Promoting EFL students' reading comprehension, grammatical competence, collocational competence and critical thinking disposition via data-driven pedagogical translation

Dr. Shaimaa Abd El Fattah Ibrahim Torky
Associate Researcher Professor
The National Center for Educational Research and Development

Dr. Nehal Helmi Abd El Gawad Sayed Ahmed
Researcher
The National Center for Educational Research and Development

Abstract

This study explores the effectiveness of data-driven pedagogical translation (DDPT) in enhancing the grammatical and collocational competence as well as the reading comprehension skills of first-year secondary school EFL students. The study also aimed to promote students' critical thinking dispositions. The research investigates the role of translation as a pedagogical tool to address the academic challenge of improving language proficiency among students, particularly in Arab countries. While traditionally viewed as a hindrance in language learning, modern studies highlight translation's potential for enhancing cognitive processes by leveraging the mother tongue in a pedagogical context. The research uses a quasi-experimental design with two groups: an experimental group using DDPT and a control group undergoing conventional instruction. Data was collected through pre- and post-tests assessing grammatical, collocational, and reading comprehension skills, as well as a critical thinking disposition scale. The results demonstrate statistically significant improvements in the experimental group's grammatical and collocational competence and inferential reading comprehension. Furthermore, most critical thinking disposition dimensions improved subsequent to the treatment, compared to the control group. This highlights the beneficial role of pedagogical translation in EFL instruction. The

study suggests that integrating machine-assisted translation and translation activities into the EFL curriculum can significantly support language acquisition and foster deeper cognitive engagement among students.

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Introduction

The field of second or foreign language instruction has undergone several methodologies, each presenting unique advantages and drawbacks, with translation being one of these techniques. Recent research examining the potential impact of translation in foreign language instruction suggests that its role in language learning remains insufficiently delineated (Rossi et al., 2021). From a failure standpoint, translation was heavily used in the conventional Grammar-Translation method, leading to a terrible reputation as an ineffective pedagogical approach (Korosec, 2013; Nguyen, 2024). It was argued that it negatively affected language learning since it compelled learners to view the target language through the prism of their native tongue (Dagilienė, 2012; Soleimani& Heidarikia, 2017, p.2). It was even described by some researchers as "a skeleton in the closet" (Ayachia, 2018, p.188) and has often been regarded as a primary factor contributing to the unfavorable transfer of knowledge from one's native language (L1) to a second language (L2) (Bazani, 2019).

From another perspective, there is wide agreement that language learning is difficult without language learners "noticing" the gaps in their interlanguage system, which is the developing language they produce (Soleimani, & Heidarikia, 2017). Scholars argue that the traditional perspective on translation has neglected the

significance of utilizing the mother language to facilitate the acquisition of a second language (Mutlu -Gülbak et al., 2015; Paz, 2018).

With this in mind, recent research stresses that translation can help in the identification of interference by means of contrastive analysis of both the native language (L1) and the target language (L2) (Boukranaa & Sandy, 2024). The first language is hence considered a "game changer", and many academics argue that completely dismissing translation in EFL contexts is unjustifiable (Leonardi, 2010). Moreover, recent research, based on the connectionist paradigm, has demonstrated an inherent link between the cognitive processes EFL learners employ in their first language and second language (Korošec, 2013; Fortescue, 2014). This underscores the interconnectedness of linguistic systems of both languages in their mind, even though this connection may seem counterintuitive (Vermes, 2010). From another perspective, in modern times, marked by globalization and linguistic diversity, the practice of translation has emerged as an essential skill for enhancing foreign language learning (Gutiérrez, 2018).

Many empirical studies have been conducted to assess whether teaching ESL/EFL using the first language is effective. Bouangeune (2009) showed that students' recollection of new vocabulary was improved by using mother language in teaching vocabulary. In the same vein, Bhooth et al. (2014) and Boustani (2019) concluded that L1 can serve as a scaffolding strategy, thereby improving student engagement and facilitating second language learning. Also, Leonardi (2010) stresses that translation should be used in a systematic and purposeful way to lower students' stress and anxiety and enhance the process of FL learning.

Petrocchi (2014) refers to this as **"pedagogic translation"** (p.95), which is defined as a teaching method that effectively improves EFL skills. Contrary to common belief, pedagogic or "pedagogical" translation encourages students to think more in

English and avoid mental translation (Yulianto, & Setiawan, 2018, p.260). This type of translation should be distinguished from translation pedagogy which aims at training learners on translation for professional purposes (Leonardi, 2010). Yet, although translation has been acknowledged as a pedagogical tool, its efficacy as a cognitive strategy to enhance EFL learners' "noticing mechanisms" is still largely unexplored (Gutiérrez, 2018).

Recently, scholars have paid significant attention to the increasing integration of machine translation (MT) into EFL classes, assessing both its effectiveness and suitability (Asscher, 2022; Lee, 2019; Niño, 2020). Nevertheless, a number of educators have expressed skepticism, arguing that MT technologies may encourage unethical behavior, impede genuine language acquisition, and foster reliance on defective language models (Andari et al., 2022). Moreover, recent literature frequently presents conflicting findings, and there is a noticeable lack of empirical studies that are firmly based on students' actual learning outcomes. (Lee, 2022). Hence the use of MT in EFL instruction requires further empirical investigation.

Context of the Problem

Previous research, especially in the context of Arab countries, has repeatedly highlighted the fact that students face significant challenges in attaining an adequate level of language proficiency, especially with regard to grammatical competence (Algburi & Razali, 2022; Al-Jarf, 2022; Kamenická et al., 2024; Sheerah, & Yadav, 2022). Moreover, some studies have proved that EFL learners are lacking in collocational competence and always make many mistakes (Sipayung, & Saragih, 2023; Torky, 2011). This weakness can primarily be attributed to the fact that collocations do not hinder students' comprehension and thus most probably they go unnoticed (Ginanti, 2020).

Prior research also suggests that EFL students often struggle with understanding reading texts, particularly when it comes to making inferences (Alghonaim, 2020; Hezam et al., 2022; Maizarah, 2018; Rafatbakhsh & Ahmadi, 2023; Ramadhianti &

Somba, 2023; Samiei & Ebadi, 2021). Furthermore, some studies indicated that EFL students generally exhibit unfavorable attitudes toward critical thinking, which affects their ability to practice analysis at a deeper level (Álvarez-Huerta, et al., 2022; Bell, & Loon, 2015; Chan, 2019).

To validate previous results, a pilot study was conducted to investigate the grammatical and collocational challenges that first-year secondary students at Saiza Nabarawi Secondary School for girls in Cairo, Egypt, faced. The research entailed the examination of errors in short written paragraphs by a sample of 20 first year secondary students. It was noticed that students have limited grammatical and vocabulary repertoire that hinder their ability to express themselves effectively in English. For instance, if they wish to convey the meaning " أنا مغرم بشئ ما", the word "like" immediately comes to their minds. While they may identify phrases such as "I'm fond of," "I adore", "I'd rather", they frequently struggle to utilize them effectively. This demonstrates that they are unable to spontaneously generate native-like lexical phrases and structures.

Collocations accounted for a substantial amount of student errors; lexical collocations made up 55% of the total, while grammatical collocations made up 45%. Students' reliance on literal translations from their native tongue often resulted in awkward wording. Students' written paragraphs also contained a number of grammatical errors. About 25% of all grammatical errors were related to conditional structure. Roughly 30% were caused by incorrect usage of modal verbs and past tense forms. Other prevalent issue included incorrect passive constructions (25%), and misconceptions about the use of articles and the distinction between countable and uncountable nouns (20%). This suggests that many students found it extremely difficult to construct grammatically sound sentences.

As part of the pilot study, students also took a reading comprehension test, and the results revealed weaknesses in both

literal and inferential understanding. Approximately 25% of all comprehension errors were linked to trouble identifying explicitly stated main ideas, and identifying specific details. Inferential comprehension was even more challenging. Understanding implicit main ideas accounted for about 30% of comprehension errors, followed by drawing conclusions (25%) and difficulty deducing implicit details (20%).

The pilot study also explored students' attitudes toward critical thinking- using a short version of the critical thinking disposition scale. Students' average score was around 40%, which suggests that they generally have a poor disposition towards critical thinking.

To the researchers' best knowledge, there seems to be little research on using translation as a pedagogical method to enhance students' comprehension of collocations and grammatical competence (Soleimani & Heidarikia, 2017, p.2). Research in this domain has mostly focused on writing skills (Pariente- Beltrán, 2013). The only study that explicitly examines the impact of pedagogical translation on reading comprehension is Boshrabadi's (2014) study. Moreover, there is a scarcity of research that has investigated the utilization of machine-based pedagogical translation (MT) by Arab EFL learners, with the majority of the studies conducted prior to the integration of artificial intelligence into MT systems.

Statement of the Problem

The study focuses on addressing the noticeable weaknesses in grammatical and collocational proficiency among EFL secondary school students, as well as mitigating their challenges in developing effective reading comprehension skills. These challenges are likely linked to the instructional methodologies currently adopted. Moreover, the study highlights the widespread prevalence of students' generally negative attitudes toward critical thinking or what is called "critical thinking disposition". While plausible evidence suggests that pedagogical translation—particularly when combined with machine translation (MT)

techniques—may help address these issues, a considerable gap remains in rigorous research on this topic.

The problem of the study can hence be stated in the following main question:

How can data-driven pedagogical translation (DDPT) translation be used for developing secondary students' school grammatical and collocational comptencies, reading comprhension skills and critical thinking dispositon?

***This main question can be sub-divided into the following sub - questions*:**

1. What grammatical rules, collocations and reading comprension skills are necessary for first year secondary school students?
2. How can a data -baed pedagogical translation intervention be structured to improve first year secondary school students' grammatical competence, collocational competence and reading comprehension skills?
3. To what extent is the proposed intervention effective in developing students' reading comprehension skills,?
4. To what extent is the proposed intervention effective in developing students' targeted grammatical competence?
5. To what extent is the proposed intervention effective in developing students' targeted collocational competence?
6. To what extent is the proposed intervention effective in developing students' critical thinking disposition?

Purpose of the Study

The objective of this study was to evaluate the impact of a proposed data-driven pedagogical translation (DDPT) strategy on the grammatical and collocational proficiency of EFL first year secondary school students. In addition, it aimed to evaluate the efficacy of the proposed strategy in improving their reading comprehension and critical thinking disposition.

Significance of the Study

This study has potential implications for EFL pedagogy, curriculum development, and the overall educational experience of EFL learners. First, the study elucidates the often-misunderstood distinction between translation pedagogy and pedagogical translation; the first focuses on training students for professional translation, while the later highlights the use of translation as an effective tool for teaching English to non-native speakers (EFL). The study also provides significant insights for teachers and curriculum developers on using machine-assisted pedagogical translation to address challenging skills, such as reading comprehension, grammatical accuracy, collocational competence, and critical thinking disposition. Hence, this evidence-based approach might provide the basis for developing a focused and effective teaching strategy that can enhance particular elements of EFL competence. Moreover, the study advocates for a more integrative instructional model—one that combines linguistic competence with the development of higher-order cognitive and analytical skills—through the integration of emerging technological tools.

