Alramadhan, Mohammed H, Ph.D. May 2025 Translation Studies

CORPUS-DRIVEN TRANSLATION PEDAGOGY: AN EMPIRICAL STUDY (202 pp.)

Dissertation Advisor: Brian James Baer

Corpus-based approaches have seen substantial growth across different areas of applied translation studies, with translator pedagogy emerging as a key area of focus. This is evident in the broad range of academic literature, alongside the current ongoing projects, dedicated to this field. While considerable research has already examined the role of different corpus types in translator education, relatively little has been done with parallel corpora to empirically validate the underlying assumptions reviewed in the literature, particularly in terms of English-Arabic translation. This study seeks to bridge this gap by conducting a more systematic and empirical investigation of parallel corpus-based translation teaching (PCBT), taking into account two primary areas of enquiry: 1) if and how the incorporation of parallel corpora has an impact on the quality of student translations, and 2) if and how students find this approach conducive to learning to translate. Student translations and survey responses were analyzed to gain insight into the effectiveness of PCBT.

The findings reveal that PCBT has led to an improvement in translation quality, as seen in its capacity to mitigate error occurrences in student translations. Furthermore, the findings point to the potential of PCBT in fostering more constructive learning through students' engagement in data-driven learning, a process that included observation, negotiation, evaluation, and critical thinking. Finally, the responses from the survey demonstrate that the students exhibited positive

attitudes toward PCBT, recognizing its impact not only in terms of improving their translation accuracy and quality but also in terms of reinforcing positive attitudes toward translation.

Keywords: translation, corpus linguistics, translator education, parallel corpora, translation quality

Corpus-driven Translation Pedagogy: An Empirical Study

A dissertation submitted

to Kent State University in partial fulfillment of

of the requirements for the

degree of Doctor of Philosophy

by

Mohammed H. Alramadhan

May 2025

Dissertation written by

Mohammed H. Alramadhan

B.A., King Faisal University, 2010

M.A., King Faisal University, 2015

M.A., Kent State University, 2019

Ph.D., Kent State University, 2025

Approved by

Brian James Baer , Chair, Doctoral Dissertation Committee

Richard Kelly Washbourne , Members, Doctoral Dissertation Committee

Ryan T. Miller

Bridget K. Mulvey

Ryan R. Hediger , Graduate Faculty Representative

Accepted by

Patrick Gallagher , Chair, Department of Modern and Classical Language Studies

Mandy Munro-Stasiuk , Dean, College of Arts and Sciences

CONTENTS

LIST OF FIGURES

LIST OF TABLES

PREFACE

As I am writing the final thoughts in my dissertation, it occurred to me to add this section to wrap up my conclusion and dissertation. Many reasons pushed me to include this note in the dissertation, hoping that such a reflection impacts my readers in some way or another. However, I will limit my discussion to the very reasons that influenced me the most. First, my research was a long voyage of discovery, and along its path, I stumbled at many challenges that could have stopped me from continuing my academic pursuit on many occasions. I am a father of three wonderful girls, two of whom are in school. To balance the enormous needs of childcare and the demands of PhD research required a Herculean will, so to speak. It was challenging to find time to help them with their schoolwork, attend their regular school events, be constantly present at home when they came from school, and take them out on weekends to be part of their tiny, joyful world. It was, indeed, an overwhelming task, especially when I had to grapple among meeting deadlines, reading piles of research sitting on my desk, and jotting down some thoughts on paper for the project. It is truly *the* continuous running between parenthood and research that taught me how to become resilient against the tremendous odds I faced.

The voyage was also challenging as I had to go through endless bureaucratic barriers inherent in the research context itself. Institutional obligations added layers of difficulties, especially when I knew for a fact that I had a limited timeframe to finish my experiment, and any delay in running meant failure to have it finished during a summer semester, which, in turn, meant I had to wait for another year. Obtaining a series of approvals, finalizing documents to run an experiment, and getting administrative paperwork signed was very slow and added a psychological burden on top of my head, testing my patience and strength on many occasions.

Such difficulties were coupled with the agony of finding new emerging research publications with a similar idea to my own, only a few months before completing my dissertation. It is not that I am against it—not at all! It is just the fact that the idea, which I deemed unique to my own research, is no longer mine and attributed to my work. Though I felt bombarded with guilt and anxiety regarding the originality of my endeavor, I pushed myself to continue working on my dissertation, reminding myself that ideas are to be shared, not owned, and that ideas can converge, but it is our methodology and the research context that are likely to draw our own research identity, making it distinct from other works, despite the overlap.

To sum up, I'm sharing these thoughts not as a catharsis but as a testament to shed some light on the intrinsic challenges of doing research. It is a voyage that is fraught with absolute difficulties, but with it we also grow both intellectually and psychologically. Such a voyage can be engulfed by losses but also by gains, and by moments of doubts but also by undeniable certainties. We make mistakes and we often stumble, but we eventually rise, flourish and glow. I want to end with a poem by David V. Bush (1921: 91) that has always inspired me, and which I always repeat in times of difficulty. It is entitled *Try Again*.

When you've tried and failed and lost,
Try again!
When astray your plans are tossed,
Try again!
Other days are just ahead;
Other men have fought and bled;
Others oft have tried and said,
Try, try again!

When life seems an empty state,
Try again!
When you pause and question fate.
Try again!
Other men have heaved a sigh;
Other men have longed to die;
Others, too, have paused to try-
Try, try again!

When you've cast your die and failed,
Try again!
When your star has waned and paled,
Try again!
Other men have lost their way;
Others stuck and won the day;
Others now in wisdom say,
Try, try again!

When the world's been cold and rough,
Try again!
When you meet each harsh rebuff,
Try again!
When misfortune's flailed you blue;
Circumstances dogged you, too,
Then there's one way left to you-
Try, try again!

ACKNOWLEDGMENTS

This dissertation stands not only as a fulfillment of an academic dream since my B.A. but also as a testament of a personal determination to go beyond the ordinary, willingness to accept challenges, and aspiration to learn. The journey to this moment has not been a bed of roses, but a path full of hurdles and triumphs, each of which represented a valuable lesson to take for the rest of my life. This endeavor has taken many years of my life but has given me very much in return. During this journey, I received unwavering support from many people whom I would like to acknowledge.

First, I would like to express my deepest appreciation to my advisor, Dr. Brian James Baer, for his dedication to working with me on every step of this dissertation. His commitment, support, and guidance not only shaped my work but also constituted a source of inspiration to learn from. I would also like to extend my thanks to the committee members, Dr. Kelly Washbourne, Dr. Ryan Miller, Dr. Bridget Mulvey, and Ryan Hediger for their thorough feedback and for their thought-provoking comments. Their input was instrumental to the quality of my work.

I also owe a great debt of gratitude to my wife, Ramlah, who believed in me and who endured my long absence, both physically and mentally, during my journey. She was indeed the silent force behind my success. I am also indented to my beautiful children, Fatimah, Layan, and Jasmine, for their endless support, patience, and compassion during the course of my PhD life. They were the light in my darkness and the strength in my weakness.

I am also deeply grateful for my parents and siblings. Despite being thousands of miles away from me, they never left me alone. They were present, both mentally and emotionally, in every moment of my journey. Their continuous love, support, and encouragement was a pillar to

lean on. I am indebted to my doctoral fellows at Kent State University, with whom I exchanged knowledge, laughter, and concerns.

I am also grateful for King Faisal University for giving me this opportunity to pursue my doctoral degree at Kent State University. My sincere thanks also go to the participants who agreed to take part in my study. Their consent to take part was at the heart of this study. Last but not least, I extend my thanks to my friends who supported and encouraged me during this whole journey.

Mohammed H. Alramadhan
Kent, Ohio
February 7, 2025

CHAPTER 1: INTRODUCTION

In her chapter, *Technology and Translator Training*, Kenny (2020) underlines that technology is "a vital ingredient" required for success in translator education. She then goes further, arguing that "an understanding of contemporary translation is almost impossible without such [technological] knowledge" (p. 498). One can trace in the literature of translation studies this growing emphasis on incorporating translation technology into translator education. Several researchers (Frérot, 2016; Rico, 2017; O'Brien & Vázquez, 2020) have addressed the role of, and the need for, technology as an indispensable requirement in translation pedagogy. As Pym (2001) argues, "technological changes (…) have radically changed the labour market (…) mean[ing] that traditional teaching practices are no longer adequate" (p. 7). In fact, technology is now regarded as a competence in and of itself, designated as instrumental competence (PACTE, 2003, 2011; Kelly, 2005; Göpferich, 2009; Hurtado Albir, 2017).

Numerous studies have examined the integration of various translation technology tools in teaching translation, including computer-assisted translation (CAT) tools (Rodríguez-Castro, 2018), machine translation (MT) systems (Moorkens, 2018), translation memory (MT) systems (Killman, 2018), bilingual concordances (Bowker & Barlow, 2008), and, most recently, the artificial intelligence (AI) systems (Abu-Rayyash, 2023; Tekwa, 2024). Such tools have been found to have almost limitless capacity to systemize and streamline the process of translation and enhance translation quality and productivity at all levels. Yamada (2020), for instance, argues that translation technologies are so powerful that they diminish the gap in translation performance between translating into one's first language (L1) and second language (L2).

Furthermore, in harmony with the pursuit of integrating translation technology into translator education, there has been a parallel interest in moving away from teacher-centered teaching paradigms to more learner-centered translation pedagogy. Learner-centered pedagogy has gained popularity globally in twenty-first century education for its capacity to enhance creative and critical thinking, learner autonomy, and lifelong learning (Hoidn & Reusser, 2021; Schell, 2012). In this educational paradigm, students are encouraged to become more responsible for constructing their own learning by actively participating in the teaching-learning process and taking on more dynamic roles in negotiation, inquiry, and evaluation, among other tasks, while teachers' involvement is limited to facilitation and guidance, as well as task design.

Student-centeredness in translation pedagogy can be achieved in multiple ways, through task-based instruction (Koby & Baer, 2003), experiential learning (Kiraly & Massey, 2019), and social constructivism (Kiraly, 2014), among others. Researchers have illustrated how each of these teaching/learning models can be used in practice to teach translation, giving examples of the classroom setting, mode of delivery, as well as the possible tasks to be used to streamline the learning process and maximize the opportunities for student involvement in learning.

In this study, however, I argue that the shift to more learner-oriented translation pedagogy can be looked at not only in terms of the teaching methodologies but also in terms of the technological tools used in translator education. CAT tool systems have received the lion's share of attention in the discussion of instrumental competence; yet technological advances have made it possible to incorporate a wider variety of technological tools and systems into translator education, such as corpus tools, which is the focus of this study. Thanks to the advancement of technology, texts are now easily digitized, facilitating not only the use of corpora but also their creation. What used to seem almost impossible, such as searching for a particular word(s) in a

body of a million, and now a billion words of text, is now feasible with the click of a mouse. Such technological developments have allowed translation researchers and educators alike to utilize corpora as a valuable resource for both researching and teaching translation.

