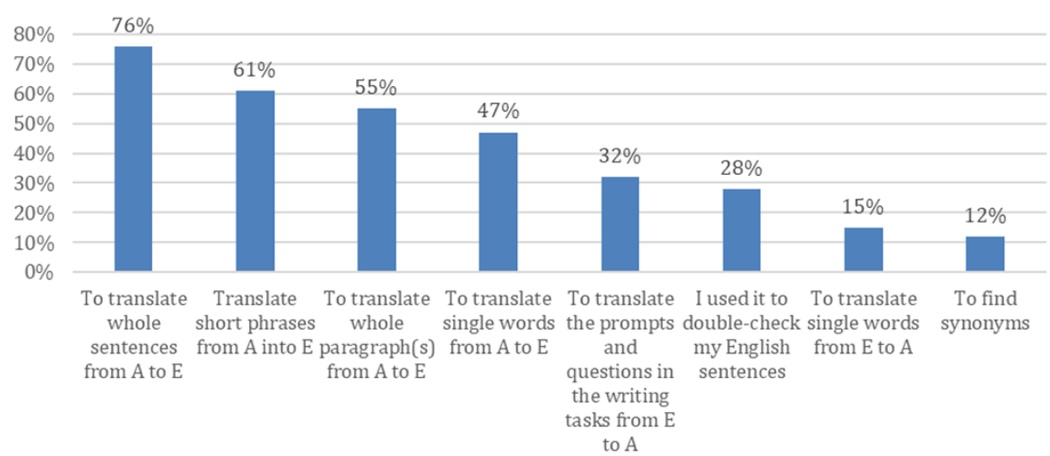

Figure 3. What EFL learners use gt for when writing their assignments in English.

Figure 3 shows that 76% of the participants use Google Translate for translating whole sentences from Arabic into English when they write English texts. The second highest use of GT when writing in EFL was translating short phrases from Arabic into English (61%) followed by using GT for translating complete Arabic paragraphs into English (55%). The results also show that students use GT as a dictionary to find the meaning of Arabic words in English (47%) and to find synonyms for English words (12%). Saudi students also use Google Translate for translating the prompts and questions in the English writing tasks from English into Arabic (32%) to understand exactly what the tasks are asking them to write about.

5.2. Students' Level of Trust in Google Translate

The results of the Likert-scale items related to the level of trust students have in Google Translate are reported in Table 1. The results show that the majority of the students have more trust in GT than in their own translation with 91% disagreed with the statement that they trust their own translation more than that of GT. Almost the same percentage of students (91.9%) agreed that they trust the output of GT for their assignments. The students' responses to the question about their ability to identify the errors in GT on their own (only 17.9% of the students agreed that they are able to find the errors, if any, in a GT output) suggest that they lack confidence in their own language and translation abilities which is evident in their lack of trust in GT. However, the results also show that the students trusted GT in the past (78.8%) and their trust in GT at present is higher (91.9%). This could be attributed to their GT use skills in the past being less developed when compared to their skills today which allow them to refine the GT outputs. It's also possible that they were referring to the time period before 2017 when AI was included in the core of GT, radically altering and vastly enhancing its translations.

Table 1. Survey results (Students' level of trust in google translate)

Item	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean (SD)
	1	2	3	4	5	
If GT makes an error, I am likely to notice it.	23.5	40.2	18.4	9.4	8.5	1.2
	63.7		18.4	17.9		
I trust the accuracy of my own Arabic to English translations more than electronic translations.	0	0	9	44.4	46.6	0.6
	0		9	91		
I trusted the output of GT for English assignments in the past.	0	0	2.6	44.9	52.6	0.6
	0		2.6	97.4		
I trust the output of GT for English language writing assignments.	0	0	8.1	48.7	43.2	`0.6
	0		8.1	91.9		

5.3. Google Translate as a Language Learning Tool

Table 2 shows the results of the survey. The students believe Google Translate may be considered a language learning tool with nearly all students (95%) agreeing with the statement "Google Translate is a valuable English language learning tool". The same thing applies to their opinion regarding the imperativeness of allowing university students to use GT in English writing classes with (98%) agreeing with the statement. In contrast to what many teachers assume about Google Translate, a small percentage of participants in this survey (11%) agreed with the statement "Reliance on Google Translate is detrimental to language acquisition."