The Study Hypotheses

The study hypotheses were as follows:

1. There are statistically significant differences between the mean scores of the experimental group on the reading comprehension pre- and post test in favour of the post-test.
2. There are statistically significant differences between the mean scores of the experimental and the control groups on the reading comprhension post-test in favour of the experimental group.
3. There are statistically significant differences between the mean scores of the experimental group on the collocation pre- and post test in favour of the post-test.
4. There are statistically significant differences between the mean scores of the experimental and the control groups on the collocation posttest in favour of the experimental group.

5. There are statistically significant differences between the mean scores of the experimental group on the grammar pre- and posttest in favour of the post-test.
6. There are statistically significant differences between the mean scores of the experimental and the control groups on the grammar posttest in favour of the experimental group.
7. There are statistically significant differences between the mean scores of the experimental group on the pre-and post adminstration of the the critical thinking dispositoin scale in favour of the post adminstration.
8. There are statistically significant differences between the mean scores of the experimental and the control groups on the post - adminstration of the critical thinking dispositoin scale in favour of the experimental group.

Delimitations of the Study

This study was restricted to:

- Two first year secondary school groups (one experimental and one control) in one of the governmental schools in Cairo, Egypt (approximately 30 students each).
- A limited duration for implementing the strategy (almost 3 months).
- Developing only grammatical and collocational competences as well as reading comprehension skills relevant to students' syllabus objectives.
- Developing students' critical thinking disposition.

Definition of Terms

 Reading Comprehension: It is a cognitive complex process in which understanding a text depends much on the past knowledge and experiences of the reader. It entails an interactive interaction between the reader, the text, and the environment (Ismail et al., 2020, p.277). In the current study it is defined as the score the

students obtain on both the literal and inferential sections of the reading comprehension test designed for that purpose.

- **Grammatical Competence**: The ability to identify, comprehend, and generate sentences that are grammatically accurate (Erkulova, 2020). According to this study, it is defined as the score that students achieve on the grammar test that is designed to evaluate their ability to comprehend and make appropriate use of language.
- **Collocational Competence**: It refers to the ability to detect and employ frequent word combinations effectively. These include lexical and grammatical collocations. Grammatical collocations are expressions created by merging a content word (noun, adjective, verb) with a preposition or grammatical construct (e.g., communicate with). Lexical collocation, on the other hand, pertains to the combinations of content words (Bui, 2021; Du et al., 2022) (e.g., do homework). In the current study, it is defined as the score students obtain on the collocation test specifically designed for that purpose.
- **Critical Thinking Disposition:** It is defined as the students' tendency to participate in tasks requiring contemplative, analytical, and critical thinking on their language learning process. Wang and Shen (2022) identify seven distinct dimensions: truth-seeking, open-mindedness, analyticity, systematicity, critical thinking, self-confidence, inquisitiveness, and cognitive maturity. In the current study, it is defined as the score students obtain on the critical thinking disposition scale**.**
- **Data-Driven Learning (DDL):** It is a method that enables learners to identify linguistic principles and patterns by direct interaction with authentic examples, hence enhancing their understanding of language use (Luo, 2016).
- **Pedagogical Translation:** It is an approach that highlights the instructive function of translation in language learning, particularly focusing on enhancing the linguistic competencies of ESL/EFL learners (Galante, 2021)**.**

- **Data-Driven Pedagogical Translation (henceforth DDPT)**: In the current study, it is integrating insights from authentic MT-derived data with translation tasks to enhance learning outcomes through the use of error analysis, post-editing, problem-solving, discovery, and feedback.

Literature Review

Revisiting the Role of Translation in TEFL

Critics of employing translation as a pedagogical approach argue that it is relatively restrictive, as it predominantly emphasises the development of writing and reading skills while overlooking other communicative competencies, such as speaking and listening (Leonardi, 2010). Furthermore, some researchers contend that translation tasks may discourage ESL/EFL learners by prioritising the final outcome rather than the cognitive and linguistic processes that lead to that result (Korosec, 2013). Furthermore, it has been proposed that translation may exacerbate interference from the learners' first language, which could result in persistent errors in the target language (Ayachia, 2018).

Contrary to previous criticism, the incorporation of translation into language teaching has recently gained significant attention for several reasons. Notably, the functional approach to translation has established a constructive relationship between translation practice and FL instruction (Rossi et al., 2021, p. 71). Similarly, The Intercultural Language Teaching framework emphasizes the deliberate utilization of translation to increase learners' linguistic and cultural awareness, hence fostering the relationship between language and culture (Fois, 2020). Moreover, the role of translation as a communication tool is becoming increasingly significant. Recent studies on translation in TEFL-particularly (Skopečková, 2018) and Phat (2022)- highlight the necessity of considering contextual elements and communicative functions when teaching translation.

Although several researchers assert that translation inadequately fosters learners' dependence on their mother language, others maintain that it is an intrinsic cognitive mechanism in foreign language learning, often perceived as an "interior" or "mental" process, that can be hardly avoided (Gutiérrez, 2018, p. 10). Therefore, it is argued that translation exercises may function as an instructional activity that is equally authentic as any other classroom tasks if they are meticulously integrated into FL courses (Leonardi, 2010, p.26).

The increasing significance of translation in language instruction is also linked to a pedagogical shift away from the traditional aim of attaining native-speaker fluency (Leonardi, 2010). Modern research has challenged this viewpoint, deeming it impractical and advocating for a more adaptable language acquisition approach (Cenoz & Gorter, 2020). In accordance with this transition, there has been an increasing tendency to recruit non-native EFL teachers, who frequently contribute valuable bilingual and multicultural perspectives to the classroom (Braine, 2018; Wang et al., 2020). It was claimed that those teachers can demonstrate a more profound understanding of the challenges associated with FL/SL learning (Ayachia, 2018). Within this redefined framework, translation is no longer seen as a crutch but as a strategic tool that acknowledges and enhances learners' existing linguistic resources (Galante, 2021; Gutiérrez, 2018; Mohamed et al., 2021).

Considering previous discussion, modern TEFL theorists and researchers are increasingly acknowledging the significance of translation as a pedagogical tool, even in communicative learning contexts. Pedagogical translation is advocated as tool that helps reinforce cross-lingual comparisons, which enables EFL students comprehend the problems brought on by interference from their L1, as they realize that there is no direct correspondence between the L1 and the L2 (Dagilien, 2012; Priya & Jayasridevi, 2018; Skopečková, 2018). This competence aligns with standard "4.1" of the "National Standards in Foreign Language Education Project", which mandates

that students contrast the language they are learning with their native language (The National Standards Collaborative Board, 2015).

Pedagogical translation also acts as a problem-solving task, prompting students to analyze and evaluate the source text prior to selecting suitable translation procedures (Madoui, 2019). It improves EFL learners' metalinguistic awareness and cultivates critical thinking by enabling students to compare the linguistic structures in L1 and L2 (Boukranaa & Sandy, 2024). Yulianto and Setiawan (2018) argue that this approach should involve more than just presenting translation challenges to EFL learners; it also requires assessing how well they resolve them. Their framework relies on a social constructivist perspective, emphasizing the value of collaborative learning. In this context, the teacher's role shifts from that of a traditional instructor to more of a facilitator, guiding students as they work together to construct meaning and solve linguistic problems (Gonzàlez-Davies, 2016).

Some research studies have established that pedagogical translation can enhance EFL learners' macro skills, such as reading comprehension (Alaboud, 2022; Ayachia, 2018; Raad, 2020). In the same way, translation can play a facilitating role in EFL writing instruction, (Artar, 2018; Balakrishnan & Thangavelu, 2018; Pariente- Beltrán, 2013; Paz, 2018). Translation may also be seen as a communication activity, as students have to discuss various text interpretations and the challenges of conveying meaning across languages, which help develop their speaking and listening skills (Liao, 2006; Ban, 2019). Pedagogical translation can also help enhance linguistic micro skills, including grammar, vocabulary and mechanics (Sok & Han, 2019). For instance, Boustani (2019) proved the effectiveness of drawing EFL learners' attention to semantically comparable words in two different languages, which is called "translation equivalence" (p.3).

As far as intercultural competence is concerned, pedagogical translation enables EFL learners to develop knowledge of culturally specific expressions and discover culturally analogous words or phrases in both the source and target languages (Leonardi, 2010). In the domain of English for Specific Purposes (ESP), research by Kavaliauskienė and Kaminskienė (2007), as well as Boukranaa and Sandy (2024), has demonstrated the positive impact of translation in acquiring the target language by linking course content to learners' existing linguistic knowledge**.**

Nevertheless, it is essential to distinguish between translation into the second language (L2) and the first language (L1) (Leonardi, 2010). Translating into the first language (L1) improves comprehension of (L2) grammar, semantics, and vocabulary. On the other hand, translating into L2 mirrors writing in a L2, which often involves implicit translation from the L1. Researchers propose that clarifying the cognitive processes involved in L2 writing via translation allows FL learners to more adeptly navigate the linguistic disparities between both languages (Alaboud, 2022; Yulianto & Setiawan, 2018).

Regarding cognitive and meta-cognitive learning strategies, Liao (2006) argues that EFL students use translation as a memory device, a compensatory, a cognitive approach, and as a means of expressing their feelings and participating in social interaction. Pedagogical translation is also seen as a crucial tool for implementing individualized instruction; students have the chance to work at their preferred speed and utilize whatever techniques they possess to comprehend the text and translate it (Changjiang and Lianxue, 2005). Kelly and Bruen (2017) found that EFL teachers prefer using students' native language in FL classes to reduce students' anxiety and cognitive load. In the same way, EFL learners see translation as an effective instrument for improving comprehension, retention, and language proficiency (Karimian & Talebinejad, 2013). Moreover, pedagogical translation can help combat avoidance (EFL/ESL students' tendency to refrain from using certain vocabulary or structures) which hinders them from

attaining complexity and developing their interlanguage system (Al-Musawi, 2014).

Yet, despite the importance of pedagogical translation, notably, research on translation within Arabic-speaking contexts has mostly treated translation as a separate discipline, focusing on the development of professional translation competencies rather than its integration into TEFL practices. Some studies have examined the structure of translation courses and collected students' evaluation of their efficacy (Gabr, 2002). Furthermore, research has investigated the strategies EFL students implement in translation (Ahmed, 2019a; Ahmed, 2019b; El-Karnichi, 2024; Muftah, 2022; Solhy, 2002); others assessed ESL/ EFL students' translation skills (Shiyab, 2021). Nevertheless, these studies usually have a narrow focus and do not focus on how translation contributes to achieving broader EFL objectives (Rossi et al., 2021).

Therefore, even while translation pedagogy has made great strides in recent decades, it still lacks a strong empirical foundation to support successful practice (Albrecht et al., 2023; Nguye, 2024). In essence, limited research has investigated the role of pedagogical translation within ESL/EFL contexts, especially in the Arab context.

Translation and Collocational Competence

A collocation is a term used to describe two or more words that usually go together that their cooccurrence cannot be attributed only to chance. It refers to the typical way in which native speakers generally combine words (Du et al., 2022). Collocations are typically categorized into grammatical and lexical types. Grammatical collocations are expressions formed by combining a content word (noun, adjective, verb) with a preposition or grammatical structure to express a specific meaning, such as "interested in." Conversely, lexical collocations comprise solely a mixture of content words. For instance, it is more common to pinpoint a "serious problem" instead of a "severe problem" (Bui, 2021).