Taking into consideration the emphasis in the literature on both translation technology and student-centered pedagogy, I, therefore, see electronic corpora as a potential avenue for facilitating the effective integration of translation technology into translator education and, at the same time, empowering the adoption of learner-centeredness. In this vein, Laviosa and Falco (2023) maintain that the incorporation of electronic corpora in translator education is looked at as a pedagogical endeavor that seeks to foster a "socio-constructive" learning context (p. 11). They argue that this approach encourages learners to think, argue, and raise questions about the examples they find, consequently moving them toward a more active, expressive, and dynamic approach to learning.

Research into the use of corpora in translation education has been growing exponentially since Baker's (1995) call for a corpus-based approach to studying translation. She argued that the use of a corpus-driven methodology can support the descriptive study of translations, now freed from the traditional prescriptivism of individual expert accounts. A corpus-based approach allows for a far more objective outlook and helps scholars "[go] some way towards fulfilling the growing need for a rigorous descriptive methodology" that documents natural language as it occurs through translation (p. 244).

This new research paradigm, which has developed into a fully-fledged field of its own known as Corpus-Based Translation Studies (CBTS), has informed and diversified research in translation from the 1990s onwards. Several areas of inquiry now rely on corpus-based approaches to test theoretical assumptions by investigating large repositories of authentic data.

Translator education and training is an area that lies at this juncture, where concerns are prompted by the desire to improve student translation quality, and to better understand student translation behavior, assessment and evaluation.

1.1. Definition of Key Terms

Before delving into a detailed discussion of the topic, it is essential to operationalize some key terminology and put it into context as many of these terms will be referenced in the next sections as well as the rest of the dissertation. First of all, as this study deals with language and translation, it is imperative to define two key terms here: **source** and **target** languages. Among the basic definitions I cite here are the one used by Hatim and Munday (2004). A *source* language corresponds to "the language the text was originally written in," and a *target* language refers to "the language of the translation" (p. viii).

The notion of a **corpus** is essential and constitutes the core of this study. It is discussed in greater length in Section 2.1. Yet, it suffices to note here that a corpus refers to "a collection of texts held in machine-readable form and capable of being analyzed automatically or semi-automatically in a variety of ways" (Baker, 1995, p. 225). The defining elements, besides others discussed further in Section 2.2 make a corpus distinctive from any collection of writings. A corpus can include texts of various types and genres, from different domains and on different topics and themes.

Another important term to explicate is **parallel corpora.** This corpus type (see Section 2.4. for more on corpus types) refers to a collection of texts in an electronic format, written in a source language alongside their translations in a target language, usually aligned together at the sentence or paragraph level (Zanettin, 2014). In the present empirical study, such a corpus was incorporated in the context of **translator education**. Translator education, often contrasted to

translator training, is related to a long-term course of study in which emphasis is placed on "learning to learn and transversal skills" (Washbourne, 2019, p. 597) and on competences beyond linguistic competence, which receives the most attention in translator training programs for vocational objectives (Pym, 2012). Based on this corpus type, I propose a **parallel corpus-based teaching (PCBT)** approach, which, as its name suggests, embraces the use of parallel corpora as a main resource in teaching translation.

Furthermore, since this study is dealing with translator education, it is essential to highlight the differences between two teaching paradigms, one based on the teacher and the other on the student. In **teacher-centered pedagogy**, teachers assume the role of transmitters of knowledge, while students remain passive recipients of knowledge. This pedagogical model has been criticized in the field of translator education as "inauthentic, inactive and disempowering" (Kiraly, 2000, p. 52). In contrast, **learner-centered pedagogy** places students at the forefront of education, offering a learning environment in which students become active contributors to and builders of knowledge and in this way achieve deeper learning and processing (Hoidn and Klemenčič, 2021).

Last but not least, as the use of parallel corpora as a translation aid requires some training, I categorize it among **computer-assisted translation (CAT) tools**, which refer to software applications used to assist human translation and are distinguished from machine translation (MT) tools (Bowker & Fisher, 2010).

1.2. Statement of the Problem

Different corpus types, such as monolingual corpora (Bowker, 1998, 2000; Stewart, 2000; Ramos & Moreno, 2016; Alshubaily & BinSultan, 2023), comparable corpora (Zanettin, 2000; Pearson, 1996; Zanettin, 1998; Laursen & Pellón, 2014), ad-hoc corpora (Bertaccini &

Aston, 2001; Varantola, 2003; Krüger, 2012), and learner corpora (Bowker & Bennison, 2002; Olohan, 2004; Granger & Lefer, 2020; Obrusnik, 2023), have made major contributions to the field of CBTS and translation pedagogy. They have been widely used for a variety of theoretical and empirical ends. However, the use of corpora as a pedagogical tool has been less empirically researched, and "more empirical research is still needed in order to assess the benefits of corpus-informed translation for language as well as translation learning" (Laviosa and Falco, 2023, p. 28). This lack is particularly evident with respect to parallel corpora, which have been less empirically researched than other forms of corpora (Hu, 2016; Liu, 2020; Liu et al., 2023).

The current literature on parallel corpora has discussed their role in translator education mostly on theoretical and methodological grounds, based either on scholarly intuitions or on made-up examples, with only a handful of empirical studies investigating their role in translation pedagogy (Liu, 2020). This is due perhaps to the lack of parallel corpora in many language pairs since their creation and alignment typically require a tedious and lengthy process (Bowker, 1998). Liu et al. (2023) address this matter in particular, arguing that

> scholars emphasise the particular usefulness of parallel corpora in specialised translation, allowing translators to search for equivalent technical terms, unmarked sentence structures, and stylistic conventions (…). Nevertheless, parallel corpora are comparatively less utilised in corpus-assisted translation teaching compared to monolingual and comparable corpora, partly due to the challenges involved in collecting high-quality parallel texts (p. 137).

This scarcity is especially evident in Arabic-English translation. Studies that have been conducted involve various language pairs, such as English-Chinese (Liu, 2020), Italian-English (Zanettin, 2001; Stewart, 2018), Spanish-English (Pearson, 2003; Gallego-Hernández, 2015),

and French-English, (Bowker, 2001; Frérot, 2013). To the best of my knowledge, however, there are no empirical studies involving the Arabic-English language pair, with the exception of Alhassan et al. (2021).

While Alhassan et al.'s study is an ambitious attempt to explore the usability of parallel corpora in translator education for Arabic-English translation, there are some issues that are worthy of mention. First, the researchers compiled a few Arabic texts, which they then translated into English to create an ad hoc Arabic-English parallel corpus. The decision to self-translate the texts puts authenticity and objectivity in jeopardy since students could explore only a limited sample of texts translated by the teachers, who mention their long-term teaching experience but not any professional translation expertise. Second, giving students a corpus of texts translated by the researchers themselves supports a more teacher-centered paradigm, in which teachers are the all-knowing figures who provide the master translation to be followed. Third, although the exact corpus size was not specified, I assume it was very limited, given that the researchers had to translate all the texts. As a consequence, the corpus may not represent a wide variety of text types, raising doubts as to the sample representation, which is a defining feature of a valid corpus (Sinclair, 2001, 2005; McEnery & Xiao, 2007). Lastly, the corpus was provided in a paper-based format, which, in my opinion, creates a paradox as one of the basic incentives for incorporating corpora is that they are machine-readable (Baker, 1995; McEnery & Wilson, 2001; Brezina, 2018). Opting for a paper-based corpus both contradicts professional industry practice and denies learners an authentic learning experience.

The second issue I will address in this study pertains to the current state of translator education at most Saudi universities, which is generally characterized by a teacher-centered approach that relies on what González-Davies (2004) refers to as a "read-and-translate"

approach. In such an approach the teacher assumes the role of an all-knowing figure and, in Kiraly's (1995) words, "the guardian of […] the correct translation" (p. 99), with very minimal student-teacher interaction. This is documented in Almugharbil's (2021) recent survey, showing that traditional translation teaching is still the norm at multiple universities in Saudi Arabia, characterized mostly by the antiquated grammar-translation method (p. 386). The teacher-centeredness in Saudi translation programs has been supported by various studies addressing the issues from different standpoints, such as translation assessment and feedback (Alfayyadh, 2016; Al-Ahdal et al., 2017; Almohaimeed, 2021), translation program outcomes (Altuhaini, 2015), and curriculum development and design (Almugharbil, 2021). In the context of these studies, two themes emerge as common characteristics of traditional teaching: a) the use of dictionaries, and b) the lack of translation technology.

In a recent study, Altuwairesh (2021), for example, maintains that despite students' awareness of the importance of translation technology and translation tools, reliance on dictionaries as the only tool to assist with translation is a common practice in translation classes at multiple Saudi universities. She finds that around 80% of the surveyed students had no access to translation tools other than dictionaries. Al-jarf (2017) finds that, despite the rapid development of translation technologies, translation students were still confined to a traditional teaching setting, in which they were required to use dictionaries only (p. 3). The over-reliance on traditional tools can perhaps be attributed to the "belief (…) that students should gain skills in the fundamental human process of translation before becoming reliant on tools" (O'Brien & Vázquez, 2020, p. 272).

In any case, as far as translation technology is concerned, teaching translation in many Saudi university translation programs does not involve the integration of leading-edge translation

technologies. Altuhaini (2015), for example, surveyed translation programs and market demand in Saudi Arabia. The results show that translation technology was absent from most translation programs, creating a significant gap between the needs of the Saudi translation industry, which is driven by translation technology, and the outcomes of translation education programs. Now, some six years after Altuhaini's (2015) study, the same issue persists, as evident in Almugharbil (2021), the most recent study of this problem. After examining several Saudi translation programs, Almugharbil finds that translation technologies "comprise an area where alignment with contemporary working practices in the translation industry is severely lacking" (p. 408). The reasons, one might assume, are related to: a) the high cost of translation technology tools, which require annual subscriptions for all lab computers; and b) the need to train translation instructors on such tools, which poses a special challenge as many translation courses at Saudi universities are taught by instructors whose educational backgrounds are in languages and literatures and are, therefore, unfamiliar with these tools, as reported by Al Anazi (2016) and Almugharbil (2021).

The problem with traditional, technology-free, teacher-centered pedagogy is that 1) it neither prepares students for the professional reality of translation as it lacks authentic learning experiences which, according to Kiraly (2012), are "the key activity in the educational process, with the students' main focus being on tackling, experiencing and learning about the translator's profession through the real work at hand in the classroom" (p. 84), nor does it impart the necessary instrumental skills and knowledge required to be successful in their potential profession; and 2) it focuses only on the linguistic surface of a text and neglects "the extralinguistic qualities that are increasingly prized within the contemporary language industry,

such as flexibility, creativity, resourcefulness, professionalism, and the ability to work in teams" (Koby & Baer, 2003, p. 211).