Table 2. Survey results (Google translate as a language learning tool)

Item	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean (SD)
	1	2	3	4	5	
The use of electronic translators hinders language learning.	0	0	4.7	38.5	56.8	0.6
	0		4.7	95.3		
Google Translate is a valuable English language learning tool.	10.7	26.1	32.1	21.8	9.4	1.1
	36.8		32.1	31.2		
University students should be permitted to use electronic translators in the English learning classroom.	0	0	0	15.4	84.6	0.4
	0		0	100		

5.4. Recommending Google Translate and Continuing to Use It

Table 3 shows that all students (99.2%) believe that they will continue to use GT for their English assignments. They also unanimously agree that they will recommend using GT to other students (99.2%) indicating a strong attachment to GT and very positive perceptions about it.

Table 3. Survey results (recommending google translate to others).

Item	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean
	1	2	3	4	5	(SD)
I will recommend using GT for the writing assignments.	0	0	0.9	29.1	70.1	0.9
	0		0.9	99.2		
I will keep using GT for my English assignments.	0	0	0.9	38.9	60.3	0.9
	0		0.9	99.1		

5.5. Students' Dependency on Google Translate

Table 4 shows that the majority of students rely on Google Translate when they face difficult English words, phrases, sentences and even whole paragraphs (93.3%). This means that not only they use GT for producing language but they also use it to comprehend difficult written English texts. In response to the item "I do not need to learn to write in English because Google Translate can do the work for me", most of the students did not agree with the statement (92.7% disagree) while only a few students believed they could manage without learning to write in English if they had access to GT (3.8%).

Table 4. Survey results (Students' dependency on Google Translate)

Item	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean (SD)
	1	2	3	4	5	
I do not need to learn to write in English because Google Translate can do the work for me.	0	0	0.9	29.1	70.1	0.5
	0		0.9	99.2		
I rely on Google Translate to interpret difficult English writing.	0	0	0.9	38.9	60.3	0.5
	0		0	99.1		

5.6. The Qualitative Responses in the Survey

Several students contributed further insight into their replies by writing remarks in the allotted places addressing specific subjects as the questionnaire's questions were open-ended A few of these responses were in English while the rest were written in Arabic which the researcher translated into English for this analysis.

In stressing the impact of using Google Translate on students' grades, Student 1 wrote:

> "English is not my greatest strength as I always suffer when I write in English. I used to be nervous before the epidemic when I had to take written tests in English writing classes ENG001 and ENGL002. My score in supervised in-class test was really poor in contrast to my homework scores which were relatively higher since I could use GT at home. My grades have improved despite the fact that we had to do all of our writing at home. Honestly, I wouldn't have made it without Google Translate".

Another example of student input regarding the use of GT in English assignments after evaluating and editing the translation output, student 2 provided an interesting insight by writing:

> "Despite the fact that my teachers have always prohibited using Google Translate in the classes or as a source of help for home assignments, I have always used it and got away with it. I am good at using GT and know how to edit the translations to make them look like my own work".

In an attempt to justify the legitimacy of using GT as a helping tool for language learning, student 3 added:

> "Teachers consider relying on GT for accomplishing our tasks to be a type of cheating. In real life, we may use a variety of instruments to assist us do our tasks which is acceptable". When officials and politicians travel overseas to see or communicate with their colleagues in other countries, do they not use interpreters? Is that considered cheating?"

Student 4 commented:

> "Google Translate is a great invention. I don't only use it in English classes or for doing English assignments. I also use it for other subjects and it is great. When I study or prepare for other subjects, I have to read many pages written in English in the textbook. All I have to do is take a photo of the entire page with my smartphone and Google Translate will instantly translate it for me. It only takes seconds unlike before when I had to type each word individually into the translator. I also use it when I write my assignments or prepare presentations for those courses. I know the language. The work I'm doing isn't mine but it's absolutely my thoughts expressed in my language."

Table 5. A comparison between students' non-gt written assignments and the gt-based assignments in terms of writing scores, number of errors, number of complex sentences and the time spent completing the writing tasks.