Collocational competence is widely recognized as essential for achieving native-like competency in a target language. Mastering collocations help EFL students to use language that sounds natural to native speakers (Ginanti, 2020). Therefore, teaching collocational competence has attracted considerable academic attention in the field of language acquisition. Yet, since collocations often appear arbitrary and are not governed by a set of fixed rules, they pose considerable difficulties for many EFL learners. Thus, without a solid command of collocational patterns, learners may experience limitations in their overall language proficiency, which might hinder their ability to express ideas clearly, comprehend spoken or written texts effectively, and engage in authentic communicative situations (Cao & Badger, 2021)

Due to recognized weaknesses in EFL students' collocational competence, researchers have embarked on examining the compensatory strategies learners use to mitigate these limitations—strategies that often result in awkward or inaccurate word combinations. A common tendency among students is their overreliance on basic or high-frequency vocabulary, which can lead to literal and occasionally clumsy translations from their native language into English. This may result in unclear phrasing, overly literal statements, or redundancy—all reflecting a deficiency in collocational competence (Boustani, 2019).

Therefore, it is proposed that translation can play a main role in enhancing students' collocational competence. Specifically, it has been suggested that translation helps learners identify and modify incorrect collocations that arise from literal translation tendencies (Du et al., 2022). Translation exercises provide learners the chance to perform contrastive analysis, fostering critical reflection on the semantic distinctions between their native language and English (Mahdi et al., 2022). Furthermore, collaborative translation tasks—particularly those enriched with teacher feedback—promote a reflective learning environment in which students can discuss, evaluate, and refine their lexical choices. This approach enhances cognitive engagement, facilitates deeper processing, and supports

long-term retention and more accurate use of collocations (Chang & Yamada, 2021).

Translation and Grammatical Competence

Grammatical competence is one of the four main elements of communicative competence (Ali et al., 2018). A solid grasp of grammar empowers learners to articulate their thoughts with precision and fluency, thereby enhancing their overall communicative competence. Consequently, in formal educational settings, it is essential for EFL instructors to integrate grammar instruction, given its critical function in shaping language usage and providing learners with the necessary framework to construct coherent and meaningful output (Erkulova, 2020).

Nonetheless, despite its significance, research has demonstrated that EFL students persistently encounter difficulties in achieving grammatical competence, primarily due to interference from their native language (Lee, 2014). Hence, it was contended that concurrently comparing the grammatical systems of a learner's first language (L1) and second language (L2) can help in recognizing both structural similarities and differences between the two languages (Ghaiyoomian & Zarei, 2015). In this context, translation functions as a conducive educational method for improving grammatical competence, as it forces learners to critically interact with essential grammatical elements, including word order, article usage, subject-verb agreement, and tense uniformity, when translating texts between their native language and English (Boukranaa & Sandy, 2024).

Encouraging learners to reflect on why specific grammatical structures are perceived as "correct" significantly improves metalinguistic awareness (Skopečková, 2018). An exceptionally efficient technique in this context is back-translation, wherein students translate a text from English into their native language and then translate it back into English. This strategy helps students notice persistent grammatical mistakes they keep making-due to

mother language interference- while also enabling them to better grasp complicated grammatical structures (Arshad et al., 2016). Also, translation tasks give EFL students regular chances to work with different phrase structures in meaningful contexts. This not only improves their grammatical accuracy, but it also helps them to better understand how English grammar functions. Over time, these skills translate into more confident and competent communication (Soleimani, & Heidarikia, 2017).

Translation and Reading Comprehension

Reading is a mentally challenging activity that calls for deep focus and active engagement. Unlike the outdated view that reduces reading to simple scanning or memorization, modern theories see reading comprehension as a socio-cognitive process. This perspective highlights that understanding a text emerges from the ongoing interaction between the reader's schemata or previous experience and the content of the text itself (Hezam et al., 2022).

In this process, analytical thinking is paramount, as readers are required to comprehend both the explicit and implicit meaning of the text. Individuals with inadequate interpretive skills frequently encounter difficulties in deciphering the intended meaning, while proficient readers excel in text analysis and comprehension (Ramadhianti & Somba, 2023). Without these interpretative skills, the intended message may be distorted or misinterpreted (Samiei, & Ebadi, 2021).

Typically, when functioning as readers, SL learners generally prioritize comprehending the text factual content (literal comprehension), yet SL learners who practice translation pay more attention to explore many interpretations of these facts, exploring the text implicit meaning (inferential interpretation) (Bhooth et al., 2014; Boshrabadi, 2014). Thus In line with this argument, research proved that proficiency in EFL reading comprehension can lead to more effective translation (Pham, 2017).

From an alternative perspective, translation functions as an effective tool for improving EFL reading comprehension. It is commonly acknowledged that most EFL learners naturally translate

English texts into their native language mentally while reading.Transforming the usually individual reading process into a collaborative classroom activity can markedly enhance student involvement and enrich their comprehension of the material (Boukranaal & Sandy, 2024). An effective method is to have students collectively translate a paragraph into their mother language. This necessitates their comprehension of the literal meaning of the text while also prompting them to discern the underlying implications and cultural connotations. According to Alaboud (2022), through translation activities, students' progress from mere word recognition to cultivating a deeper, more nuanced comprehension of the text.

Precisely comprehending idioms, metaphors, and other forms of figurative language compels learners to engage in deeper thinking regarding the functionality of language within context. This technique inherently fosters inferential thinking—an indispensable although frequently underdeveloped competency among EFL learners (Kovács, 2018). Therefore, integrating translation into reading instruction enables educators to transform reading from a passive task into an engaging, reflective, and intellectually stimulating endeavour.

Translation and Critical Thinking

Critical thinking is a process of logical and reflective thinking that is centered on the act of making choices based on available information (Zulmaulida et al., 2018). It is possible to divide critical thinking into two independent components: the disposition to engage in critical thinking and the skills necessary to engage in critical thinking. When we talk about the skill component of critical thinking, we are referring to the cognitive abilities that include analysis, assessment, inference, and explanation (Fountzoulas et al., 2019). On the other hand, the dispositional component refers to the attitudes or mindset, that are considered to be supportive to critical thinking (Chen et al., 2020; Wang, & Shen,

2022; Larenas et al., 2024). Although the development of dispositions is crucial to guarantee the application of critical thinking skills (Syahfitri et al., 2019), the focus on the dispositional dimension has emerged relatively recently (Álvarez-Huerta et al., 2022; Sendag, et al., 2015; Wang, & Shen, 2022).

Critical thinking disposition can be characterized by the following traits: inquisitiveness, open-mindedness, systematicity, analyticity, truth-seeking, self-confidence, and cognitive maturity (Wang, & Shen, 2022). Inquisitiveness denotes a person's motivation for acquiring knowledge. Open-mindedness denotes the capacity to embrace many viewpoints and recognize one's own prejudices (Syahfitri et al., 2019). Systematicity refers to the quality of being methodical, well-organized, and diligent in the process of enquiry, while analyticity refers to the process of utilizing logical thinking to address problems and predicting prospective challenges (Bell &Loon, 2015). Truth-seeking is defined as an intense desire to get the most precise information about a particular circumstance via honest and impartial inquiry. Self-confidence means having faith in one's own cognitive abilities. Finally, cognitive maturity is described as the capacity to make prudent and considered judgments (Larenas et al., 2024).

Most critical thinking scales nowadays are mainly focused on either basic cognitive skills or critical thinking disposition. The California Critical Thinking Disposition Inventory (CCTDI) and Yoon's Critical Thinking Disposition (YCTD) are two important measures of disposition towards critical thinking (Larenas et al., 2024)

Basically, the implementation of authentic activities that present students with challenges requiring analytical and critical thinking may contribute to their positive attitudes towards critical thinking (Álvarez-Huerta et al., 2022; Bell & Loon, 2015, p. 120). Hence, this study proposes that critical thinking disposition may be fostered throughout the translation process. During the translation of the source text (ST), students are able to identify critical concepts,

engages in in-depth analysis of the text, conduct comparative analysis between L1 and L2 and grapple with solving various problems at the textual, structural and pragmatic levels. Moreover, the self-reflection process subsequent to translation, can motivate students to contemplate the whole translation experiences, including the skills they have acquired, challenges they have encountered, and potential areas for improvement (Bell & Loon, 2015; Giaber, 2018). As a result, it is anticipated that (DDPT) will enhance the critical thinking disposition of EFL students.

Pedagogical Translation in Practice

Scholars argue that empirical research does not provide a single, consistent way of thinking about translation in the EFL classroom or what it entails (Gutiérrez, 2018). However, in most cases, the process of translation may be divided into three main stages: (a) grasping a thorough understanding of the content of the original text; (b) crafting the translated version; and (c) evaluating the finalized translation for clarity and accuracy (Giaber, 2018, p.260). In essence, pedagogical translation involves four key strategies, as follows:

1.Macroanalysis

The first stage of the translation process is understanding the source material and precisely grasping its meaning. Translators should analyze all aspects influencing meaning at this stage, including text format, context, subject matter, genre, purpose, and audience (Giaber, 2018). Priya and Jayasridevi (2018, p.119) maintain that one method that is generally suggested for increasing student engagement is the organization of small group activities in which students work together on analytical assignments. This kind of analysis not only improves students' ability to comprehend the text but also offers a solid basis for making decisions during translation.

2-Micro Analysis

The subsequent phase is micro analysis, which involves an exhaustive examination of the source text to develop a comprehensive understanding of its vocabulary, grammatical structures, and stylistic aspects. This allows them to make informed decisions regarding the significance of linguistic structures in the target translated text within the new context (Giaber, 2018). By the end of this phase, students would have identified recurring translation issues or challenges in the original text *(Boukranaa & Sandy, 2024).*

3- Written or Oral Translation Commentary

Translation commentary is a pedagogical tool that enables students to reflect on the difficulties encountered during the translation process and the strategies they use to address them, either through written or oral expression (Leonardi, 2010, p. 102). Typically, a standard framework for translation commentary entails an examination of the text's topic, purpose, as well as the contextual factors that influence translation. It also includes addressing linguistic challenges such as grammar, vocabulary, register, idiomatic expressions, and fixed phrases (Laviosa, 2014).

4- Back Translation

Back translation, or "double translation," is a three-step procedure that involves analyzing the source text, translating it into the native language, and then re-translating it back into the original language (Zhang & Gao, 2014, p. 32). Using this method, students are able to identify linguistic distinctions, such as the differences in word order between Arabic and English (Abdelaal, 2020; Mohammadi, 2022).

Machine Translation and Language Learning

Machine translation (MT) is now widely used and has drawn the attention of many researchers (Raad, 2020, p. 63). The phrase "machine translation" has generally been superseded by "online translation" (OT) or "online translation tools" (OTTs) (Asscher, 2022), which have gained a lot of popularity due to the fact that they are easily accessible, have a high degree of accuracy, and are very

efficient (Musk, 2022). For example, Google Chrome web browser and Microsoft Word are presently capable of translating whole pages from one language to another in a moment (Naghdipour, 2023). Through a similar mechanism, the keyboard on mobile devices allows us to include translation functions directly into messaging applications (Ducar & Schocket, 2018, p.780; Tsai, 2019, p.3). This is called "data -based translation" (Darancik, 2016). Regarding EFL learning, it has been suggested that the full rejection of this new technology is impossible since the adoption of any technological tool ultimately depends on human judgment rather than authoritative mandates (Niño, 2020).