1.3. Research Questions

In light of the above issues, this study aims to empirically investigate the use of a parallel corpus-based approach in translator education with the goals of: 1) contributing to the limited body of empirical research on the use of parallel corpora for pedagogical purposes in general and in Arabic-English translation in particular; and 2) promoting more learner-centered instruction into translation classes in translation programs in Saudi Arabia. In doing so, I am particularly interested in testing whether the use of parallel corpus-based teaching (PCBT) has an impact, if any, on student translation output. This will be investigated in terms of both the number and type of errors in student translations done with the aid of parallel corpora when compared with those made by students who complete the assignments with the assistance of dictionaries alone. To that end, this study will address the following two research questions:

Research question I:

Does the use of PCBT affect the number of errors in student translations?

Research question II:

Does the use of PCBT affect the type of errors in student translations?

1.4. Organization of the Dissertation

This dissertation is organized into five chapters. The current chapter offers an introduction to the topic of the study, highlighting the research problems that motivated the study. The second chapter introduces a detailed literature review of corpora in translation, chronicling their development in linguistics and later adoption in the field of translation studies. The third chapter presents the methodology used to carry out this empirical study, outlining the

experimental design, the tools, and the participants, followed by a discussion of some ethical considerations that were taken into account when conducting the study. The fourth chapter offers a detailed quantitative analysis of the results. Chapter five presents a discussion of these results. The final chapter ends with a summary of the overall study, followed by both a discussion of the limitations I encountered during the course of the study and a proposal for future research.

CHAPTER 2: LITERATURE REVIEW

This chapter introduces the relevant literature on corpus-related translation education. It begins with a historical description of corpora, then traces the development of large-scale corpora with the advent of technology. This is followed by a discussion of how corpora were adopted and applied in the discipline of translation studies. Then, the chapter explores how corpus-related approaches were integrated in translation pedagogy, highlighting various research studies that utilized different corpus types for teaching and training purposes. The chapter ends with a focus on the potential gap that this study attempts to fill, with a particular emphasis on the context of translation pedagogy in Saudi Arabia.

2.1. Corpus: A Historical Glance

The idea of a linguistic corpus, as we know it today, existed earlier than its recognized emergence as a field of linguistics in the 1980s. Corpus studies date back to the 13th century, when different scholars in biblical and literary studies began compiling corpora for various purposes (O'Keeffe & McCarthy, 2022). In biblical studies, the idea of building a corpus emerged out of a need to "specify for other biblical scholars, in alphabetical arrangement, the words contained in the Bible" (p. 3) and "to show that the various parts of the Bible were factually consistent with each other" (Kennedy, 2014, p. 13). Corpora have also been the center of attention for scholars in literary studies. Several scholars in the 18th century saw the need for building corpora of literary works to examine norms related to spelling, grammar, and stylistics. Other scholars built corpora of Shakespeare's works, producing concordances of Shakespeare's lexicography (Karpova, 1992).

Corpora were also used by linguists before the 1980s. As O'Keeffe and McCarthy (2022) point out, interest in corpus projects was evident already in the 17th century. For example, Samuel Johnson was among the first lexicographers to build a corpus. This involved recording on slips of paper authentic sentences from the works of different authors and poets to illustrate word meanings and usage. Similar corpus-based endeavors can also be traced to the 1880s, when the remarkable efforts of James Murray and others resulted in the first volume of the *Oxford English Dictionary* (OED), which included more than three million slips of paper documenting the meanings of words with authentic examples from literary sources (O'Keeffe & McCarthy, 2022). The final volume of this corpus-based dictionary appeared in 1928, representing 71 years of laborious compilation. The OED is today considered "one of the greatest pieces of linguistic scholarship in English or any language, and it was done without the contribution of speed, accuracy and exhaustiveness which the computer can bring to the task" (Kennedy, 2014, p. 15).

With the advent of computers, however, the task of building corpora for linguistic scholarship has become much easier and far less daunting. Linguists became increasingly intrigued by the possibilities of corpora, despite the criticism they received from renowned linguists such as Chomsky (for more on this debate, see McEnery & Wilson, 2001); yet the wave of criticism did not halt scholars from exploring the potential of corpora for their research endeavors, and they continued to undertake new corpus-based projects. It was not until late in the 1980s that the marriage between corpus and linguistics produced what we know today as *corpus linguistics* (McEnery & Hardie, 2012). As the field began to take shape in the 1980s, the notion of a linguistic corpus was reconceptualized from being simply any collection or *body* of texts, which the Latin meaning denotes.

Francis (1982) is among the first to define a linguistic corpus as "a collection of texts assumed to be representative of a given language, dialect, or other subset of a language, to be used for linguistic analysis" (p. 7). Three significant observations can be made in regard to Francis's definition. First, representation is highlighted as an important and necessary value in the creation of any corpus. In other words, the sampled texts in any corpus must be exhaustive and representative of the language in order to yield valid and reliable results when queried, and that, in turn, hints at the second observation, which is diversity. This is to say that representation is equated with the inclusion of various text types and genres, so that a corpus might reflect the complexity and nuances of language. The latter characteristics accounts for Kučera and Francis's earlier efforts to include 15 different genres in their well-known the *Brown* corpus, which was developed during the 1960s at Brown University. Third, Francis attempts to draw a distinction between a linguistic corpus and any compilation of texts. According to Francis, a linguistic corpus includes texts that are solely subjected to linguistic research "since there can be large collections [of texts] whose purpose is other than linguistic" (Francis, 1992, p. 17), such as anthologies used by literary scholars.

Another scholar worth mentioning is Sinclair (1991), who describes corpus as "a collection of naturally occurring language text, chosen to characterize a state or variety of a language," which "typically contains many millions of words" (p. 171). In his book *Corpus, Concordance and Collocation,* Sinclair draws a distinction between two different types of corpora, namely, sample and monitor corpora. The former represents a finite set of texts containing limited text genres; rather small in size, it is regarded as a mere collection of texts that does not help in representing the "state of the language" (p. 24). The latter type, on the other hand, is infinite, and is regularly updated through the addition of texts. This corpus type is

greater in size and includes machine-readable sets of texts that make linguistic research more practical and yield more accurate results. Sinclair advocates for this type of corpora, asserting that linguists need corpora of this massive size as they allow "new kinds of access to the patterns of the language which bombard readers every day, but which, because of the circumstances of language use, are inaccessible to direct observation" (p. 26).

In the same vein, Engwall (1992) offers a definition of a linguistic corpus as a "set of texts in machine-readable form established for general or specific purposes by previously defined criteria" (p. 167). Engwall delineates several features distinguishing linguistic corpora from any other set of collected texts, she refers to with the terms *text banks* or *text archives*. These criteria include the category of text (written or spoken), text genres, time, period, and sampling (representativeness). She goes on to argue that it is the methodology of compiling the texts that determines whether we refer to our collection of texts as a corpus or a text bank.

McEnery and Wilson (1996, 2001) clarify that the concept of corpus has developed in modern linguistics and acquired greater specificity. They define a corpus as "a finite-sized body of machine-readable text, sampled in order to be maximally representative of the language variety under consideration" (p. 23). They outline several parameters that are essential in determining what constitutes a linguistic corpus from any random collection of texts, namely, 1) the representativeness of the corpus; 2) its size; 3) its form; and 4) its standard reference. These parameters are what distinguish a corpus from a text archive (i.e., a huge collection of texts), which typically does not require planned and systematic compilation (Kennedy, 2014).

More recently, definitions of corpora have included other forms of written texts, such as texts primarily composed of transcribed language. This is clear in Brezina's (2018) definition of a corpus as "a collection of texts (or transcripts of speech) that can be analyzed using a computer,

[which] can be either general, reflecting the language as such, or specific, focusing on a particular genre, author, or area of language" (p. 15). Similar to this definition is that of Barth and Schnell (2021), who describe a corpus as "a collection of texts that serves as the empirical basis for the study of natural languages" (p. 7). They treat texts in a corpus as any form of authentic recorded language, written or oral, transcribed so as to be machine-readable. These transcribed texts in the above definitions can, in fact, be associated with another corpus type now known as *spoken corpora*, which can serve various linguistic purposes, such as studying the grammar of a spoken language, dialects, and conversation analysis (Gut, 2020).

From the above corpus definitions, one can discern a constellation of elements that appear across these definitions. These common elements include the following:

1. A linguistic corpus contains a large, organized collection of texts, meaning that the process of text compilation is not done randomly, but is systematic, structured, and planned according to pre-determined criteria;
2. A linguistic corpus is typically digitized and machine-readable, indicating that the texts in a corpus are collected and maintained digitally and are no longer offered as printed texts;
3. A linguistic corpus is used for linguistic research, which differentiates it from other corpus types that can be used for purposes other than the study of language, such as anthologies used for literary purposes or text archives;
4. Lastly, a linguistic corpus is representative, indicating that a corpus must reflect the diversity of a given genre, language variety, or register.

2.2. Corpus Linguistics in Translation Studies

Corpus linguistics has expanded since the 1980s, particularly after Sinclair's first corpus-based dictionary was created. The field progressed through several stages thanks to the

proliferation of corpus technology (for more on these stages, see McEnery & Hardie, 2012). Since then, the field "has become mainstream as a methodology, if not a theoretical approach, in the academic study of language," especially with the capacity of compiling hundreds of millions of words in many languages (Zanettin, 2014, p. 7). This methodology[1] has been applied in other disciplines that also focus on language, including language education (Jablonkai & Csomay, 2022), discourse analysis (Flowerdew, 2013), contrastive studies (Mikhailov & Cooper, 2016), ideological studies (Fuster-Márquez et al., 2021), and literature (Hoover et al., 2014).

Researchers in translation studies have also made use of corpus linguistics approaches, particularly after the so-called empirical turn in the discipline, when scholars began to steer away from intuition-based hypothesizing in favor of more objective, data-based studies. Bernardini and Castagnoli (2008) argue that "translation is in many senses an ideal field for corpus applications" (p. 39). The early use of corpora in translation took place in the 1990s under the influence of corpus linguistics. Baker (1993) was among the first to introduce a corpus-based approach to the study of translation. She contends that translation is a phenomenon that cannot go unnoticed by corpus studies, given the large volume of translated materials available. She argues that such a volume of translated texts, together with access to corpus linguistics as a methodology, can uncover much about the nature of translating and translation, marking a turning point in the history of translation studies. As Baker contends:

> access to large corpora of both original and translated texts, and the development of specific methods and tools for interrogating such corpora (…) provide theorists of

[1]This point raises a controversy among theorists about whether to regard corpus linguistics as a methodology. Some linguists (see Tognini-Bonelli, 2001; Teubert, 2005; Williams, 2007) argue against this perception and extend corpus linguistics well beyond its methodological function in the sense that it has developed into a separate field of study. Others, however, claim that the theoretical status corpus linguistics enjoys does not entail disciplinarity. They would rather look at it as a methodology (see McEnery & Wilson, 1996; Meyer, 2002; Olohan, 2004).

translation with a unique opportunity to observe the object of their study and to explore what it is that makes it different from other objects of study (p. 235).