Paired samples test									
		Paired differences					**t**	**df**	**Sig. (2-tailed)**
		Mean	**Std. deviation**	**Std. error mean**	**95% confidence interval of the difference**				
					Lower	**Upper**			
Writing score	Writing task1: Scores (out of 100) (Without google translate) Writing task2: Scores (out of 100) (With google translate)	26.94	14.30	0.935	25.09	28.78	28.81	233	0.000
Number of errors	Writing task1: Number of errors (Without google translate) Writing task2: Number of errors (With google translate)	-21.63	12.41	0.793	-25.46	-21.15	-26.61	233	0.000
Number of complex sentences	Writing task1: Number of sentences with more than one clause (Without google translate) Writing task2: Number of sentences with more than one clause (With google translate)	-17.56	15.99	1.046	-19.62	-15.50	-16.79	233	0.000
Time spent completing the task	Writing task1: Time spent [in minutes] (Without google translate) Writing task2: Time spent [in minutes] (With google translate)	-20.75	8.97	0.586	-21.91	-19.60	-35.39	233	0.000

Four separate criteria were used to compare EFL learners' writing outputs with and without Google Translate in order to assess the influence of using Google Translate on their writing. The criteria are the writing score, the number of errors, the number of sentences that have more than one clause and the time spent completing the tasks. The paired comparison of before and after intervention (with and without Google Translate) shows significant changes. Table 5 shows the writing task scores have increased by an average of 26.94 marks after the intervention (with Google Translate) and this improvement is statistically significant ($p<0.001$). A significant improvement ($p<0.001$) was also observed in the reduction in the number of errors (from an average of 30.74 down to 13.79 errors when Google Translate was used). The use of GT in task 2 also resulted in the production of significantly more compound and complex sentences (from 59.26 to 86.21). The time spent completing the writing task also dropped from an average of 55.80 minutes to 35.04 ($p<0.001$). However, there was also a marked decrease in the number of sentences with one or more clauses ($p<0.001$). Finally, the use of GT has improved the quality of students' writing by reducing the number of errors and the time spent completing the writing task.

Table 6. EFL writing teachers' ability to detect Google Translate use in students' assignments

Paper type	Number of papers	Teachers' guesses		Success rate	Failure rate
		Right guess	Wrong guess		
Without Google translate papers	234	226	8	96.6%	3.4%
With Google translate papers	234	45	189	19.3%	80.7%

Teachers were not notified whether the papers they were grading belonged to the Google Translate group or the non-Google Translate group when they were asked to mark students' written tasks. Their task was just to mark the papers, underline the errors and tick a yes or no box to indicate if the paper in hand was written using Google Translate or not. Table 6 indicates that teachers were able to make 226 right guesses and 8 wrong guesses (3.4% failure) when marking the non-Google Translate papers (8 papers were wrongly labeled as "Google Translate"). However, when they marked the Google Translate papers (n=234), they failed to correctly guess Google Translate use at a failure rate of 80.7% (189 papers were wrongly labeled as "non -Google Translate").

6. Discussion

Research Question 1: How do university Saudi EFL learners use Google Translate?

The study shows that Saudi ESL university students frequently use Google Translate for assignments in English and other courses. They generally use it to translate full sentences, short phrases and longer writings from Arabic to English, implying that they rely on the technology for language production in writing. Students find Google Translate useful in generating complicated documents in English especially when their L2 competency is below the needed level for academic accomplishment.

The findings reveal that students are still engaged with the tool and use it without hesitation, despite the fact that using Google Translate as a helping tool for translating sentences and longer texts from Arabic into English when writing assignments is prohibited at universities to which the participants belong. This could be attributed to the novel and unique situation of the COVID-19 pandemic since classes were suspended and students had to work from home with little or no control from their teachers over how they did their assignments or what tools they consulted. Google Translate outputs can easily pass a plagiarism detection tool which is the only examining tool that teachers use before accepting students' submitted work.

The other reported less frequent uses of Google Translate seem to be dictionary-related uses where students use it as an online dictionary. Despite the fact that Google Translate is not a dictionary, it's possible that students valued the ease of having one place to go for all of their linguistic requirements in an effort to avoid interruptions from switching between resources and to save time. Students use Google Translate to double-check their own written language.

On the other hand, student 2's input regarding her use of Google Translate despite her teachers' rejection of it gives another example of students' insistence and determination to use Google Translate regardless of what their teachers think of the tool or the regulations against its use. The more the students are aware of the limits and shortcomings of Google Translate outputs, the more likely they are to process them and produce human-like language output that passes expert human raters. Language teachers do not like this search technique. However, modifying and processing Google Translate results before using them verbatim may be beneficial for language acquisition. Participating in GT output exposes language learners to a multitude of linguistic and syntactic material that they read, reuse, assess and probably alter. This search approach appears to be more pedagogically feasible when compared to the use of GT without any cognitive processing of the result. Many studies suggest using this search technique while interacting with MT output in EFL contexts (Clifford, Merschel, & Munne, 2013; Garcia & Pena, 2011; Jolley & Maimone, 2022).