Prior to 2017, studies often suggested that the use of MT in FL lessons was to a certain degree effective, however they warned that the technology was far from perfect (Garcia & Pena, 2011; Niño, 2009). Nonetheless, development in machine translation (MT) have enabled the integration of deep learning and AI technologies resulting in an advanced form of MT, called NMT (Neural Machine Translation) (Enríquez Raído et al., 2019; Kirchhoff, 2024). So, previous concerns regarding the use of OTTs in the EFL classroom are no longer applicable (King, 2019; Koehn, 2020).

Researchers have examined the role of MT in enhancing language learning (AlHarbi, 2023; Bahri & Mahadi, 2016; Chandra & Yuyun, 2018; Jabak, 2019; Jolley & Maimone, 2022). Reults demonstrate that MT may promote autonomous learning (Wong & Lee, 2016) and reduce cognitive load (Baraniello et al., 2016). It may enhance FL students' grammatical proficiency (Resende & Way, 2021), reading comprehension (Alhaisoni & Alhaysony, 2017; Wang & Xinli, 2022), and writing skills, including vocabulary, grammar, and spelling (Tsai, 2019). Moreover, it enables FL students to see language as a tool for communication rather than as discrete words or phrases (Enkin & Mejías-Bikandi, 2016). It also creates a low-stress educational milieu that reduces language

anxiety and enhances motivation (AlHarbi, 2023; Bahri & Mahadi, 2016; Niño, 2020).

Despite the benefits mentioned, many educators view machine translation (MT) as a potential threat.Van Rensburg et al. (2012) contend that MT is incapable of generating contextually pertinent translations, notably between morphologically diverse languages such as Arabic and English. Furthermore, MT tools have been criticized for promoting academic dishonesty, plagiarism, and impeding the acquisition of second language (Merschel & Munné, 2022; Stapleton & Kin, 2019).Nevertheless, these worries were addressed by other researchers who proposed that MT might serve as a means to train learners in editing their work and foster self-learning (Raad, 2020, p.65). Therefore, it is imperative to conduct further research to the effectiveness of MT as an instructional tool that supports language acquisition (Enríquez Raído et al. 2019; Lee, 2021).

Incorporating MT in EFL Instruction

In contrast to the widespread belief, academics assert that MT is not expected to be a danger to the process of language acquisition. According to the most recent research, the use of this technology has the potential to revolutionize the way language is taught (Lee, 2022; Li & Deifell, 2013; Ningrum, & Dewi, 2024). Certainly, as students struggle to produce grammatically complicated phrases, they frequently rely on MT to enable them to perform this task. However, they may still feel compelled to check MT output for accuracy, coherence, and quality which requires a deeper understanding of language rules (Groves, 2015, p. 120). Medvedev (2016) and Chandra and Yuyun (2018) concluded that students use Google translate (GT) as a reference tool, notably for learning vocabulary and spelling.

It is also argued the MT will help make the transition from focusing on teaching grammar at the sentence level to emphasizing a deeper comprehension of language functions. Hence, accepting this technology instead of resisting it can help EFL learners to be more critical and active (Tsai, 2019). Moreover, by providing

students with direction on word usage and sentence structures, MT output may help them learn and reduce their need for constant teacher guidance. This is congruent with learner-centered approaches, which encourage more autonomy in language learning (Garcia & Pena, 2011; Tsai, 2019).

The expected rise in the use of MT in EFL classes highlights the need to evaluate its impact on second-language acquisition (Bozorgian & Azadmanesh, 2015; Jin & Deifell, 2013). Educators must develop a thorough understanding of both the benefits and limitations of MT to provide students with effective feedback (Resende & Way, 2021). O'Neill (2019) stresses that EFL students should not be left to their own devices, but rather they should be provided with clear instructions on how to use MT (Valijärvi & Tarsoly, 2019, p. 62). Instead of passively employing MT as in the grammar-translation approach, students should engage in critical linguistic analysis (Enkin & Mejías-Bikandi, 2016; Priya & Jayasridevi, 2018).

In this context, a systematic two-phase translation approach may improve learning. Students should first translate texts autonomously, using their own knowledge. During the second step, students revise their translations utilizing MT to enhance their versions (Enríquez Raído, 2019; Musk, 2022). Moreover, teacher-student writing conferences must follow MT-assisted revisions to provide targeted feedback, hence preventing surface modifications. Teachers should stress that MT may not always accurately reflect the intended meaning, requiring students to take pragmatics and context into account (Ducar & Schocket, 2018, p. 789). This approach is called Machine Translation Post-Editing (MTPE) (Enríquez Raído et al., 2019). Post-editing MT output, as per Niño (2009). MTPE helps in identification of mistakes, fosters linguistic awareness, increases accuracy, exapand vocabulary and promotes fluency in writing. It may be particularly condusive for students with limited proficiency levels, as it allows them to identify

deficiencies in the MT-generated text and discourages habitual overreliance on such tools (Raad, 2020, p. 65).

Pedagogical Translation Framework

In light of previous discussion, pedagogical translation process should include pre-translation, during-translation, and post-translation activities. In the pre-translation stage, a thorough discussion of the text topic is essential. Strategies such as brainstorming relevant ideas, vocabulary preview—where teachers highlight challenging words—and anticipation guides to assess prior knowledge can be employed (Leonardi, 2010). During translation, students should be guided on breaking the text into "translation units"- the smallest meaningful segments of text (Eshtiyaghi & Gilakjani, 2021). Practice is typically conducted in small groups, with feedback from the teacher and peers, in order to optimize opportunity for interaction and learning. Reading comprehension, students' translation, machine translation, back translation and revision comprise the during-translation stage. Finally, the post-translation phase includes comparative analysis, vocabulary expansion, evaluation of human versus machine translation, and self-reflection on the translation process (Giaber, 2018, p.267). At this stage, students need to be encouraged to reflect on their translation experience and systematically record their thoughts at each stage of the translation process to develop their critical thinking skills and attitudes.

Methodology

Design and Sample

The quasi-experimental design called the non-equivalent group design was utlized. It is identical to the pretest-posttest control group/ experimental group design. However, since one can not fully ensure random selection of subjects, a control problem might emerge which makes the use of a pre-test necessary.

The study sample consisted of 62 first-year secondary school students from "Saiza Nabarawi Secondary School for Girls" in Cairo governorate, comprising two inteact classes, during the

academic year 2024-2025. The control group consisted of 30 students, whereas the experimental one consisted of 32 students. T-test results indicated that the two groups had comparable levels of reading comprehension, grammatical and collocational competences at the beginning of the treatment. Moreover, no statistically significant differences were found between both groups in critical thinking dispositoin on the prestest. The lack of statistically significant differences between the two groups in key measures at the prior to the treatment beginning proves that the control and experimental groups were originally homogenous regarding these pertinent academic features. This indicates that any differences after the treatment may be more reliably ascribed to the treatment itself rather than to pre-existing disparities between both groups.

The experimental group was subjected to the data-based pedagogical translation (DDPT) treatment, which involved the use of selected reading texts from stuents' textbook. In contrast, the control group learned the same texts but received regular instruction; i.e., reading the passages and responding to a set of comprehension questions without translating any part to Arabic. In order to ensure that the treatment was consistent, the regular classroom teacher was designated to instruct both groups.

Tools of the Study

The present study made use of the following tools:

- A reading comprehension test
- A grammar test
- A collocation test
- Critical disposition scale

The reading comprehension test

A pre post reading comprehension test was developed by the researchers to assess students' reading comprehension skills. The reading comprehension skills assessed in the test align with those outlined in the students' textbook (Curtis & Hart, 2023) and adhere to the first-year secondary school specifications for the English

Language Exam (First Language) for the 2023/2024 school year, as mandated by the Ministry of Education's directives (National Center for Examinations and Educational Evaluation, 2023). The test comprised two reading texts (200-250 words in length) that have quite the same readability level as the texts in the students' textbook, which ranged from fairly easy to read to easy to read (70-89). The test consisted of 33 items assessing both literal and inferential comprehension skills, as specified by the school curriculum (See appendix A).

Each item whether multiple choice, true/false or matching was scored as correct (1 point) or incorrect (0 point); each short answer item was scored as either correct (1 point), partially correct (0.5) or incorrect (0 point). Spelling and grammar mistakes were overlooked. All corrections were carried out by the researchers.

Test validity and reliability. To measure the test content validity, the first version was submitted to eight TEFL specialists who approved it in terms of content, length and suitability to students' level. The test was also piloted on a sample group of 20 first year secondary school students similar to the study sample. Non-functioning items were removed, and some were modified. In order to establish the test reliability, the test-retest method was used with an interval of two weeks. The reliability coefficient was 0.78. In addition, it was estimated that 45 minutes would provide ample time to complete the test. To estimate test duration, each of the 20 participants was instructed to complete the test under standard conditions while their start and end times were recorded. The average completion time was calculated to be 42.3 minutes (SD = 2.4). To accommodate individual differences and reduce time pressure, the final test duration was set at 45 minutes (i.e., mean + standard deviation). This approach ensured that most participants would have sufficient time to complete the assessment comfortably. The test specification is shown in table 1:

Table 1

The Reading Comprehension Test Specification

Comprehension levels	Reading skills	M.C.Q	Short answer	True / false	Matching	N. Questions		Score
Literal comprehension	**Explicit main idea**	2	-	-	2	4	=15	10.87%
	Specific detail	2	4	5	-	11		25.36%
Inferential comprehension	**Inexplicit main ideas**	-	-	-	2	4		13.04%
	Inferring specific detail	4	-	1	-	6	=18	21.74%
	Guessing meaning of words	-	-	1	8	8		14.49%
	Drawing conclusions	2	-	-	-	2		14.49%
Total		10	4	7	12	33		100%

After proving the test validity and reliability, the pre-test was administered to the experimental group on February 17th, six days prior to the experiment. The post-test was administered on May 14th, three days after the experiment, which ended on May 11th 2025.

The Grammar Test

This study employed a 44-item grammar test as the basic tool for evaluating students' receptive and productive grammatical skills. The test items, designed by the researchers, primarily targeted grammatical structures addressed during the intervention. Yet, other grammatical forms specified in the students' textbook, with a particular focus on topics from the first term, were included to determine whether students could apply acquired knowledge to structures they had not been explicitly taught during the translation process (Curtis & Hart, 2023). The grammatical structures that were

targeted were those identified as particularly challenging by a panel of supervisors and teachers, whose perspectives were gathered through an informal survey.

Number of items for each grammatical area ranged from 3 to 4. The test evaluated both receptive and productive competences. Receptive grammar competence refers to a learner's ability to understand linguistic rules for interpreting written messages, while productive grammatical competence involves the application of these rules to produce accurate written language forms.The test functioned as both a pre-test and posttest. It was used to evaluate the comparability of grammatical knowledge between the control and experimental groups prior to and after the treatment.

To assess the level of students' productive grammatical competence, the following item types were used :

1. **Error Correction Exercises**. Students were provided with a set of sentences that included grammatical errors, and were instructed to locate and correct them. This was helpful in determining how proficient they were in applying grammatical rules .
2. **Transformation Exercises**. Students were required to rephrase certain phrases to evaluate their ability to utilize diverse grammatical structures to convey the same idea.