Since then, many scholars have incorporated corpora as the main research tool to investigate various aspects of translation and, more recently, interpreting. Laviosa (2004) contends that such a surge in the number of corpus-based translation research was already apparent by the late 1990s—a surge that she termed the *corpus turn* in translation studies. This growth was synchronous with the growth of research in corpus linguistics, notably resulting from the increasing size of multiple corpora such as the British National Corpus (BNC), the Corpus of Contemporary American English (COCA), and Cambridge Language Survey, among many others. Laviosa highlights that this "partnership" between corpus linguistics and translation resulted in the emergence of the field corpus-based translation studies (CBTS), which has opened the door for empirical approaches to the study of translation, arguing that this discipline offers a far more objective understanding of the nature of translated and non-translated language and enables scholars to discern linguistic peculiarities that are governed by socio-cultural factors based on tangible data. She further asserts that corpus-based approaches encourage scholars to explore both theoretical and practical research paradigms, investigating a broad array of topics, such as ideology, norms, and universals, as well as addressing more practical topics, including translation quality, assessment, translation process, and translation education. The latter is of particular interest for the current study.

During the evolution of this partnership, several attempts were made by translation scholars to propose different corpus types. Without losing sight of the importance of all these contributions, it is worth noting that there is an apparent lack of consensus on terminology among translation scholars and researchers. This confusion can be seen in the different

designations suggested for the same corpus concept. For instance, a collection of texts translated by students is referred to by many scholars as learner translation corpora (Granger, 1993, 2003; Olohan, 2004; Granger & Lefer, 2020). Others, such as Bowker and Bennison (2003), refer to this corpus type as the *Archive of Student Translations* (AST). Similarly, a collection of texts comprising source texts and their translations is referred to as a *translation corpus* by researchers like Granger (1996) and Aijmer and Altenberg (1996), while the same concept is identified as a *parallel corpus* by most researchers, including Baker (1993) and McEnery and Wilson (1996).

According to McEnery and Xiao (2007), the disagreement on terminology is related to the absence of a clear operationalization of corpus collection criteria. They argue that corpus-type designation is not random and is linked to the text collection criteria set forth by the researchers. To decide whether a corpus is monolingual, parallel, or multilingual, for instance, we need to begin by asking the following questions: How many languages are involved in the collection? How are we going to align the texts? What directionality are we considering? As McEnery and Xiao (2007) explain:

> [w]hen we define different types of corpora, we can use different criteria, for example, the number of languages involved, and the content or the form of the corpus. But when a criterion is decided upon, the same criterion must be used consistently. For example, we can say a corpus is monolingual, bilingual or multilingual if we take the number of languages involved as the criterion for definition. We can also say a corpus is a translation (L2) or a non-translation (L1) corpus if the criterion of corpus content is used. But if we choose to define corpus types by the criterion of corpus form, we must do so consistently (p. 19).

Baker (1995) defines three types of corpora that could be used for translation research and education: (1) comparable corpora, (2) parallel corpora, and (3) multi-lingual corpora. The first type refers to two sets of texts written in the same language: the first set is composed of texts originally written in the source language, that is, non-translated texts, while the second set is composed of similar texts translated into the source language. The second type, parallel corpora, refers to a set of texts written in the source language and aligned with their translations into the target language. The third category, multilingual corpora, refers to a collection of the same texts written in different languages.

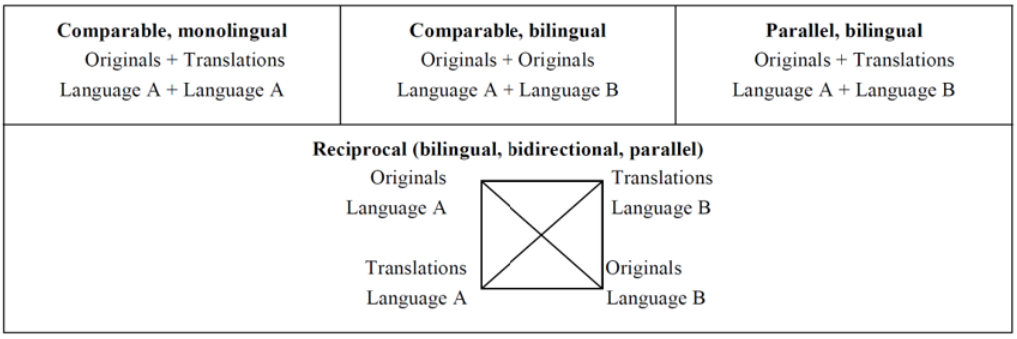
Zanettin (2014) proposes a typology similar to that of Baker, except that Zanettin includes more corpus categories and sub-categories (see Figure 2.1). He asserts that comparison is a distinctive feature of any corpora used for translation, denoting that a corpus should involve at least two distinctive varieties of texts to serve this purpose. As such, a monolingual corpus, for example, cannot contain only a set of texts in one language but at least two different varieties of texts in the same language. Taking into account the number of languages involved in the creation of corpora as the basis of the typology, Zanettin classifies corpora for translation into five main types as follows:

1. Monolingual corpora
2. Bilingual corpora (parallel or comparable)
3. Multilingual corpora (parallel or comparable)
4. Learner translation corpora
5. General reference corpora

According to Zanettin, it is important to differentiate between the sub-corpus types in this typology, namely the parallel and comparable corpora, highlighting two key differences. First,

because of the nature of parallel corpora, which necessitates the involvement of at least two distinct languages, they do not contain texts that are of a monolingual nature. Comparable corpora, on the other hand, may contain monolingual texts, in addition to bilingual or multilingual texts. Second, although the texts in parallel corpora—bilingual or multilingual—come in different languages, they share one thing in common: they have explicit translational relationship—one to one, or one to many— since these texts represent source texts and their respective translations in two or more languages. Zanettin clarifies that "this defining relationship can be either unidirectional, going from one source to a target language, or bidirectional, going both ways" (p. 11).

Figure 2.1.Diagram of different corpus types based on Zanettin (2014)



The rapid development of these corpora, their increasing size, and their ease of access encouraged researchers to explore various areas of inquiry, relying on authentic linguistic data to draw conclusions. While the list of such areas of inquiry in translation is almost endless, I will only focus on a limited set of examples of these areas below.

Among these areas is the study of the regularities found across translated texts. The quest for global or universal tendencies in translated language has attracted many scholars, who have investigated translations involving European languages, such as Finnish (Eskola, 2004;

Mauranen, 2004), French, (Cappelle & Loock, 2013), German (Becher, 2011), and non-European languages, such as Chinese (Xiao, 2010) and Arabic (El-Nashar, 2016).

Baker's (1993) study is a case in point and worth highlighting as one of the earliest studies in this vein. Relying on a corpus-based approach, she proposes that a constellation of features or patterns[2] appear to be repetitive across translated languages, features that are not evident in the original source texts. Referring to such features as *Translation Universals* (TU), Baker argues that through access to comparable corpora, we can "capture patterns which are either restricted to translated text or which occur with a significantly higher or lower frequency in translated text than they do in originals" (p. 235) and consequently "arrive at more global statements about the nature of translated text" (p. 236). Regardless of the criticism of these universals (see Pym, 2008), what distinguishes this corpus-based approach is that it is descriptive in the sense that all ideas generated about translation universals stem from actual authentic language rather than from prescriptive intuitive hypotheses of what translations entail.

Along the same lines as Baker, other researchers have used corpora to investigate linguistic aspects of translated language, however, looking at rather more specific than global features unique to translated language, such as the lexical, syntactic, and collocational properties of translated language. For example, the study of the lexical properties of translated language using corpora plays a key role in illustrating how translated texts diverge or converge from texts originally produced in the same language. Research in this area takes into account different measures to investigate lexical properties, such as token/type ratio, sentence length, lexical density, word frequency, and so on. In this area, Laviosa (1998), for example, explores whether

[2] According to Hunston (2022), the word pattern is common in corpus-based study. She argues that "its core definition might be 'an observed regularity', but the nature of that regularity is not fixed" (p. 140). Hunston offers a variety of definitions associated with the term along with examples.

the lexical patterns she found in an earlier work (1997)—namely, lower lexical density (use of few content words) and a higher proportion of high frequency words—pertaining to translated newspaper articles are global and would also exist in other types of translated texts. She illustrates that the two lexical patterns are replicated in narrative prose and asserts that while these lexical features—which she designates as "core patterns of lexical use"—were found only in two text types, they "may prove typical of English translated text in general" (p. 8).

Similarly, driven by a lack of research regarding the lexical properties of translated Chinese, Xiao and Dai (2014) used a corpus-based approach to examine whether translated Chinese texts differ from non-translated Chinese texts. Their study proposes that translated Chinese appears to exhibit less lexical density than texts written originally in Chinese, a difference that was found to be statistically significant according to statistical norms. This is seen in translated texts' overarching use of function words compared to content words. The results also revealed that translated Chinese tends to have longer sentence segment lengths compared to texts produced in Chinese.

While some scholars have studied the lexical properties of translated language, others have studied syntactic differences between translated and non-translated language across is found in multiple various languages, such as Arabic (Fattah, 2016), Chinese (Liu & Afzaal, 2021; Wang et al., 2023), and Spanish (Ramón, 2015). Inspired by Laviosa's (1998) work, McLaughlin (2009) follows a similar, but different, path. In her study, McLaughlin incorporates comparable corpora to examine the syntactic variations found in translated French, with a keen eye on dislocation structure. She suggests that translated French is inclined to have a lower frequency of dislocation tokens, less than half of what is normally exhibited in texts originally written in French. McLaughlin attributes this difference to two main causes: stylistic and pragmatic

functions. She argues that this repetitive feature in translated French may potentially impact the original construction in French over time and eventually lead to its loss (p. 15).

Using both monolingual and reference corpora, Bernardini (2004) investigates the use of collocations in translated and non-translated Italian texts. She maintains that Italian translators tend to use more collocations than authors producing text originally in Italian. The results exhibit that about 12% of the translated corpus has collocations that did not occur in the non-translated corpus. The results also reveal a recurrent pattern related to normalization or explicitation.

Researchers have also used corpora to study style. The study of style in translation has been investigated different language pairs, such as Arabic-English (Baker, 2000), Spanish-English (Saldanha, 2011), Russian-Finnish (Mikhailov & Villikka, 2001), and English-Chinese (Defeng, 2016). Baker's (2000) study is one of the earliest attempts to investigate the issue of style in translation. Using two different corpus types, namely the BNC and the ETC (English Translational Corpus), Baker draws a contrastive analysis between source texts originally written in English and those translated into English, with a particular focus on the use of the relative pronoun *that* with the two verbs *say* and *tell*. She concludes that the relative pronoun (that) appears far more common in translated English than in texts in the BNC.