Students do not appear to comprehend the reason for prohibiting Google Translate, despite professors' best efforts to prevent them from using it while writing assignments. Student 3 tried to legitimize using Google Translate in educational settings by using an analogy comparing it with some official settings like news reporting and international delegations. Teachers might be able to control Google Translate use in educational institutions by imposing strict policies and penalizing its use. However, when students work independently and complete their tasks at home, these constraints are unlikely to apply outside of educational facilities. Instead of wasting time and effort trying to unsuccessfully deter students from using Google Translate, it is probably wiser to either change the way students are assessed where all assessments take place in controlled and supervised settings or change the type of assessments by incorporating online tools and consultation exercises where students need to find different sorts of information and process the findings in a way that involves cognitive processing of the search findings for better language learning. It is a safe policy to have when students are increasingly relying on such tools not only in foreign language classrooms but also in other subjects for language comprehension.

Research Question 2: What are the students' perceptions about the use of Google Translate for L2 language learning in general and for English writing in particular?

Figure 4 illustrates that the questionnaire results show participants' positive attitudes towards Google Translate as a language learning tool and source for assignments. However, most students reported being unable to notice errors in translations which could be due to their insecurity about language proficiency or prior success with using Google Translate. Students disagreed with the idea that Google Translate could replace the need for learning how to write in English indicating they still value language learning. Teachers' ability to detect Google Translate use in students' assignments is explored further in the study.

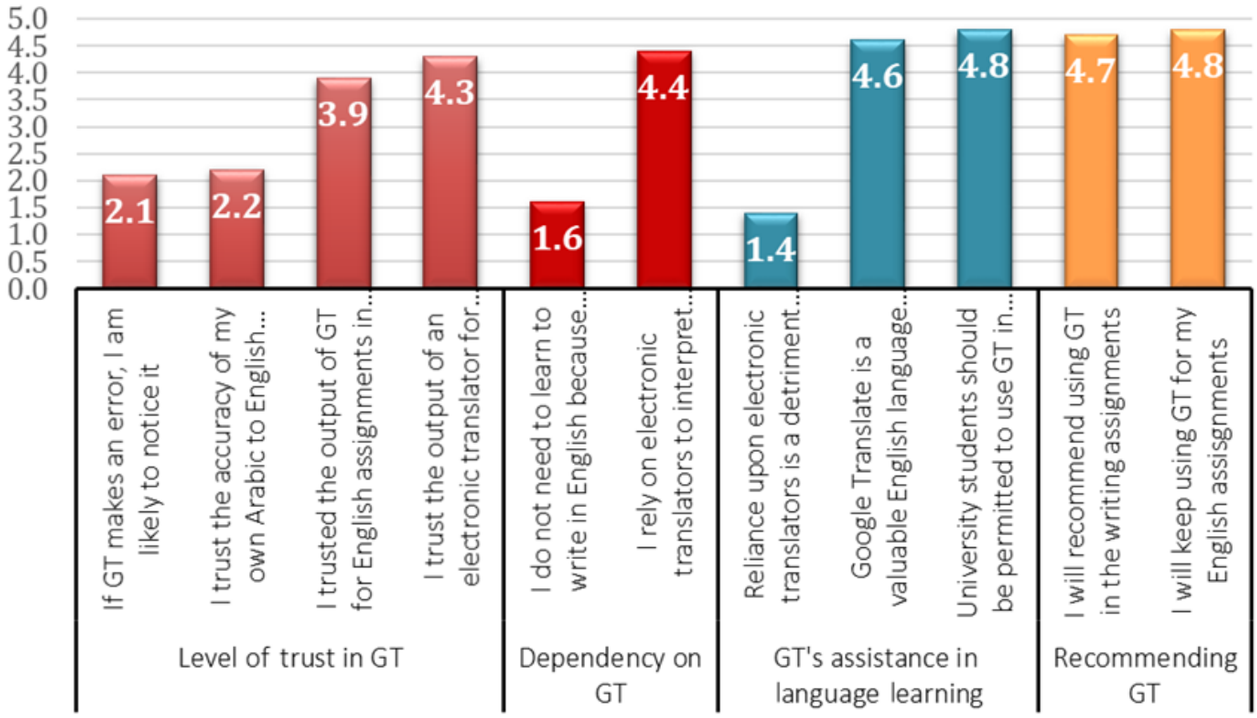

Figure 4. The perceptions of English language learners about the use of GT for L2 language learning

When it comes to the students' qualitative replies, they provide additional information that aids in understanding the nature of GT use as well as the motivations behind their choices, usage and perceptions. The remarks by student 1, when attributing his success in one of his previous courses to Google Translate ("I wouldn't have made it without GT") reveal that behind students' attachment to Google Translate is always a success story. Low L2 proficiency students have a number of challenges that impede their academic development because English is the language of instruction at practically all Saudi Arabian colleges. Hence, students will probably benefit from the availability of a linguistic tool like Google Translate since it gives them hope and encouragement.