On the other hand, to assess students **receptive grammatical competence**, the following questions were utilized:

1. **Multiple-Choice Questions (MCQs).** Students were given a set of incomplete sentences and were directed to select the grammatically correct answer from a list of alternatives in order to fill each blank.
2. **Sentence Order Tasks**. Students were given a set of jumbled sentences and were asked to rearrange them in the correct order to assess their grasp of sentence structure.

The targeted grammatical structures and items specified for each are indicated in table (2)

Table 2

Specification of the Grammar Test

Grammar rules	Receptive Grammar		Productive Grammar		Total
	MCQs	Sentence Order	Error Correction	Transformation	
1. Past simple & past continuous	1	1	1	1	4
2. Present simple, present simple passive.	1	1	1	1	4
3. Present perfect	1	1	1	1	4
4. Articles, countable & uncountable nouns	1	1	1	1	4
5. Future Forms (will/be going to/present continuous)	1	1	1	1	4
6. Verbs + infinitive or -ing	1	1	1	1	4
7. Modal verbs (should/shouldn't, must/mustn't)	1	1	1	1	4
8. Zero, first, and second conditionals	1	1	1	1	4
9. Past perfect, past perfect passive, past simple passive	1	1	1	1	4
10. Relative clauses	1	1	1	1	4
11. Modal Verbs of Possibility (can't, might, must)	1	1	1	1	4
Total Number of Questions by Type	11	11	11	11	
Total Number of Questions by category	22		22		44

The version of the test items is in (Appendix B).

Test Validity and Reliability

To validate the grammar test, the first version was given to 8 TEFL specialists to evaluate it in terms of number of items and suitability to the students' level. In addition to content validity, the researcher estimated the test intrinsic validity using the following formula.

Intrinsic Validity = $\sqrt{\text{reliability coefficient}}$ = 0.88.

This value was considered high for the test validity. To establish the test reliability, the test-retest method was employed with an interval of two weeks. The reliability coefficient was 0.77, which is judged to be relatively high.

Piloting the Test

The test was piloted on a group of 20 first year secondary students to determine item difficulty and discrimination. Around 7 items were omitted and 8 were modified. In addition, it was estimated that 60 minutes would provide ample time to complete the test. To estimate test time, each of the 20 participants was instructed to complete the test under standard conditions while their start and end times were recorded. The average completion time was calculated to be 58.9 minutes (SD = 2.1). To accommodate individual differences and reduce time pressure, the final test duration was set at 60 minutes (i.e., mean + standard deviation).

After proving the test validity and reliability, the pre-test was administered to the experimental group on February 17th six days prior to the experiment. The post-test was administered on May 14th, three days after the experiment.

Scoring the grammar test did not require another rater for all test items were almost objective. So all items were corrected as either 1 or 0.

The Collocation Test

The collocations assessed in the current study were primarily drawn from the students' textbook and those addressed with students during the treatment (Curtis & Hart, 2023). Collocations that students often found challenging were chosen based on responses from an informal survey sent to a group of first-year secondary

school teachers and supervisors; fifty-five collocations were selected as the focal point of the study. The assessment of students' understanding of collocations was guided by Gyllstad's (2007) receptive collocation test. The types of questions used were multiple choice questions, gap filling, error correction and translation of short sentences. For all questions, a score of one was given for right collocations, while a score of zero was given for incorrect or omitted responses, half a score was allotted for partly correct collocations. Spelling errors were ignored. The specification for the collocation test is shown in table (3).

Table 3

Collocation Test Table of Specification

Question Type	**Collocations Type**		**Total score**
	Lexical Collocations	**Grammatical Collocations**	
	Number of questions		
Multiple Choice	12	1	13
Gap Filling	7	7	14
Error Correction	2	12	14
Sentence Translation	14	0	14
Total	35	20	55

The version of the examination items is in (Appendix C).

Test Validity and Reliability

To validate the collocation test, the first version was given to 7 TEFL specialists and 4 native EFL teachers to evaluate it in terms of number of items and suitability to the students' level. In addition to content validity, the researcher estimated the test intrinsic validity using the following formula.

Intrinsic Validity = $\sqrt{\textbf{reliability coefficient}}$ **= 0.81.**

This value was considered high for the test validity.

The test was piloted on a group of 20 first year secondary students to determine item difficulty and discrimination. Some items were modified and 5 were deleted. To estimate test duration, each of the 20 participants was instructed to complete the test under standard conditions while their start and end times were recorded. The average completion time was calculated to be 57.4 minutes (SD = 2.13). To accommodate individual differences and reduce time pressure, the final test duration was set at 60 minutes (i.e., mean + standard deviation).

To establish the test reliability, the test-retest method was employed with an interval of two weeks. The reliability coefficient was 0.65, which is judged to be relatively high. After proving the test validity and reliability, the pre-test was administered to both the experimental and control group on February 18th five days prior to the experiment. The post-test was administered on May 15th , five days after the experiment, which ended on May 11th 2025.

Critical Thinking Disposition Scale

In order to measure the students' disposition for critical thinking, a five-point scale was introduced ranging from “totally agree” to “totally disagree”. The scale was translated and adapted from the work of Larenas et al. (2024), initially derived from the California Critical Thinking Dispositions Inventory (CCTDI), by Facione (2000).

The first scale included seven dimensions and twenty-four items; however, it underwent modifications following evaluation by a panel of ten university professors. Based on their recommendations, two more questions were added to dimension 6 of the questionnaire, resulting in a total of 26 items. The number of items in each dimension ranged from 3 to 5. The final instrument had seven dimensions, as follows:

1. **Truth-Seeking**: The tendency to pursue the truth, even if it contradicts one's convictions.
2. **Open-mindedness**: The ability to explore diverse perspectives and maintain openness to new ideas.

3. **Analyticity**: Utilizing logical thinking to address problems and predicting prospective challenges
4. **Systematicity**: Being methodical, well-organized, and diligent in the process of enquiry.
5. **Critical thinking self-confidence**: An individual's faith in their critical thinking capabilities.
6. **Inquisitiveness:** A person's motivation and enthusiasm for acquiring new knowledge.
7. **Cognitive Maturity**: The ability to develop thoughtful judgments that are guided by mature and well-considered viewpoints.

Since the questionnaire was composed of 26 items, and since the maximum score of each item was 5, the total mark of the questionnaire was 130. In order to assess reliability of the scale, the Cronbach's Alpha coefficient was utilized to gauge its internal consistency, yielding a value of 0.82. Table (4) shows the critical thinking disposition scale, including the seven dimensions, number of items allocated to each dimension, and total score assigned for each.

Table 4

Description of the Seven Dimensions of The Critical Thinking Disposition Scale

#	Dimensions	N of items	Total score
1	Truth-seeking	3	15
2	Open-mindedness	4	20
3	Analyticity	3	15
4	Systematicity	4	20
5	Self-confidence Critical Thinking	4	20
6	Inquisitiveness	5	25
7	Cognitive Maturity	3	15
	Total	26	130

The version of the questionnaire is in (Appendix D).

The duration of the scale administration was determined based on a pilot study conducted with a sample of 20 participants from the target population. The average completion time was

calculated to be 18.2 minutes (SD = 1.2). To accommodate individual differences and reduce time pressure, the final test duration was set at 20 minutes (i.e., mean + standard deviation). This approach ensured that most participants would have sufficient time to complete the assessment comfortably. The scale was administered to both the experimental and control group on February 18th five days prior to the experiment. It was also administered on May 15th, four days after the experiment, which ended on May 11th 2025.

Administering and Analyzing the Study Tools

Because there were many tools to administer to students, they were divided into two sessions. The first session was allocated to assessing students' reading comprehension and grammatical competence, while the second session was focused on evaluating students' collocational competence and critical thinking disposition. The first session lasted for 105 minutes, while the second session required 80 minutes to complete the tests. Upon administering the tests to the students, the first step involved analyzing their grammatical and collocational proficiency. The analysis yielded answers to the fifth and sixth research questions. The subsequent phase entailed examining the impact of the intervention on students' reading comprehension, as well as critical thinking disposition to answer the fourth and seventh questions. The comparison was conducted quantitatively by assessing average scores, comparing pretest and posttests students' performance, as well as control and experimental groups' performance on all assessments.

The Treatment

Translation Material and Activities

The texts used in the pedagogical translation treatment were selected from students' textbook (Curtis & Hart, 2023), and so they were mostly engaging and pertinent to their interests. Each text comprised about 250 words and was categorized as either narrative or expository in nature. The texts' readability levels ranged from easy to read to fairly easy to read.

The translation activities students participated in comprised pre-translation, during translation and post-translation exercises. Activities that addressed reading comprehension, grammar, and vocabulary were included in the pre-translation and during - translation phases. Yet, activities such as analyzing, editing, contrastive analysis and reflection were included in the post-translation phase. Each text spanned around 135 minutes as shown in table (5).

Table 5

Activities Practiced During the Treatment

Activities	***Timing***
Pre-Translation Activities:	***15***
1. Brainstorming	2
2. Anticipation guides	3
3. Raising awareness at the word level	5
4. Raising awareness at the syntactic level	5
During Translation Activities:	**65**
1. Reading activities	15
2. Translation	15
3. Revision	10
4. Machine translation	10
5. Back translation	15
Post-Translation Activities:	***55***
1. Comparing machine translation to students' manual translation	15
2. Comparing the back-translated text with original text	15
3. Comparative grammar analysis	10
4. Vocabulary builder	10
5. Self –reflection	5
Total	135

1-Pre-translation phase. The class began with a general overview of the main topic covered by the selected text. Some strategies were used to activate students' prior knowledge on the subject before

reading the text for translation in order to enhance their comprehension. These included the following:

1.1 Brainstorming. Students were instructed to pay particular attention to the title of the text as well as any associated images to activate their background knowledge related to the text topic. This strategy enabled them to integrate the new information with what they already knew about the text subject.

1.2 Anticipation Guides. This technique enabled the assessment of students' prior knowledge about the text. The teacher provided a worksheet containing several statements related to the text's topic and asked students to indicate whether they are true or false. After reading the text, students revisited their initial responses and engaged in discussions with their classmates to reflect on their understanding.

1.3 Raising Awareness at the Word Level. The teacher provided students with a set of Arabic words and collocations and instructed them to translate them into English. Subsequently, the text containing the English translation of the words was distributed and students were requests to locate the words in the text. Students also were directed to record any collocations they could find in the text on their worksheets. They were also familiarized with collocation resources, such as the Corpus of Contemporary American English (https://www.english-corpora.org/coca/).

1.4 Raising Awareness at the Syntactic Level. Students were introduced to key grammatical structures to be used during the translation process of the text. Emphasis was placed on challenging grammatical structures found in the translated text. Moreover, they were introduced to a coding system based on Ferris et al. (2013) to identify and correct main grammatical errors, including verb tense, agreement, prepositions, word order, missing pronouns, run-on sentences, and fragments. Students then had to apply these codes—individually or in pairs—to refine their translations or modify machine translation (MT) output.

2-During Translation Phase (Assigning translation tasks). Students were required to go through five main stages, which were as follows:

2.1 Reading Activities. Students are able to engage more actively in the formulation of meaning by analyzing reading from the perspective of translation, in addition to the traditional reading practices that are frequently employed in FL classes. The following procedures were implemented:

A. Skimming and Scanning

In order to gain a comprehensive understanding of the topic, genre, and writing style of the text, students began by perusing and scanning it. They were instructed to revise their responses to the statements examined in the "anticipation guides" prior to reading, to either affirm or refute them, or determine whether they were missing from the text.