2.3. Corpus Linguistics in Translator Education

With the unprecedented attention given to corpora in descriptive and empirical translation research, several researchers have recognized the role played by corpora in translator education (Wilkinson, 2005; Beeby et al., 2009; Hu, 2016; Baer & Mellinger, 2020; Liu, 2020). In this respect, Washbourne (2019) highlights that "[t]he use of corpora and other computational tools in teaching both translation and interpreting is now widespread" (p. 599). As Washbourne notes, teachers can use corpora not only for demonstration purposes but also for a range of educational

activities, including improving students' linguistic competence in the source and target languages, designing translation curriculum, assessing student translations, and designing translation tasks based on authentic data. Baer and Mellinger (2020) suggest that corpora, in particular, text-type specific corpora, "provide a more holistic understanding of how texts are made" (p. 1) and help students discern both macro- and micro-level textual features through a systematic comparison.

The rapid development of technology and its ease of access have now facilitated the continued integration of corpus technology into the translation curriculum. Both teachers and students can now capitalize on the wealth of information corpora offer for teaching and learning opportunities. Such information is not restricted to word meanings and is, in fact, contextual and authentic. According to Vintar (2008), "[t]he abundance of electronic texts on the web, available in most languages of the world and often multilingual, is just one of the reasons paper dictionaries can no longer be considered the primary source of translation-relevant information" (p. 153).

Hu (2016) suggests that the use of corpus to teach translation is an "innovation in translation pedagogy" (p. 178) as this novel approach allows teachers to offer creative learning opportunities associated with discovery learning. In this sense, learners are never looked at as passive recipients of translation knowledge. The use of corpora promotes creative thinking as learners analyze textual and translational patterns in both languages, discern how translators overcome specific translation problems, and exploit autonomous learning opportunities.

Nevertheless, corpora in translation have generally served more as a research tool for academics and less as an instructional resource. Various research studies have focused on theoretical topics, including understanding translation universals (Baker, 1993), studying lexical

features (Laviosa, 1998; Olohan, 2004) and syntactic features of translated texts (Olohan, 2001; Kruger, 2019), examining collocations (Kenny, 2001; Dayrell, 2007), and investigating semantic prosody (Tognini-Bonelli, 2001; Stewart, 2009), among many other areas. The use of corpora as an instructional tool for teaching translation has been explored more frequently from a descriptive viewpoint than from an empirical one. Several studies have illustrated how different corpus types, including monolingual corpora, comparable corpora, learner corpora, and DIY corpora, can be used as a main teaching and learning resource mainly theoretically (Alotaibi, 2017; Neshkovska, 2019; Laviosa & Falco, 2021), with very limited empirical research to support such claims, particularly in the case of parallel corpora (Liu, 2020). Therefore, more empirical studies are necessary to examine the potential of corpora, particularly parallel corpora, for teaching translation and translating. Such empirical, corpus-based pedagogical studies can contribute to our understanding of how large bodies of authentic texts can be utilized not only in conceptualizing what translation entails but also in using that knowledge for teaching translation as a professional activity that encompasses more than simply bilingual transfer.

According to Bowker (1998), the role of corpora in translator education comes into play when translation teachers have very limited time to prepare students for the industry to become, in Bowker's terms, subject-field experts. In fact, teachers do not have the luxury of focusing on a single domain; they usually find themselves helping students to translate texts in various subject matters, necessitating linguistic familiarity with field-specific terminology, idiomatic structure, style, and register, among other things. Therefore, Bowker argues for the potency of monolingual corpora as a solid tool for translation teaching as opposed to conventional resources. She maintains that helping students to translate with a corpus allows them to: a) have a better

comprehension of the subject field into which they are translating; b) find the correct terminology; and c) create appropriate idiomatic expressions that are specific to the topic in question. This is because "[t]ranslators using a corpus have access to a greater amount of data, which they can interrogate more easily" (p. 18) when compared to conventional resources like a dictionary.

Along the same lines as Bowker, Zanettin (2002) advocates for the implementation of corpora, whether monolingual, bilingual, or multilingual, in translator education. He argues that corpora as well as concordance programs not only help to enhance students' translation competence but also connect the translation student to the translator's real-world workplace. This is particularly important as it provides a situated-learning environment for students that imitates a professional setting. Zanettin makes the case that if the aim of teaching translation is to qualify students to become professional translators, then it is a high priority to establish a link between the reality of translation as a profession and the academic context in which translation is taught. As such, he stresses that translation curriculum designers should cater to this need and incorporate corpus-based teaching approaches into translation curricula.

According to McEnery and Xiao (2008), monolingual corpora prove helpful as a tool for teaching translation. They stress that this corpus type can serve as "a useful and effective reference tool and a workbench for translators and trainees" (p. 25). Vintar (2008) shares this view and suggests that monolingual corpora are "equally valuable" as any other corpus type for training purposes and can be utilized as "an important source of translation equivalents for specific expressions, technical terms or recent borrowings" (p. 154).

Beeby et al. (2009) demonstrate that the use of corpora in the classroom falls into two categories: *corpus use for learning to translate* and *learning corpus use to translate*. The former

category refers to a set of texts collected by translation teachers for instructional purposes, using corpora as a datapoint for teaching translation, from which practice-relevant examples are elicited. Such corpora can also be used to help students become aware of translation behaviors that correspond to specific translation problems, and to aid instructors in designing learning materials to address them. The latter category refers to teaching translation students the "how-to" of compiling and building their own corpora in order to foster autonomy in learning and to provide resources above and beyond monolingual and bilingual dictionaries. While the two uses of corpora are equally important, I believe the first category should be the initial concern for teachers since the latter is more advanced and requires greater familiarity with corpus tools. As such, teachers can teach translation with the assistance of a corpus at an early stage of teaching, and once students gain enough familiarity with corpora, they can be introduced to methods for compiling their own corpora.

Baer and Mellinger (2020) point out that a corpus-based approach to translation pedagogy enables students to elicit a better comprehension of text structure, rhetorical features, and genre for both the source and target languages. They maintain that using corpora "allow[s] for the systematic investigation of text-types or genres as a whole and allow[s] for identifying the macro-level features of specific texts" (p. 2). For this reason, the authors based their textbook on genre-specific and language-specific corpora in order to raise novice students' awareness of both micro- and macro-textual conventions, which students who rely solely on bilingual dictionaries often lack.

2.4. Corpus Types Used in Translation Education

Under this section, I will provide an overview of the empirical studies that have used corpora as a tool in translator education, reviewing how different corpus types were put into use

to assist students during the translation process. These empirical, corpus-based pedagogical studies contribute to our understanding of how such a large body of authentic texts can be utilized not only in discerning what translation entails and how translated texts differ from non-translated ones but also in teaching translation as a professional activity that encompasses more than simply a bilingual transfer.

2.4.1. Monolingual Corpus

One of the early empirical studies illustrating the potential of corpora for translation teaching is Bowker (1998). Bowker investigates the impact of corpus use in translation classes as opposed to conventional resources. In her experimental study, Bowker hypothesizes that helping students to translate with a corpus allows them to a) have a better comprehension of the subject field into which they are translating and b) make fewer linguistic and translational errors compared to those who use conventional resources. She concludes that students who translated with the assistance of a monolingual corpus exhibited a higher level of translation quality and an enhanced comprehension of the ST text subject field. They had fewer errors in terms of terminology and idiomatic expression choices compared to their counterparts who used only conventional resources.

Another often-cited study is Stewart (2000), which examines the efficacy of using a target language monolingual corpus for teaching translation into an L2. Since most translation students translate into their native language, students who are rendering texts into their L2, Stewart argues, would benefit from using a corpus to enhance their translation. Unlike translating into their L1, students translating into their L2 are required to have familiarity with a range of knowledge areas, including terminology, genre-specific features, and the subject matter, among many others. In certain text types, such as tourist brochures, the language tends to be highly

formulaic, and some phrases are context-bound and text-specific. Stewart concludes that students who used the BNC corpus while translating into their L2 were able to produce more native-like and fluent translations in terms of their selection of terms, expressions, and collocations.

Another advocate for using monolingual corpora in translator education is Coffey (2002), who notes that a source language monolingual corpus has the same benefits as any other corpus type. Such a corpus, as Coffey proposes, has a reciprocal benefit for both teachers and student translators. For teachers, a SL corpus can be used for a wide range of activities, from designing translation materials for demonstration and developing class activities geared toward enhancing translation competence to providing various tasks for assessment purposes. For students, this corpus type can be used as a translation aid since it is rich in linguistic information. Students can use such a corpus to better understand and verify some of the linguistic features that are typical of the source language.

Similarly, Ramos and Moreno (2016) incorporate a monolingual corpus for teaching legal translation. They argue that monolingual corpora are essential in teaching legal translation since they "help trainee translators to produce a functionally adequate and acceptable target language text" (p. 105). In their study, students translated legal texts from Spanish into their L2, English. Ramos and Moreno note that using a monolingual legal corpus helps students not only at the textual competence level but also at the psycho-physiological competence level since the use of a monolingual corpus allows them to become subject matter experts in the legal genre, and subsequently gain more confidence as they translate in that genre. They also maintain that the use of the legal corpus is evidently helpful in overcoming terminology and phraseology problems.

Zeitoun and Dakik (2018) also propose that using a monolingual corpus for L2 translation is effective and yields promising results. In their experimental study, translation students used the Corpus of Contemporary American English (COCA) for their translations. Zeitoun and Dakik report that students translating with the assistance of the corpus demonstrated high quality translations and improvement compared to their performance during the pre-testing phase. The results also show that students managed to overcome issues related to translating collocations and phrasal verbs.

In a more recent endeavor, Alshubaily and BinSultan (2023) consider monolingual corpora as an effective tool for teaching L2 media and political translation. They suggest that using monolingual corpora has far more benefits than using traditional resources such as bilingual dictionaries. They also note that incorporating corpora in teaching translation not only helps "offer a diverse range of real-world language examples that aid trainees in grasping language nuances and effective communication," but also "fosters critical thinking and analytical skills" (pp. 143-144). Like Zeitoun and Dakik (2018), Alshubaily and BinSultan incorporated COCA in their experimental study. Their results indicate that students who used COCA outperformed their counterparts who used dictionaries, particularly in terms of terminology and collocations.

2.4.2. Learner Translation Corpora

Learner translation corpora (LTC) refer to a collection of student translations along with their corresponding source texts. Obrusnik (2023) differentiates this corpus type from learner corpora (LC), which consist primarily of "a collection of L2 student essays or other assignments" (p. 161). Obrusnik stresses that a key distinction between LTC and LC pertains to the language variety they represent. In other words, LTC contain translated language and thus by default

necessitate the inclusion of bilingual or multilingual translations, whereas LC contain learner language, or interlanguage (Stewart et al., 2004), comprising only texts written in the learners' L2.