Research Question 3: What is the impact of using Google Translate on students' writing quality, number of errors, number of complex and compound sentences and time spent completing the writing task?

Students use Google Translate for different purposes to help them produce improved written texts that are better than the texts they would normally produce without using Google Translate. However they may feel or think about Google Translate, the best way to know how this tool has affected their ability to produce written language is to compare their written outputs objectively with and without it. The results of the comparisons reveal that when students use Google Translate, they produce significantly better texts that have fewer errors and more complex sentences in a shorter period of time (see Figure 5). These results are in line with van Lieshout and Cardoso (2022); Tsai (2022); Cancino and Panes (2021) and Siregar, Panah, Jaafar, and Adisaputera (2021) with the findings of the questionnaire in which the students showed strong agreement with the statements related to the role that Google Translate plays in their language learning, their trust in the tool and their willingness to recommend it and keep using it.

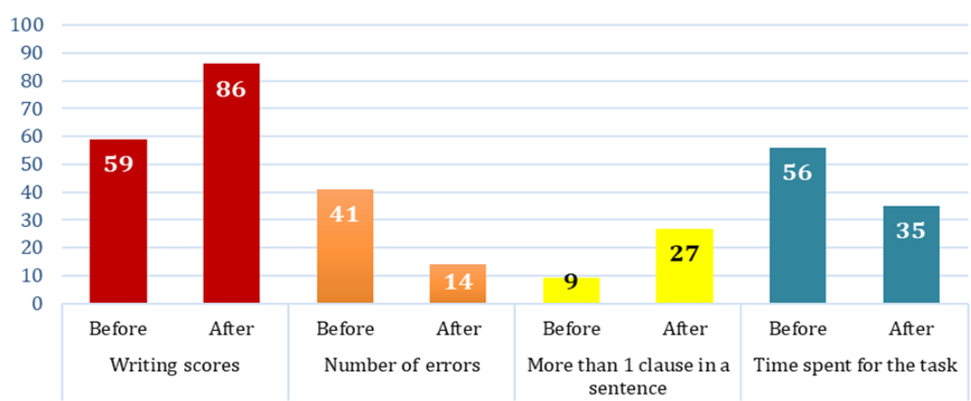

Figure 5. The impact of using GT on students' writing quality, number of errors, number of complex/compound sentences, and time spent for completing the writing tasks.

Research Question 4: To what extent are L2 writing teachers able to detect Google Translate use in students' assignments?

We asked the teacher to estimate whether or not the paper they marked was prepared using Google Translate in order to address student use of the tool when writing in English. In normal educational settings, teachers may detect Google Translate use in either or both of the following ways:

- When a weak student submits high-quality written work.
- When a student submits a written work that reads unnaturally and is full of contextual errors, misplaced words, inaccurate grammar and lexis, ambiguity, transliterations and literal translations.

The translations generated by the upgraded version of Google Translate which uses artificial intelligence are becoming more human-like making it harder for teachers to be alarmed by inaccuracies in the students' written work. As a result, they pass because of the Google Translation screening process. On the other hand, detecting Google Translate use by trying to compare and contrast the quality of the submitted work to a student's actual proficiency level is demanding and time-consuming for many academic professionals who are already overloaded. Teachers are being increasingly overwhelmed by workload which makes it challenging and sometimes impossible to remember every student's proficiency level and then compare the submitted work to that proficiency level. Moreover, if we assume that the teacher eventually managed to spot Google Translate use, the process of further investigating those cases, holding the students accountable and taking the right disciplinary measures would likely be very time- and effort-consuming.