B. Comprehension Activities

Students meticulously scrutinized each word and sentence during the reading process. Comprehension exercises involved making sure they could understand the main topic and details of the text through raising their own questions and responding to them.

C. Critical Reading

When reading is approached through translation, students take on a more active role in the creation of meaning. To interact with the content, they had to demonstrate an inquisitive and analytical perspective, carefully evaluating each part of the text. Hence, they were required to identify the main idea of the text, the problems being discussed, proposed solution, whether the author delivered information or opinion, and any instances of biased language usage.

D. Assigned Arabic Equivalents Activities

Students, in pairs, found Arabic counterparts for key words and phrases emphasized by the teacher. They identified which phrases

required omission, simplification, or rephrasing during translation to guarantee accuracy as well as clarity.

2.2 Translation. Students were introduced to the concept of a "translation unit," which is a logical segment that effectively communicates a complete idea. They learned how to recognize fixed expressions, collocations, and grammatical structures, including noun phrases, verb phrases, and prepositional phrases. In small groups, students practiced segmenting sentences into coherent units, translating them precisely, and then combining them with suitable connecting mechanisms.

2.3 Revision. To facilitate peer evaluation, student groups participated in a three-phase procedure to evaluate draft translations created by other groups. They first performed a comparison examination of the draft and source text to verify that each translation unit correctly reflected the original meaning. They then evaluated the whole translated text, making modifications to improve accuracy, coherence and cohesion, using symbols supplied by the teacher to carry out grammatical modifications. Finally, the students who initially translated the text edited their final versions. Some final outputs were shown in class via PowerPoint to get input from the teacher and classmates.

2.4 Machine Translation. Students were instructed to submit the source text to MT by clicking on the translate option in Microsoft Word after entering the text. Then, they were required to collaborate in groups to edit MT output, and analyze any errors made by the machine and categorize them to grammatical or lexical ones. This facilitated understanding MT constraints.

Back Translation. Students were directed to translate an Arabic translated version of the original text- provided to them by the teacher- back into English.

3- Post-Translation Phase. These tasks ranged from answering questions (orally or in a written manner) on the text to comparing manual translation to MT. It also included fully analyzing the

translation process and conducting comparative analysis between their mother and target languages.

3.1 Comparing Machine Translation to Manual Translation. Students were required to collaborate in groups to compare MT to their own translation. Comparisons were made between the two texts in the following areas:

- Meaning preservation. MT-generated and student-created translations were reviewed by the students to determine whether they effectively represented the message that was meant to be conveyed by the original text.
- Accuracy. Students evaluated the grammatical correctness of each translation.
- Word choices. Students compared the vocabulary and collocations that were used in both translations.
- Fluency and readability. Students evaluated the natural flow of the text in each translation, looking for coherence and cohesion.

3.2 Comparing the Back-Translated Text with Original Text. Both the back translation and original texts were compared to identify areas in which students needed to improve. Then they were nudged to discover the source of the difference by drawing their attention to specific areas including choice of words or phrases, syntactic structures (locating instances of first-language interference and examples where the original text utilized more complex structures compared to their own), coherence, and cultural aspects (alternative ways to express similar ideas, such as through the use of idioms and collocations.

3.3 Comparative Grammar Analysis. The teacher emphasized the structural differences between Arabic and English, stressing the unique linguistic characteristics of each language. For example, Arabic often employs complicated phrase structures and lengthy

pauses, while English typically has a more direct and concise grammar with clear patterns.

3-4 Vocabulary Builder. Students were instructed to find words and expression in Arabic that closely align with words and lexical phrases in English. They were also directed to highlight instances from the texts that demonstrate variations in vocabulary and collocations between the two languages.

3-5 Self –Reflection. Students were encouraged to reflect on their entire translation experience, documenting their discoveries at each stage of the process. These thoughts were a combination of newly acquired knowledge and skills, challenges that had been encountered, and recommendations for future development.

The version of the lessons& worksheets is in (Appendix E).

Statistical Analyses& Results

In this section, results pertinent to the study hypotheses are presented.

Reading Comprehension

Hypothesis One. *There are statistically significant differences between the mean scores of the experimental group on the reading comprehension pre- and post test in favour of the post-test.*

To test this hypothesis, a paired-samples t-test was conducted to compare the overall reading comprehension, literal and inferential comprehension scores of the experimental group before and after the intervention as indicated in table (6).

Table 6

T- Test Results Comparing the Experimental Pretest vs Posttest Mean Scores on the Reading Comprehension Test

Skills	Total score	Exp group pre-test		Exp group post-test		T value	Sig. (2-tailed)	Effect Size
		M	S.D.	M	S.D.			
Overall reading comprehension	**33**	13.2	2.26	26.6.	1.9	25.3	0.001	4.5

Skills	Total score	Exp group pre-test		Exp group post-test		T value	Sig. (2-tailed)	Effect Size
Literal comprehension	**15**	8.4	1.4	13.8	*1.2*	16.3	0.001	2.9
Inferential comprehension	**18**	9.4	2.6	15.2	*1.5*	10.7	0.001	1.93

Table (6) shows that there was a statistically significant difference between experimental group mean score on overall reading comprehension on the pre-test (M = 13.2, SD = 2.26) and post-test (M = 26.6, SD = 1.9), t (31) = 25.3, p < .001, in favor of the posttest, with a very large effect size (d = 4.5). As far as literal comprehension is concerned, results show that there was a statistically significant difference between the mean score of experimental group on the pre-test (M = 8.4, SD = 1.4) and the posttest post-test (M = 13.8, SD = 1.2), in favor of the posttest; t (31) = 16.3, p < .001, with a very large effect size (d = 2.9). Similarly, there was a significant increase in inferential comprehension from pre-test (M = 9.4, SD = 2.6) to post-test (M = 15.2, SD = 1.5), t (31) = 10.7, p < .001, with a large effect size (d = 1.93). These results suggest that the intervention had a substantial positive effect on both literal and inferential reading comprehension skills. So, the first hypothesis was confirmed.

Hypothesis two. *There are statistically significant differences between the mean scores of the experimental group and the control on the reading comprehension post-test in favor of the experimental group.*

To prove this hypothesis, t-tests for independent samples were used to compare the mean scores of the control and experimental groups on the posttest as shown in table (7).

Table 7

T- Test Results Comparing the Control and the Experimental Groups on the Reading Comprehension Post Test

Skills	Total score	Control Group Post test		Experimental Group Post test		T-value	Sig	Effect size
		M	S.D.	M	S.D.			
Overall Reading Comprehension	**33**	18.94	2.3	26.6.	1.9	14.30	0.00	**3.63**
Literal Comprehension	**15**	12.9	*2.4*	13.8	1.2	1.85	0.07	**0.47**
Inferential Comprehension	**18**	11.5	*1.7*	16.2	1.5	9.09	0.000	**2.31**

Table (7) indicates that the comparison of overall reading comprehension between the experimental and control groups reveals a substantial difference in performance following the intervention. The experimental group achieved a mean score of 26.6 (SD = 1.9), whereas the control group scored significantly lower, with a mean of 18.94 (SD = 2.3). This difference was statistically significant, t (60) =14.30, p<.001, with a large effect size (d = 3.63), indicating that the intervention had a noticeable impact on the overall reading comprehension.

Regarding literal and inferential reading comprehension, the mean score for literal comprehension in the experimental group was 13.8 (SD = 1.2), while the control group mean score was 12.9 (SD = 2.4). This difference was not statistically significant, t (60) = 1.85, p > .001. This means that the experimental group's performance did not exceed that of the control group. However, for inferential comprehension, the experimental group achieved a mean score of 16.2 (SD = 1.5) compared to 11.5 (SD = 1.7) for the control group. This difference was also statistically significant in favor of the experimental group, t (60) = 9.09, p < .01, with an even larger effect size (d = 2.31). Thus, the second hypothesis was accepted.

Collocational and Grammatical Competence

Hypothesis Three: *There are statistically significant differences between the mean scores of the experimental group on the collocation pre- and post test in favour of the post-test .*

Hypothesis Five. *There are statistically significant differences between the mean scores of the experimental group on the grammar pre- and post test in favour of the post-test.*

To prove hypotheses 3 and 5, a paired-samples t-test was conducted to compare the experimental group's pre-test and post-test scores in collocational and grammatical competences.

Table 8

T- Test Results Comparing the Pre- and Post-Test for the Experimental Group on the Collocation and Grammar Test

Competence Area	Total score	Experimental group pretest		Experimental group post test		T-value	Sig	Effect Size
		M	S.D.	M	S.D.			
Overall Collocational Competence	**55**	22.23	3.5	49.3	2.2	36.46	0.01	6.55
Lexical Collocation	**35**	17.0	1.8	32.1	2.8	25.26	0.001	4.54
Grammatical Collocation	**20**	14.2	1.5	18.3	2.0	8.46	0.01	1.52
Overall Grammatical Competence	**44**	18.2	3.1	40.3	3.5	26.28	0.008	4.72
Receptive competence	**22**	9.6	2.5	18.4	2.0	15.30	0.00	2.75
Productive competence	**22**	13.6	2.0	17.3	1.5	8.24	0.001	1.48

Table (8) shows that there was a statistically significant difference in students' mean score in overall collocational competence between the pre-test (M = 22.23, SD = 3.5) to post-test (M = 49.3, SD = 2.2), t (31) = 36.46, p < .01, the effect size (d = 6.55). This suggests that the intervention significantly enhanced the students' overall collocational competence. As far as **lexical collocation is** concerned, a statistically significant difference was found between students' mean scores on the pretest (M = 17, SD =

1.8) to post-test (M = 32.1, SD = 2.8), t (31) = 25.26, p<.001. These results indicate that the intervention was effective in enhancing lexical collocation competence. As for **grammatical collocation,** a significant increase was found in grammatical collocation scores from pre-test (M = 14.2, SD = 1.5) to post-test (M = 18.3 SD = 2.0), t (31) = 8.46, p < .01, with a large effect size (d = 1.52). This result suggests improvement in the participants' grammatical collocation competence due to the intervention. Thus, hypothesis three was accepted.

For overall grammatical competence, students showed a significant improvement from the pre-test (M = 18.2, SD = 3.1) to the post-test (M = 40.3, SD = 3.5). The difference between the mean scores of both groups was statistically significant, t (31) = 26.28, p < 0.01, indicating a large effect size (d = 4.72). There was also a noticeable improvement in receptive grammatical competence, as the students' average score on the pretest moved from (M=9.6, SD = 2.5) to (M= 18.4, SD = 2.0) on the posttest. The difference between both groups was statistically significant, t (31) = 15.3, p < .001, with a large effect size (d = 2.75). Similarly, productive grammatical competence improved from the pre-test (M = 13.6, SD = 2.0) to the post-test (M = 17.3, SD = 1.5). The difference was statistically significant, t (31) = 8.24, p <.001, and the effect size was large (d =1.48). Thus, hypothesis five was concerned.

Hypothesis Four. *There are statistically significant differences between the mean scores of the experimental and the control groups on the collocation post test in favour of the experimental group.*

Hypothesis Six. *There are statistically significant differences between the mean scores of the experimental and the control groups on grammar post test in favour of the experimental group*

To compare students' mean scores on the grammar and collocation posttest, an independent t-test was utilized as shown in table (9).