LTC constitute a valuable resource to inform both the theory and practice of translation for a variety of ends. Researchers such as Granger (1993, 2003), Bowker and Bennison (2002), Olohan (2004), and Granger and Lefer (2020) have developed keen interest in LTC. Granger and Lefer (2020), for example, demonstrate that this corpus type has numerous benefits for translation pedagogy. The most obvious of these is creating an unlimited number of remedial exercises that are geared toward addressing "attested areas of difficulty" in which students frequently err and, in so doing, assist other potential translation students in avoiding such errors (p. 1149). Granger and Lefer also highlight the capability of LTC to help students construct their own learning and engage in problem-solving activities. Among the examples they mention is providing students with some erroneous translations from the corpus and asking them to identify the errors and propose professional solutions to overcome them.

Granger and Lefer (2020) maintain that, while much of the research on LTC seems to be concerned mostly with the pedagogical applications of this corpus type in the classroom, data from such corpora can also be leveraged to inform translation research in the same way other corpora already have. Research on parallel corpora, for example, offers insights into the nature of translations by professional translators; in the same way, LTC can tell us more about the nature of learner translations (Bowker and Bennison, 2002). Kutuzov and Kunilovskaya (2014) share a similar viewpoint and suggest that LTC are a valuable resource for understanding student translational behaviors and, therefore, can be used to investigate a wide range of topics, as demonstrated in the following examples (pp. 315-316):

1. exploring variation and choice in translation when different translations of the same source are compared;
2. comparing learner translator output to native data, which can lead to conclusions about non-nativeness and 'translationese'; the translator's inter-language and the consequences of the constraints of translation as a communicative activity as opposed to free speech;
3. exploring interdependence between the translation characteristics and various meta data (direction and conditions of translation, source text genre);
4. analysis of concordances of multiple translations (comparing several translations to sources) that can help to develop and test hypotheses about error-prone linguistic items ("problem areas");
5. computer-aided error analysis of the most common translation errors to draw conclusions about the weaker components in the current translator population competences; this strand of research can be extended to include the study into the didactics of translation quality assessment (TQA);
6. apart from learner corpora and translation studies research, the results of which can be applied in the curriculum and materials design, there are numerous ways in which the corpus can be directly used as a teaching and learning aid.

In regard to pedagogical applications, Castagnoli (2016) uses a learner corpus, MISTiC (Multiple Italian Student Translation Corpus), consisting of 480 translations to examine cohesion in student translations, particularly looking at the rendition of intercausal linkage. Castagnoli finds a clear tendency among students to violate the regularities of Italian connectives by adhering to the ST connectives. She argues that such results indicate the variation between Italian

and English in this pragmalingusitic domain of language, therefore underscoring the importance of allocating considerable attention to this area in translator education.

Similarly, Kunilovskaya et al. (2018) rely on LTC to compare three varieties of language: Russian translations by learners, Russian translations by professional translators, and non-translations. Their study suggests learner Russian translations differ from both non-translated Russian texts and professional translations. First, learners tend to use longer sentences compared to original texts written in Russian, while professional translators seem to be more flexible and adjust their translations to comply with the norms of Russian sentence average length by splitting sentences. Second, learner translations appear to have a low lexical variation in terms of type-to-taken ratio compared to professional translations and non-translated Russian.

In another study, driven by the need for an empirically informed translation curriculum, Kunilovskaya et al. (2023) use *RusLTC* (Russian Learner Translator Corpus) to analyze student translations in order to find the most frequent occurring errors, resulting from error-prone source text items. With that list generated, their goal is set out to evaluate 180 English-to-Russian translation textbooks used for teaching translation and assess whether these textbooks prepare students for such inherently difficult source text areas. Their results show that there is a gap between both in the sense that these textbooks appear to focus on English grammar as an intrinsically difficult area for native Russian translators, while results from the corpus tend to reflect that the majority of the errors are lexical rather than grammatical. Kunilovskaya et al. argue that

> the comparison of the problems attested in learner translations and those hypothesized in the textbooks (as well as covered in act al training received by translators) suggests that there is room for adjusting teaching materials to actual students' needs. We demonstrated

> that a wide range of SL items, which our students struggled with most, are under-represented in the textbooks and neglected in training (…). This might call for a change in the teaching methodology used to address them [since] it is crucial to understand where the current students make the most errors to allocate training time and effort effectively (pp. 23-33).

2.4.3. DIY Corpora

This corpus type refers to a group of texts compiled on a random basis to serve a specific purpose or need. It is also small in size and is no longer needed when the task for which it was created is accomplished. This is another corpus type that has been extensively used in the area of translation education. While this corpus has several designations, such as disposable corpora, ad hoc corpora, virtual or ephemeral corpora, the acronym *DIY*, which stands for Do-It-Yourself, and the designation *ad hoc* are the most common (Krüger, 2012).

Several translation researchers have discussed the design issues and stages involved in the creation of DIY corpora (Zanettin, 2001, 2014; Varantola, 2003; Krüger, 2012; Baer & Mellinger, 2020). Most agree that DIY corpora have several advantages for translation education. First, they are relatively easy to construct since the internet is the key source for creating the collection of texts. Second, because they are ad hoc, less effort goes into text selection compared to other corpus types. However, this does not suggest that they are of lesser quality. Third, they are helpful in addressing specific translation problems related to, for instance, text types, terminology, and collocations since they are created to deal with a specific issue. Fourth, depending on the purpose of their creation, DIY corpora can include monolingual, parallel, or multilingual texts.

In the context of translator education, Zanettin (2002) made use of this corpus type for the purpose of improving students' translation with regard to terminology, collocations, and phraseology. In his experiment, students were involved in creating a DIY corpus over several stages, during which they refined it by adding relevant texts and deleting those that had no relevance to their translation assignment. The corpus they created included around 50 texts and had over 30,000 words. Zanettin contends that the participants found this corpus more helpful during translation than other conventional resources. Furthermore, the study illustrates that this corpus contributed to the overall improvement of students' understanding and translation of specific text types.

In a recent study, Araújo and Aguiar (2023) note that teaching students to create a DIY corpus is an essential component of translation pedagogy. Such a skill allows students to foster learning autonomy and the ability to cope with challenges as they enter the market. Araújo and Aguiar note that a DIY corpus not only allows students to become familiar with topics outside of their specialty but also suggests "different ways of reusing resources, such as word clouds and digital glossaries" (p. 110) to help them in other translation projects dealing with the same subject matter.

To help guide the creation of a DIY corpus, Araújo and Aguiar propose a three-step methodology, which they implemented in an experimental study at the University of Minho. The steps include pre-translation, translation, and post-translation. In the initial phrase, pre-translation, students carried out three tasks involving compiling relevant source texts along with their translations, which were pertinent to the subject domain, followed by creating a translation memory and term extraction. In the second phase, students translated some source texts using MemoQ. During the third phase, students completed two tasks: one involved generating a word

cloud, the other involved creating glossaries. The goal of these tasks, the authors suggest, is to "to provide students with a transversal, multimodal education that promotes creativity (…), and deepen their understanding of the specialized terminology in a given area" (p. 114). Based on a survey distributed at the end of the course, students reported that learning to create a DIY corpus allowed them to gain notable proficiency not only in translation skills, but also in instrumental and multimodal literacy skills.

2.4.4. Parallel Corpora

Parallel corpora refer to a set of source texts along with their corresponding translations into a target language. Several descriptive studies illustrate the potential of incorporating this corpus type into translator education (Pearson, 2003; Frankenberg-Garcia, 2002, 2012; Hu, 2016; Laviosa & Falco, 2021). In these studies, researchers argue that teachers have the opportunity to offer authentic examples from translated materials rather than from made-up examples, allowing students to navigate through a repository of examples related to a given translational phenomenon and put their analytical skills to the test. These tangible manifestations of translation theories encourage learners to think, argue, and raise questions about the examples they find, consequently moving them toward a more active, expressive, and dynamic approach to learning (Liu, 2020; Laviosa and Falco, 2023).

Laviosa and Falco (2023) note that parallel corpora also play an indispensable role in the development of classroom activities. Teachers can design learning tasks with the purpose of promoting learners' acquisition of translation skills and their understanding of translation through authentic texts. These authentic texts offer teachers the opportunity to move away from artificial, made-up language and to involve students in exploring and solving practice-relevant translation problems found in different texts and text types. Additionally, such authentic texts not

only allow students to be involved in real translation tasks, while also allowing them to observe what Sinclair (1991) describes as “language in use” and to see how it is translated.

In the same vein, Liu et al. (2023) illustrate that integrating a parallel corpus in translator education allows teachers to promote learners’ inferencing skills by discerning micro- and macro-textual features found in both the source texts and their translations. This is because, unlike monolingual corpora, parallel corpora have the privilege of being aligned most often at the sentence level with a bidirectional, simultaneous display of the source and its corresponding target texts. Thanks to the contextualized data packed in parallel corpora, learners have the capacity to engage in contrastive analysis not only to infer the similarities and differences between the source and the target, but also to discern the changes that occur during the translation—changes that could be attributed to linguistic regularities or socio-cultural variables between the two divergent languages and cultures. As Pearson (2003) notes,

> [students] have to gauge how much of the material in a source text is directly transferable to the target language, how much of it needs to be adapted or localized in some way, whether any of it can, or indeed should, be omitted. The answers to questions of this nature cannot be found in comparable corpora because these issues never arise in a monolingual text-producing environment. They only arise because of the constraints of a text composed in another language (p. 17)

Problems in translation could result from an ill-advised choice related to language (terminology, collocation, syntax, semantics, etc.), culture (misrepresentation of cultural and social variables, cultural peculiarities, etc.), lack of equivalence (domain-specific words), adequacy or fluency issues, and so on. While these problems can be addressed in a traditional translation class, I hypothesize that parallel corpora allow learners to explore these problems

from a different vantage point. First, as students apply their intuition to overcome specific translation challenges, a parallel corpus provides them with a means for testing the validity of their intuition by comparing them with the solutions offered by expert translators. Second, unlike a bilingual dictionary, a parallel corpus has a more comprehensive outlook as it presents solutions to problems often in more than one context, and in so doing, makes students aware of various solutions to the same problem. In other words, many translation problems afford more than one possible answer, depending on the nature of the context in which they occur. Polysemous words are a great example since their meanings are often context-bound, where one meaning fits in a certain context but not in another.

Despite the benefits of parallel corpora discussed above, there is a dearth of empirical studies on the use of parallel corpora in translator education. In other words, there is little that has been done to incorporate parallel corpora in actual translation education contexts. The scarcity of empirical studies of this corpus type is perhaps attributable to the lack of available and accessible parallel corpora (Liu, 2020), due to the inherent difficulty of creating and aligning them (Bowker, 1998). Parallel corpora have an advantage over monolingual corpora and comparable corpora in the context of translator education. Vintar (2008) stresses that

> [t]he most valuable corpus type, often designed explicitly for translators, is of course the parallel corpus, giving each language segment in two or more languages. By offering translations of segments instead of equivalents of words, a parallel corpus shifts the translator's attention from a lexical item to an item of meaning (p. 154).