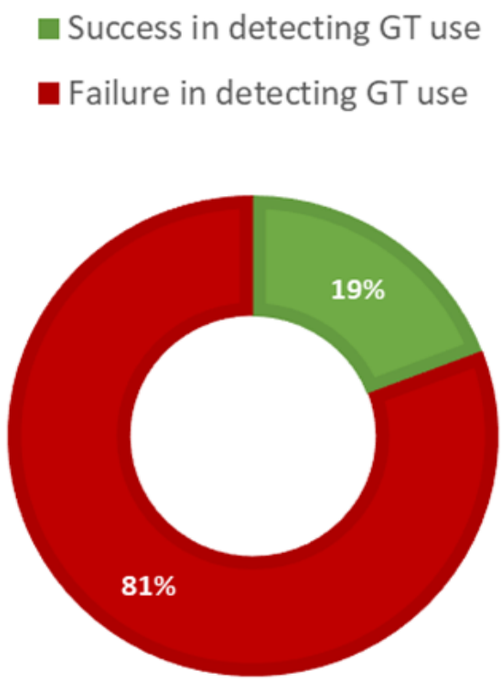

Figure 6. Raters' ability to detect Google Translate use in student's writing

The results of the present study suggest that the majority of teachers failed to detect Google Translate use (see Figure 6) for two reasons:

1. With the use of Google Translate, teachers were unable to determine whether the good papers were written by exceptional students or by poor students since the identities of the students were not revealed when the papers were marked.
2. The Google Translate papers had less language ambiguity and fewer lexical and syntactical inaccuracies making them look like they were written by students and not as translations from L1 to L2.

It is clear that the enhanced functionality of Google Translate which led to translations that resembled human speech assisted some students with low L2 proficiency in meeting the requirements of the writing assignment, assisting students in passing the teachers' Google use check and ultimately assisting students in achieving high scores that they would not have received without Google Translate. This finding is in line with the findings of King (2019); Tsai (2022); Lee (2022) and Kenny (2023) who believe that the criticism that Google Translate received in literature for producing unnatural and substandard translations was true before integrating artificial intelligence technology into the backbone of Google Translate and that the translations produced by Google Translate presently are actually good that they could match the quality of those of expert human translations.

7. Conclusion

This study explored Saudi university students' use of AI-enabled machine translation tools like Google Translate in higher education. Students often translate from Arabic to English to overcome linguistic challenges with increased English language course offerings. The study examined students' usage, perceptions, impact on written outputs and detectability by teachers. Results showed diverse purposes for using Google Translate, positive attitudes towards its use and a significant improvement in the quantity and quality of written work. Moreover, most teachers failed to detect the tool's use in students' submitted work.

"While many educators and second language scholars perceive machine translation systems as valuable resources with the potential to aid language learners in learning the second language, students often hold contrasting views treating these tools as substitutes for their own work. Instead of merely wishing that students would adhere to warnings against using machine translation for assignments and avoid translating from their first

language (L1) to their second language (L2), educators could turn this tendency into an advantage. They could integrate machine translation tools like Google Translate into their teaching approach by designing language learning tasks centered on the tool's search strategies. This might include refining the texts translated by Google Translate or using the tool to review their own writing." The assessment of some learning objectives should be changed and the assignments should be modified so that students can use Google Translate as a scaffolding tool to improve their learning. Reducing the number of home assignments may also be recommended along with replacing them with in-class activities that require group work and peer evaluation that put students under controlled and supervised conditions. It is also recommended that language teachers familiarize themselves with the potential the new generation of AI-enabled MT may bring to their language classes. It is undeniable that every attempt must be made to discourage students from using the new generation of AI-enabled MT to translate longer texts from their L1 to L2 as it is capable of producing translations similar to those of expert human translators and is constantly improving. We need to adopt a policy of openness towards the many disruptive, innovative and transformational technologies that our students are constantly exposed to nowadays. Consequently, education practitioners are advised to learn how to manage the existence of these technologies rather than find ways to block them.

7.1. Limitations of the Study

Although the present study examines a crucial but little-studied aspect of how EFL university students use Google Translate (GT) as a language-assistance tool when writing their English assignments, its generalizability is constrained because participants used GT in the experiment only after being asked to do so rather than being given the option to use it or not. Moreover, a number of variables, including but not limited to the teacher's native language and GT training, affect whether or not EFL teachers are able to recognize the usage of GT in the assignment. Although incorporating the aforementioned variables is beyond the scope of the current investigation, it would be intriguing to investigate this area and see whether it has any impact on the detection of GT use.

7.2. Future Research

It is recommended that scholars and researchers further explore the students' use of machine translation for translating from their L1 to L2 especially those that use artificial intelligence technology in normal settings where they have the choice to use or not to use the MT tool with more educational institutions offering their courses in L2. It would also be interesting to see if training students on different GT strategies will have any impact on their use of the tool or on their perceptions of it. It is advised to conduct further empirical research in this area to see whether developing language learning materials based on GT will result in any learning.

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