Table 9

T- Test Results Comparing Post Test Results of the Control and the Experimental Group on the Collocation and Grammar Test

Competence Area	Total score	Control post test		Experimental posttest		T-test	P - value	Effect Size
		M	S.D.	M	S.D.			
Overall Collocational Competence	**55**	39.2	1.5	49.3	2.2	21.12	0.001	5.36
Lexical Collocations	**35**	23.0	2.8	32.1	2.8	12.80	0.001	3.25
Grammatical Collocations	**20**	17.25	2.8	18.3	2.0	1.62	0.09	0.43
Overall Grammatical Competence	**44**	28.3	3.1	40.3	3.5	14.29	0.00	3.63
Receptive competence	**22**	14.5	1.5	18.4	2.0	8.69	0.00	2.21
Productive competence	**22**	12.6	3.0	17.3	1.5	7.80	0.00	1.98

Table (9) shows that for overall collocational competence, there was a significant difference between the control group (M = 39.2, SD = 1.5) and the experimental group (M = 49.3, SD = 2.2); t (60) = 21.12; p<.001; in favor of the experimental group; d=5.36. In lexical collocation competence, there was also a significant difference between the control group (M = 23, SD = 2.8) and the experimental group (M = 32.1, SD = 2.8); t (60) = 12.80, p< .001, in favor of the experimental group, d= 3.25, indicating a large effect size favoring the experimental group. For Grammatical collocation competence, there was a slight difference between the control group (M = 17.25, SD = 2.8) and the experimental group (M = 18.3, SD = 2); t (60) =1.62, p> 0.001, which shows that there were no statistically significant differences between the mean scores of both groups.

Overall Grammatical Competence also showed a significant difference, with the experimental group (M = 40.3, SD = 3.5) outperforming the control group (M = 28.3, SD = 3.1); t (60) = 14.29, p < .001, d=−3.63. This suggests a large difference in overall grammatical competence. For Receptive grammatical competence, the experimental group (M = 18.4, SD = 2.0) performed significantly better than the control group (M = 14.5, SD = 1.5); t (60) =8.69, p<.001p, in favor of the posttest, d=2.21. Likewise, as far as productive grammatical competence is concerned, there was a statistically significant difference between the mean score of the control group (M=12.6, SD=3) and the experimental one (M=17.3, SD=1.5), t (60) = 7.80, p<. 001 in favor of the experimental group; d=1.98.

Critical Thinking Disposition

Hypothesis Seven: *There are statistically significant differences between the mean scores of the experimental group on the pre-and post-administration of the critical thinking disposition scale in favor of the post administration.*

To evaluate the performance of the experimental group before and after treatment with respect to critical thinking disposition, a paired samples t-test was conducted as shown in table (10).

Table 10

Paired Samples T-Test Comparing the Pre-and Post-Test Mean Scores for the Experimental Group on the Critical Thinking Disposition Scale

Dimensions	Total score	Experimental group pretest		Experimental group post test		t-test	Sig	Effect size
		M	S.D.	M	S.D.			
Truth-seeking	**15**	6.0	2.2	11.5	2.7	8.2	0.001	2.23
Open-mindedness	**20**	10.37	1.5	14.4	1.2	10.1	0.001	2.9
Analyticity	**15**	9.3	2.1	11.2	0.8	4.1	0.003	1.2
Systematicity	**20**	9.8	1.8	16.2	2.6	8.5	0.000	2.9

Dimensions	Total score	Experimental group pretest		Experimental group post test		t-test	Sig	Effect size
		M	S.D.	M	S.D.			
Self-confidence	**11**	6.8	1.9	7.1	2.06	0.61	0.55	0.15
Inquisitiveness	**25**	10.2	2.8	15.2	1. 4	9.7	0.00	2.3
Cognitive Maturity	15	7.5	1.2	8.9	10.3	1.2	0.22	0.19

Table (10) shows improvement across Critical Thinking Disposition dimensions, indicating the effectiveness of the intervention. Truth-seeking scores increased notably from pre-test (M = 6.0, SD = 2.2) to post-test (M = 11.5, SD = 2.7), with a large effect size (t (31) = 8.2, p < .001, d = 2.23). Similarly, Open-mindedness demonstrated a significant improvement, rising from M = 10.37 (SD = 1.5) to M= 14.4 (SD = 1.2); t (31) = 10.1, p <.001, d = 2.9. Likewise, a statistically significant difference was found between the mean scores of the experimental group on the pre and posttest on the dimension of Analyticity, as students' mean score increased from M = 9.3 (SD = 2.1) to M = 11.2 (SD = 0.8); (t (31) = 4.1, p < .0003, d = 1.2), reflecting a large effect size. In the same way, Systematicity showed substantial progress from M = 9.8 (SD = 1.8) to M = 16.2 (SD = 2.6) (t (31) = 8.5, p < .001, d = 2.9). Also, Inquisitiveness displayed a marked increase, with pre-test scores (M = 10.2, SD = 2.8) significantly improving in the post-test (M = 15.2, SD = 1.4), and a statistically significant difference was noticed between the pretest and posttest, yielding a large effect size (t (31) = 9.7, p < .001, d = 2.3).

However, while the above dimensions showed significant gains, the results for self-confidence and cognitive maturity were somehow different. Specifically, Self-confidence exhibited only a minor increase from M = 6.8 (SD = 1.9) to M = 7.1 (SD = 2.06), which was not statistically significant (t (31) = 0.61, p=0.55, d =

0.15). Similarly, Cognitive maturity did not change much, from M = 7.5 (SD = 1.2) to M = 8.9 (SD = 10.3), with no significant difference observed between mean scores on the pretest and posttest of the critical thinking disposition scale (t (31) = 1.2, p = 0.22, d = 0.19).

Hypothesis 8. *There are statistically significant differences between the mean scores of the experimental and the control groups on the posttest of the critical thinking disposition scale in favor of the experimental group.*

To assess differences in performance between the experimental group and control group on the critical thinking disposition scale following the treatment, an independent samples t-test was conducted. See table (11).

Table 11

Independent T-Test Comparing the Experimental and the Control Groups on the Posttest on Critical Disposition Scale

Dimensions	Total score	Cont. Group		Exp. Group		t-test	Sig	Effect size
		M	S.D.	M	S.D.			
Truth-seeking	**15**	8.0	2.2	11.5	2.7	5.5	0.001	1.42
Open-mindedness	**20**	11.0	3.5	14.4	1.2	5.03	0.001	1.2
Analyticity	**15**	8.5	1.8	11.2	0.8	7.50	0.001	1.9
Systematicity	**20**	12.0	1.8	16.2	2.6	7.3	0.001	1.87
Self-confidence	**11**	6.4	1.3	7.1	2.06	1.57	0.12	0.40
Inquisitiveness	**25**	11.0	2.8	15.2	1.4	7.35	0.001	1.89
Cognitive Maturity	**15**	8.5	1.2	8.9	1.3	0.87	0.39	0.32

Table (11) shows that for the first dimension Truth-seeking, the experimental group (M = 11.5, SD = 2.7) scored significantly higher than the control group (M = 8.0, SD = 2.2), t (60) = 5.5, p = .001, d = 1.42, suggesting a strong effect of the intervention. Similarly, for Open-mindedness, the experimental group (M = 14.4, SD = 1.2) outperformed the control group (M = 11.0, SD = 3.5), t (60) = 5.03, p = .001, d = 1.2, indicating a large effect. A highly

significant difference was also observed in Analyticity, where the experimental group (M = 11.2, SD = 0.8) scored significantly higher than the control group (M = 8.5, SD = 1.8), t (60) = 7.50, p = .001, d = 1.9, reflecting a very strong effect size. Similarly, for Systematicity, the experimental group (M = 16.2, SD = 2.6) demonstrated significantly higher scores than the control group (M = 12.0, SD = 1.8), t (60) = 7.3, p = .001, d = 1.87.

Conversely, Self-confidence did not show a statistically significant difference between the control group (M = 6.4, SD = 1.3) and the experimental group (M = 7.1, SD = 2.06), t (60) = 1.57, p= .12. In contrast, Inquisitiveness demonstrated a significant difference, with the experimental group (M = 15.2, SD = 1.4) outperforming the control group (M = 11.0, SD = 2.8), t (60) = 7.35, p = .001, d = 1.89, signifying a strong effect of the intervention. Lastly, Cognitive Maturity did not show a statistically significant difference between the control group (M = 8.5, SD = 1.2) and experimental (M = 8.9, SD = 1.3) groups, t (60) = 0.87, p = 0.39, d = 0.32, indicating a negligible effect. So, overall, the experimental group outperformed the control group in five of the seven dimensions, with large effect sizes (d > 1.2).

Discussion

The study aimed to assess the effectiveness of data-driven pedagogical translation (DDPT) as a strategy for enhancing specific EFL language skills. It focused on four main domains: reading comprehension, grammatical proficiency, collocational competence, and critical thinking disposition. Basically, the study findings suggest that the proposed strategy helped students overcome a variety of language-related obstacles, thereby enhancing their collocational competence and grammatical accuracy. Results also suggest that students acquired the essential skills required to autonomously resolve a variety of reading comprehension challenges by facilitating their analysis of both explicit and implicit meanings of translated texts. Furthermore, engaging in translation

tasks may have prompted students to scrutinize the text, discuss various linguistic choices, and seek the most appropriate way to express the content, potentially augmenting their analytical and problem-solving skills, which in turn contributed to the observed improvement in their critical thinking disposition.

By and large, the students engaged in a problem -based approach including various activities throughout the intervention, such as comparing human and machine translations, identifying linguistic challenges, assessing possible solutions, back translation, refining the final versions of translated texts and reflecting on the whole translation process. These techniques might have increased their language awareness and facilitated the contextual acquisition of vocabulary and grammar while also improving their reading comprehension skills. This was supported by Kirchhoff (2024), Richieri, & Knight (2024) and Yulianto & Setiawan (2018).

In addition, the study suggests that machine translation (MT) contributed to realizing the study objectives. Generating the final version of the translated text utilizing MT involved an intricate editing process that taught the students to perceive subtle nuances in grammar and vocabulary. This was corroborated by the studies of Garcia and Pena (2011), Lee (2022) and Min (2006). Furthermore, it seems that the use of MT fostered a sense of autonomy among students, as they might have felt more control over their learning (Alharbi, 2023; Zhang & Gao, 2014). It seems that the students made well-informed decisions, likely by drawing on their prior knowledge rather than solely relying on MT. Moreover, they often sought help from their teacher, peers, dictionaries, or other resources when confronted with ambiguity which may have enhanced their comprehension of vocabulary and language structures which is linked to linguistic proficiency (Enkin & Mejias-Bikandi, 2016).

Effect on Reading Comprehension

The findings of this study suggest a possible improvement in reading comprehension among students who received DDPT instruction. Initially, the reading comprehension of students in both

groups was assessed as below average, suggesting a tendency for a superficial understanding of textual content. Subsequent to the intervention, the control group exhibited comparable progress in literal comprehension. However, the experimental group's substantial progress in inferential comprehension implies that translation activities may have facilitated a more profound comprehension and engagement with the reading material. This suggests that breaking down a text at a macro level, followed by a more detailed micro-level analysis during translation, may have helped students focus on key ideas and implicit meanings. As a result, they likely became better at drawing inferences and conclusions that were not directly stated in the text. This conforms to the study of Bhooth, et al. (2014).