Among the few empirical studies is Aston (1999), which advocates for using parallel corpora for training translation students. He maintains that monolingual and comparable corpora—despite their benefits in the educational context—may add further difficulties when

consulted by students to affirm their intuition with regard to certain translation issues for two reasons. First, consulting such corpora is time-consuming since they do not offer direct translation solutions and, thus, require additional checking. In other words, students need to ensure that what they actually retrieve from these corpora corresponds to what they intended to look for. An unknown word, for instance, may have multiple hits in several contexts in these corpora, and, as such, students need to verify that the meaning they arrive at when consulting these corpora is in accordance with the context of the same word in the SL text they are translating.

Second, since the information they retrieve from the monolingual corpora is not in the students' mother tongue, learning and translating based on these two corpus types become "error prone" and are fraught with the risk of misinterpretation of the information they obtain, consequently leading students to arrive at wrong conclusions and build solutions around them. Aston (1999) maintains that the solution to this dilemma is to rely on parallel corpora since they have a direct, observable, and comparable language and context. He argues that "[g]reater certainty as to the equivalence of particular expressions can be obtained by using parallel corpora, consisting of original texts and their translations," and continues to say that "[u]sing such a corpus can also have a positive impact on learning. Where a variety of parallel realizations are encountered, this may help learners to distinguish between different contexts of use and reduce their tendency to think in terms of one-to-one equivalence" (pp. 299-301).

McEnery and Xiao (2008) share a similar perspective. They believe that parallel corpora have greater benefits for translation students than monolingual corpora. McEnery and Xiao suggest that this corpus type "provide[s] a workbench for training translators" and serves as an indispensable instructional tool for several reasons. First, parallel corpora help trainee translators

become aware of the cultural and linguistic differences between the source and the target languages. While it is true that such awareness can be achieved with other corpus types, the two-way directionality in parallel corpora offers far more opportunities to attend to cultural differences between the source and target cultures and to acquire cultural sensitivity and competence at a faster pace. Second, parallel corpora help students find exact matches for words and expressions used in varying contexts since they have more precision in locating equivalents in comparison with other corpus types. Moreover, some linguistic expressions have no explicit correspondence in other languages; they need creativity in transferring them into a target language. In such cases, parallel corpora play a key role in "offer[ing] a systematic translation strategy for linguistic structures which have no direct equivalents in the target language" (McEnery and Xiao, 2008, p. 26). Nevertheless, McEnery and Xiao also attend to the fact that using parallel corpora only as a datapoint for teaching is not sufficient and must be supplemented with other types of corpora.

Nebot (2008), for instance, investigates the effectiveness of using parallel corpora for legal translation education. He finds that this approach is advantageous for several reasons. First, using a parallel corpus helps the trainees become more proficient and facilitates recognizing textual and terminological patterns that are specific to the given text type. Second, in addition to being helpful in terms of text output quality, adopting a parallel corpus as a translation aid also assists students in spending less time on their translations than they usually do using other traditional resources. Last, students exhibit higher self-confidence when translating with a parallel corpus, which is a core goal of learner-centered education.

In the same vein, Frankenberg-Garcia, in two different studies (2002) and (2012), illustrates how using a Portuguese-English parallel corpus, *Compara*, can lead to improvement in

students' translation performance. She presents a set of translation tasks elicited from a parallel corpus that teachers can use in order to direct students' attention to certain translation strategies used by professional translators. Frankenberg-Garcia argues that a parallel corpus allows students to become aware of translation norms when comparing the language of the source texts with their respective translations. In other words, simultaneous access to the source and target texts increases the opportunity for students to notice translator behaviors in managing the sociocultural constraints of translation.

In an empirical study, Frérot (2013) investigates the role of using parallel corpora in translator training. The study was conducted on translation students with French as their L1 and English as their L2. Running the experiment for 12 weeks, Frérot found that using *Multitrans*, a translation corpus tool, as an instructional tool for teaching translation significantly improved students' performance and enhanced the quality of their translations. When using the parallel corpus, students were able to navigate through an abundance of strategies implemented by professional translators for verbs that lacked direct equivalence in the target language.

In a more recent empirical study, Liu (2020) incorporates a Chinese-English parallel corpus in teaching translation to university level students. Liu's study is an important one because he examines the role of the parallel corpus not only in L2 translation, but also in translating into the students' native language. Based on the results, Liu asserts that using the parallel corpus boosted students' translation quality in both directionalities, with observable quality improvement on the level of spelling, terminology, word choice, collocations, and style. Liu attributes this improvement to

> one-to-one sentence alignment design in the parallel corpus [which] means that students can easily identify solutions to translation problems once translation instances can be

obtained in the corpus. Because of this, parallel corpora are useful for doing translation, particularly in a translation training context in which students are not skilled in mediating between two languages and cultures (p. 140).

When taking into consideration the benefits documented by the above descriptive and practical studies of parallel corpora, it is safe to make a few non-prescriptive assumptions about such corpora as a datapoint for teaching translation, namely:

- They are effective in helping students enhance their translation competence;
- They allow students to notice different translators' behaviors with regards to specific linguistic and cultural difficulties in the texts they translate;
- They also allow students to navigate and search through a full parallel context rather than isolated segments;
- They improve students' translation output (in terms of both quality and speed) as a requirement for the industry; and
- They provide teachers with authentic data to design learning materials.

2.5. Summary of the Chapter

In this chapter, I offered an overview of the development of the notion of corpus from corpus linguistics through its adoption in translation studies. Then I highlighted several translation areas of inquiry that primarily capitalized on corpus linguistics for different purposes. This was followed by a detailed discussion of how interest in corpus-based approaches began to emerge in translation pedagogy. I detailed several studies that empirically used different corpus types for pedagogical purposes, such as monolingual, comparable, and DIY corpora, and how such corpora have made major contributions to translator education, In my discussion, I also highlighted that unlike different corpus types, parallel corpora have been less empirically

examined in the context of teaching translation, creating a gap that requires further attention. Finally, I concluded with showcasing a few empirical studies that used parallel corpora as a main tool for teaching translation, highlighting the need for more empirical research using parallel corpora in teaching, particularly for Arabic-English translation.

CHAPTER 3: METHODOLOGY

This chapter begins with an overview of the experimental design used in this empirical study. This is followed by a discussion of the participants involved, along with a discussion of the ethical considerations taken into account prior to the commencement of the experiment. The chapter also provides a detailed description of the translation course students were enrolled in, together with a discussion of the tools used to carry out the experiment. The chapter concludes by reviewing how data obtained from the experiment is analyzed.

3.1. Experimental Design

This study adopts a quantitative methodological design, used to examine the impact of adopting a PCBT on the quality of student translations. Specifically, it also follows a between-subjects approach with a posttest-only design, which is sometimes referred to as a *randomized posttest-only control group* design (Baldwin, 2018; Edmonds & Kennedy, 2017). This research design includes an experimental group and a control group, both of which are compared against each other on a posttest criterion only.

Our intention was to follow a between-subjects pretest-posttest design, which, as its name suggests, includes a pretest measure in addition to a posttest. However, due to some constraints I encountered during the execution of the pretest (see Section 6.3), I had to eliminate the pretest from the experiment since I was not able to collect reliable data. With that said, it is worth noting that a randomized posttest-only control group design is still valid and common in educational and psychological research (Baldwin, 2018).

Martella et al. (2013) argues that the posttest-only control group "effectively controls for the same (…) threats to internal validity as the pretest–posttest control-group design" (p. 143), illustrating that a key disadvantage of this design is that is does not allow researchers to determine group similarity or equivalence before conducting the experiment. However, ensuring group equivalence was maintained and compensated for by three measures. First, I administered the department's English Proficiency Exam (EPE) to assess the participants' linguistic proficiency to ensure that there were no major discrepancies in their linguistic abilities (see Section 4.1.1.1). Second, I conducted the experiment with students who had neither studied translation before this course nor had any prior professional translation experience. Third, I followed a random assignment of participants between the two groups. Edmonds and Kennedy (2017) suggest that "if random assignment is used [in a posttest-only control group design], then group equivalency is 'secured'" (p. 44).

3.2. Participant Selection

3.2.1. Ethical Considerations

Prior to conducting the study, the researcher successfully completed the Collaborative Institutional Training Initiative (CITI) training course on March 21, 2022. The researcher then reached out to the concerned institution in Saudi Arabia where the study took place to obtain approval for conducting the study over the summer. Through a Zoom interview, the researcher discussed with the Head of the English Department the purpose of the study, the planned methodology, the ethical considerations, and the potential perceived outcome of implementing the study and its contribution to professional development. Permission to conduct the study was granted on June 10, 2022. Once permission was granted, the researcher obtained the Institutional Review Board's (IRB) consent to carry out the study on Tuesday, July 19, 2022, from the Kent

State Office of Research Compliance. Two weeks prior to the experiment, an online recruitment letter (Appendix A) and a consent form were emailed to all registered students (see Appendices B for the control group and C for the experimental group).

To maintain privacy and confidentiality in this study, the names of the participants as well as the institution were anonymized. This was also agreed upon with the head of English department. All participants' names were anonymized with numbers (TR1, TR2, TR3, etc.). In addition to maintaining confidentiality, anonymity helps to avoid any potential bias—that is, blinding both participant names and the institution would help to prevent any possibility of bias based on prior knowledge or assumptions about the participants. In the same way, all tests for both groups (control and experimental) were mixed and coded with numbers so that there would be no indication as to whether the test under evaluation was a test from the control or experimental groups. Such measures help to eliminate reviewer bias.

3.2.2. Participants' Demographic Data

A total of 59 students participated in the study. Of the 59 students, only the results of 35 students were considered. Of the 24 excluded students, three withdrew from the experiment but still attended the course as a regular course, three were excluded due to discrepancies between their drafts and final translations (see Section 5.3. for more details), nine failed to attend the posttest, five withdrew from the course, and four had prior translation experience; therefore, their results were excluded. The participants were all undergraduate male students at a local Saudi university. They were in the third academic year of a five-year program in English. They had already studied intensive English during the first year and linguistics and literature in the second year. Their level of English proficiency was between intermediate and upper intermediate on

average (approximately B1 to B2 on the Common European Framework of Reference for Languages (CEFR)), according to the department's English Proficiency Exam (EPE).

The participants were assigned randomly to two groups: a control group and an experimental group. Following random assignment is important "for the purpose of ensuring that subjects in each group will have similar characteristics—that is, that they will be equivalent" (Coleman, 2018, p. 174). Equivalence, as Coleman notes, does not imply that the participants are all identical. It simply refers to the fact that the individual variations among the participants are equally distributed and that no preselection of participants is involved. In other words, the participants have the same chance of being in either group. In this study, the participants' names were blinded and replaced with numbers. They were then distributed to the control (A) and treatment (B) groups, using an online random assignment tool[3]. Of the 35 participants, 18 were assigned to the experimental group and 17 to the control group.