Furthermore, it may be claimed that translation has likely motivated students to investigate the viewpoints stated in the text and collaborate to effectively communicate its meaning and intent in their target language. This collaborative approach may have increased student engagement with the reading text, hence improving their ability to make significant conclusions. The juxtaposition of the messages and meanings articulated in their respective translations with those produced by machine translation further substantiated this process. These findings are consistent with the conclusions that Samiei, & Ebadi, (2021) and Boshrabadi (2014) reached. Consequently, taken as a whole, results indicate that pedagogical translation may be beneficial for improving reading comprehension; however, more research is warranted to validate these effects.

Effect on Grammatical and Collocational Competence:

The results indicated that the students demonstrated a significantly high gain in grammatical competence, as they were capable of understanding and using much more complex structures than the ones they used in the pretest. Throughout the translation

process from L2 to L1, students were required to carefully focus on the grammatical structures of both the source and target language which may have enhanced their comprehension of the grammatical similarities and differences between Arabic and increased their awareness of EFL grammatical concepts. Other studies support the findings of the present study, including works by Abdelaal (2020), Arshad et al. (2016), Ghaiyoomian and Zarei (2015), Lee (2022), and Richieri and Knight (2024). From an alternative perspective, the cognitive processes involved in backtranslation (from L1 to L2)—namely analysis, comparison, and sentence reconstruction—might have engaged higher cognitive skills that enhanced the long-term memory of grammatical structures. Backtranslation also facilitated a tailored approach to grammar learning by allowing learners to concentrate on certain grammatical structures that presented difficulties to them (Mohammadi, 2022).

Moreover, it appeared that utilizing MT as part of the learning process enabled EFL students develop more awareness of the gaps in their (FL) interlanguage system or what we call (noticing) (Soleimani, & Heidarikia, 2017). In essence, MT served as a tailored feedback system throughout the revision process. Although it could not provide the most suitable language model, it offered students several choices, encouraging them to reconsider their vocabulary and critically assess their grammatical structures. This contradicts the conventional approach, which often presents students with the rules before allowing them to independently practice grammatical structures.
Students perceived the errors made by MT as intriguing, which enhanced their degree of engagement. This result aligns with the findings of the studies conducted by Ducar and Schocket (2018), Enkin and Mejías-Bikandi (2016), and Jolley and Maimone (2022). Like previous studies (i.e., Raad, 2020; Richieri & Knight, 2024; Wang & Xinli, 2022), students in this study were more receptive to making grammatical changes after comparing their writing with the MT version.

Furthermore, learners were provided with a non-threatening environment to practice language and engage in peer editing of their translations and MT output. This may have alleviated stress by allowing them to make mistakes, recognize their weaknesses, and learn together. The findings of Mohammedain (2021) and Zhang and Gao (2014) also corroborated these results.

Similarly, the results suggest that translation practice enabled learners to improve their proficiency in the lexical aspects of the target language, including collocations. This was achieved by instructing students to meticulously identify and record collocations observed during translation and later use them to form sentences of their own. It is crucial to emphasize that the control group demonstrated substantial improvement in grammatical collocational competence as well. This implies that the pedagogical translation-based strategy did not offer substantial advantages over direct instruction. This can be attributable to the fact that, in contrast to lexical collocations, grammatical collocations that were introduced during the treatment were straightforward to comprehend and necessitated minimal effort from the students to master. However, the progress made by the experimental group in mastering lexical collocations, compared to the control group, suggests that pedagogical translation—reinforced by MT output comparisons—can help students grasp how different lexical phrases and collocations are expressed in English, often in ways that differ significantly from their native language. Additionally, it seems that students gained some awareness of the importance of avoiding literal translation of collocations from their mother language, as it could distort the intended meaning and convey an entirely different message. The study results confirm the findings reached by Boustani (2019), Kirchhoff (2024), Niño (2020) and Richieri, & Knight (2024).

Critical Thinking Disposition:

The results relevant to the fourth objective of the study, which assessed the students' critical thinking disposition, revealed some significant insights. Prior to the intervention, students demonstrated a preference for tasks that were more direct and superficial. On the other hand, after the intervention, it seems that they demonstrated a more positive self-image as critical thinkers. In general, even though DDPT fell short of creating comprehensive development across all dimensions, the study provided some support for the concept that it generally has a favorable influence on the students' critical thinking disposition. This was supported by other studies examining the nature and structure of critical thinking disposition (Facione, 2000; Fountzoulas et al., 2019; Wang & Shen, 2022). Improvements were noticed in the progress students achieved in the dimensions of Truth-seeking, Systematicity, Analyticity, Open-mindedness, and Inquisitiveness. The dimensions of self-confidence in critical thinking, and cognitive maturity, on the other hand, did not exhibit significant signs of improvement.

In particular, DDTP appears to be conducive as far as Truth-seeking is concerned. Throughout the translation process, students were motivated to develop a more profound comprehension of the text's subject matter in order to effectively communicate the original message in a different language. This necessitated a consistent focus on the accuracy and relevance of the information being conveyed. Similarly, the findings suggest that the intervention significantly enhanced Analyticity. This could be ascribed to the fact that students were tasked with assessing several translation options, understanding complex ideas, and analyzing the structures and meanings of both L1 and L2. This rigorous process has likely enhanced their analytical ability tremendously. These findings align with the studies performed by Larenas et al. (2024) and Zin and Wong (2014). The backtranslation process also prompted students to analyze and recognize the nuanced differences between Arabic

and English regarding vocabulary, structures, coherence, and cultural implications.

Moreover, for Open-mindedness, the findings indicate a substantial improvement. In essence, translation is a process that immerses students in a trial-and-error process, during which they evaluate, modify, and compare several translations (Alvarez-Huerta et al., 2022). Furthermore, the range of choices provided by MT might have led students to acquire the notion that language is adaptable and context- dependent. Dealing with MT constraints might have made them more eager to review and change their linguistic presumptions, therefore promoting openness to various alternatives. Furthermore, the translation process seems to have promoted students' engagement with the new material, language structures, and cultural perspectives, so improving their attention and curiosity, which may have motivated them to explore them more deeply. This perspective suggests that active engagement with the translation process may foster and inquisitive mindset or Inquisitiveness (Nguyen, 2024; Wang & Shen, 2022; Zin & Wong, 2014).

Likewise, the findings of the Systematicity dimension reveal that students' inclination to tackle issues and activities in a more organized and logical manner has improved. This could be attributed to the intrinsic structure of the translation process, which requires careful planning, increased attention to details, and methodical organization of concepts. Students had to thoroughly analyze the source material, recognize the relevant grammatical structures in their target language, and ensure that their translations were both precise and coherent. From another perspective, editing MT output necessitated a high degree of precision, as students were expected to rigorously examine the appropriateness of lexical selections and check grammatical accuracy. These results are consistent with findings from other studies on the development of

critical thinking dispositions (e.g., Larenas et al., 2024; Zin and Wong, 2014).

Concerning the sixth dimension- Cognitive maturity- the results indicate little discrepancies in students' performance between the pre-test and post-test.

Similarly, no significant differences were found between the control and experimental groups on the posttest. Cognitive maturity is generally associated with the ability to develop thoughtful judgments guided by mature and well-considered viewpoints. Yet, the little progress in this domain may mainly be ascribed to the short duration of the intervention, which presumably did not provide sufficient time for substantial cognitive development. This shortcoming is particularly apparent considering that the participants in this study were intermediate-level students interacting with very simple texts. Hence, the nature of these limited translation exercises, which mainly emphasize grammatical accuracy, may not have naturally encouraged students to question assumptions or deeply consider alternative viewpoints.

In the same way, the results of Self-confidence in critical thinking dimension suggest a marginal enhancement relative to the control group. A plausible explanation for this limited progress is that students might have perceived translation as a task that often prioritizes accuracy and strict compliance with linguistic regulations, potentially diminishing their opportunities to develop and refine their confidence in critical thinking skills (Álvarez-Huerta et al., 2022). Another possible reason is that students may have relied heavily on MT to address obstacles throughout the treatment, thus diminishing their sense of efficacy and confidence in independently resolving translation difficulties. Furthermore, the little improvement may have been influenced by cultural or educational factors; students are frequently more inclined to seek guidance from their teachers in teacher-centered environments they are used to than to engage in independent problem-solving. Moreover, many students, particularly those with limited technical skills, may have found the use of an MT tool to be burdensome,

compared to teachers' assistance, which could have further impeded their ability to develop self-confidence to think critically.

Conclusion

The study substantiated that DDPT can serve as a valuable tool that enables EFL learners to enhance their comprehension of reading texts and their ability to scrutinize them using logical reasoning. Furthermore, the approach adopted was effective in promoting EFL students' grammatical and collocational competences and in augmenting students' critical thinking disposition. This necessitates reconsidering translation activities in TEFL instruction as a dynamic and stimulating instructional tool designed to complement other EFL instructional methods. The effective implementation of such a framework warrants a transition from the conventional teacher-centered model to a more learner-centered approach.

Furthermore, considering the ongoing development in artificial intelligence technologies, it is imperative for EFL teachers to effectively incorporate advanced technology into their classes. Although previous research has produced varied outcomes, there is a broad consensus about the potential of Machine Translation (MT) as a pedagogical tool for language learning. Recent research has confirmed that MT technology has gained in accuracy (e.g. Enkin & Mejias-Bikandi, 2016; Richieri, & Knight, 2024; Wang, & Xinli, 2022). Therefore, it is essential for teachers to provide students with the requisite abilities to proficiently use these systems in a language acquisition context (Bahri & Mahadi, 2016).

The current research suggests that MT-supported pedagogical translation might have a positive impact on developing EFL students' reading comprehension, collocational and grammatical competences. As far as critical thinking disposition is concerned, the students have shown substantial improvement in their logical reasoning. Nevertheless, specific constraints were

identified in their cognitive maturity and their self-confidence in applying critical thinking skills.

To acknowledge the limitations of the study, it is important to note that the findings cannot be generalized to a large extent because of the small sample size and the fact that the study was conducted just on secondary school students. The engagement of a more diverse set of participants and a wider variety of variables should be the focus of any future research that is conducted in this area. It is important also to conduct further studies that cover a wider range of reading genres, grammatical structures and collocations. Also, a more significant and long-lasting effect can be achieved by extending the period of treatment.

It is recommended that future research adhere to qualitative research procedures to augment the findings of this study, which relied primarily on quantitative methods. Furthermore, future research should examine the potential impact of the proposed data-based pedagogical translation model on other language skills, including speaking and listening. Additionally, it is imperative to conduct research to examine the extent to which the efficacy of incorporating MT into EFL instruction is influenced by the competency level of EFL students.

Moreover, the results of this study have the potential to contribute to a more comprehensive examination of the factors that influence the integration of (MT) into EFL instruction, including the anxiety levels that students may experience during the process. Further research could also examine the extent to which learners' locus of control, self-efficacy, resilience, and need for cognition influence their ability to effectively implement data-based pedagogical translation. Additionally, there should be a greater emphasis on the integration of pedagogical translation into EFL curricula to foster the development of 21st skills, such as cultural awareness, creativity, analytical skills, and critical thinking.

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