3.3. Course Description

The participants were all enrolled in the *Translating Text Types* course, the first of a four practice-course sequence in their academic roadmap. Two translation sessions took place per week; each session lasted an hour and 50 minutes. This Arabic-English translation course is non-specialized and revisits some of the fundamental concepts of translation theory that were covered in the earlier course, *Theories and Applications of Translation*. The course is comprised of the following four modules: 1) media translation, 2) scientific/technical translation, 3) commercial and financial translation, and 4) legal translation. Each of these modules is covered in two weeks.

The course consists of a series of readings on different topics, drawn from a variety of scholarly sources and are arranged by the English Department. It also offers practical exercises in

[3] https://www.randomlists.com/random-assignment

each model where students have the opportunity to analyze and translate short texts into their L2[4], i.e. English, to practice implementing what they learned in each of the modules. Since the original exercises in these readings are in language pairs other than English-Arabic, students were provided with exercises that were modeled on the exercises from the assigned readings to practice on. Both the control and experimental groups received the same instructional materials, i.e., the same readings, tasks, in-class activities, quizzes, and assignments. The mode of instruction for this course was in-person. While students in the control group relied solely on dictionaries, students in the experimental group made use of an online Arabic<>English parallel corpus for their translations (see Section 3.6.1. for more on the corpus).

3.4. Data Collection

3.4.1. Translation Exam

After the completion of the eight-week semester, the posttest was administered for both groups in the ninth week. The posttest allowed the researcher to compare the performance of both groups to see if using a parallel corpus had any impact on the quality of participants' translations. It included a short, non-specialized text of 286 words to translate from Arabic into English (Appendix E). The text, titled مفهوم البيئة [The Environment], was selected from a curated list of topics originally composed by the English Department. The participants were given two hours to complete the exam. For the control group, students were allowed to have access to a

[4] L2 translation is a common practice in most Saudi universities. While this practice has been challenged in the literature of translation pedagogy by some scholars such as Newmark (1988), Gouadec (2007), and Sofer (2009), other scholars have argued otherwise such as Pokorn (2005), Kearns (2006), and Zanettin (2009). In fact, translating into a L2 is nowadays more common in many local markets such as Saudi Arabia. Conducting a survey on translation directionality among professional translators, Piroth (2015) found that more than half of the surveyed participants translated into their L2. As Zanettin (2009) argues, "that translators translate only into their L1 is more of a myth or an ideal than a reality" (p. 212).

bilingual dictionary, following the norm of the English department. For the experimental group, students had access to the parallel corpus they were trained on during the semester.

The posttests for both groups were graded by two translation teachers working at the same university, who had no earlier acquaintance with participants and not with the group they were grading to eliminate any bias. Rater One has a Ph.D. in Applied Linguistics and has been teaching and assessing translation for over 10 years. Rater Two holds a Ph.D. in Translation Studies with a six-year experience in translation teaching. For the assessment of the posttests, they used an error analysis (EA) framework for standardized error marking commonly used in translation assessment (Section 3.5.3.). The teachers had familiarity with the framework; however, to ensure consistency of assessment, both teachers received training prior to grading on using the adapted version. The training consisted of three sessions, lasting 60 minutes each. The first session involved an overview of the adapted version of the framework, in which error types and scoring criteria were reviewed, and which was reinforced by a number of examples of error corrections. The second and third sessions included hands-on, guided tasks that involved assessing several sample translations using the adapted version, followed by an in-depth discussion of the teachers' corrections with an attempt to reconcile any discrepancies and foster consistency in rating.

3.4.2. Survey

Upon completion of the experiment, the participants in the experimental group were assigned a close-ended survey, which helped the researcher elicit the participants' overall attitude toward the implementation of the intervention in the translation course. The survey was adapted from Liu (2020) and addressed the following: 1) students' evaluation of the parallel corpus, the AEPC; 2) their perceived effect of using the AEPC; and 3) their approach to using the AEPC as a

tool for translating. The participants' responses were recorded using a 5-point Likert scale as follows: strongly agree, agree, neutral, disagree, and strongly disagree.

The use of surveys in translation research is not uncommon. It is a popular method in sociological research in general. In fact, surveys are sometimes the most convenient method to elicit data and can be used to obtain participants' responses on a range of translation-related topics, such as the implementation of new technologies, exploring beliefs and attitudes, and assessing translation quality, to name a few (Saldanha and O'Brien, 2013). Incorporating surveys, like the one in this study, assists with triangulating[5] data collection so as to provide additional support and more input on the study, and in so doing, helps the researcher to "facilitate validity checks of hypotheses, anchor findings in more robust interpretations and explanations, and allow the researcher to respond flexibly to unforeseen problems and aspects of the research" (Baker & Egbert, 2016, p. 3). Likewise, Saldanha and O'Brien (2013) maintain that data triangulation in translation research is significant, assists in offering enhanced reliability and validity, and, therefore, contributes to a higher quality of research.

In addition to being common in translation research, surveys are a convenient tool for collecting structured data from a large pool of participants to examine "trends, attitudes, or opinions of the population of interest" (Edmonds and Kennedy, 2017, p. 133). They are convenient in the sense that, when compared to interviews, they typically require less time in both collecting and analyzing the responses obtained. However, designing surveys is very complicated and susceptible to errors and necessitates due care when wording the questions or statements. Poorly worded questions or statements can jeopardize the overall validity of the survey and, consequently, be an unreliable source of data. Therefore, it is essential that surveys

[5] Shreve and Angelone (2010) define triangulation as "the use of two or more data acquisition methodologies within a single study to improve the quality, validity, and reliability of research findings" (p. 6).

be given mindful consideration in the initial stage of design so that, when worded appropriately, responses can be generalized and extended to larger populations.

3.5. Translation Quality Assessment (TQA)

3.5.1. Error Analysis (EA)

James (2013) argues that despite the criticism of error analysis (EA), which peaked in the mid-1970s leading to its recession and near abandonment, EA was revived and received a new "lease on life" in the early 1980s due to a renewed interest in understanding learners' errors. This revival came as a result of the recognition of the role EA plays in offering valuable insights into the nature of learner language, or what or Selinker (1972) designates as *interlanguage*, allowing researchers to obtain a deeper understanding of learners' language development over time. James emphasizes that "the scope of EA is wide and widening," (p. 25) and is now implemented in many diverse areas of inquiry, such as forensic linguistics, instructional science, language loss, and language change.

EA also made its way toward translation studies. Several researchers (Duběda & Obdržálková., 2021; Ilani & Barati, 2016; Tsai, 2023) have recognized its value and regarded it as a useful tool that informs both translation pedagogy and research. This is evident in the remarkable growth in publications of books (Alenazi, 2022; Almahasees, 2021), journal articles (Duběda & Obdržálková, 2021; Soltani et al., 2020), and dissertations (Alenazi, 2021; Na, 2005) in translation incorporating error analysis as a key tool for investigating a broad range of topics. In the context of translation pedagogy for instance, EA offers key insights into recurring errors as areas of difficulties or challenges that students often encounter. EA allows teachers to identify and classify such errors according to their type (e.g. language error or translation-specific errors), helping them to construct remedial interventions to help students overcome them in translation.

On this last point, Neubert and Shreve (1994) draw the distinction between language errors and translation errors, arguing that

> What rightly appears to be linguistically equivalent may very frequently qualify as 'translationally' nonequivalent. And this is so because the complex demands on adequacy in translation involve subject factors and transfer conventions that typically run counter to considerations about 'surface' linguistic equivalence (p. 415).

Therefore, EA, while once sidelined, has found its way back into translation studies and is now widely integrated into translation instruction as a key method for evaluating language proficiency as well as translation competence. In what follows, I will identify and review how the definition of errors is approached in translation studies.

3.5.2. Definition of Errors

Since much of the discussion and analysis deals with translation errors in this study, it is important to operationalize what an error entails in translation. Defining translation error is not, in fact, straightforward, and the term has no univocal meaning in the literature. Different theoretical approaches have been taken in defining translation errors (Hansen, 2010). Hansen argues that defining a translation error is not merely confined to the concept of a mismatch between a source text and its corresponding target one. He suggests that, while linguistic equivalency may be maintained, errors may exist due to other considerations, such as a breach of a translation brief or a norm in a target culture.

Kupsch-Losereit (1985) offers a functionalist approach in defining translation errors. He looks at the relationship between the ST and the TT based on the functional consistency they bear and, in so doing, gauges the linguistic correctness of a translation on the basis of the "functional adequacy" of the translation. Kupsch-Losereit proposes multiple criteria for defining

translation errors, the first of which is “an offence against: (1) the function of the translation (…)” (p. 172) because “the translation and the original should correspond to one another (…) with due regard paid to the perspective functional purpose” (p. 174).

Like Kupsch-Losereit (1985), Nord (2005) considers translation errors from a functionalist standpoint, asserting that it is essential to take the *skopos* of translation (Reiss & Vermeer, 2013) as a major criterion in translation assessment, and, therefore, negligence in satisfying the functional adequacy of a translation is considered a translation error. She argues that any “expression or utterance is not inadequate in itself; it only becomes inadequate with regard to the communicative function it was supposed to achieve” (Nord, 2018, p. 68).

House’s *Translation quality assessment: past and present* (1997, 2015) presents a rather similar viewpoint. However, she argues that a functionalist approach to quality assessment that focuses entirely on the target culture and disregards the ST is “fundamentally misguided” (p. 69), because it neglects the significance of ST’s intended function. House contends that translation errors are determined based on the type of translation intended, which she classifies as either covert or overt translation. In covert translation, the TT reads as if it were an original, offering as an example a tourist booklet. In this type of translation, she claims, functional adequacy and text genre take primacy since both the ST and TT are treated equally. Therefore, failure to recreate the function of the ST counts as a translation error.

In overt translation, however, a ST is meant to address a specific source culture audience and, as such, is not equal to the TT. Giving an example of political speeches, House contends that seeking a functionalist approach in assessing this type of translation can be problematic. This is because a “direct match of the original function of the source text is not possible in overt translation” (p. 55) since the ST and TT’s communities are different. She suggests that in such a

case, translators should cater to what she terms “a second-level function” (p. 55), i.e., adjusting the TT’s equivalence on the level of language rather than function. Doing so allows “members of the target culture [to] eavesdrop” (p. 67) on the ST and appreciate its function, despite being culturally distant. In this type of translation, translation errors arise from a failure to match the ST with the TT on lexical, syntactic, and textual levels.

Other scholars, however, have followed more practical, product-oriented approaches to operationalizing translation errors. Among them is Pym (1992), who classifies errors as binary and non-binary. The first category refers to errors that are obvious and can be marked “wrong,” whereas errors that belong to the second category can be “graced with wavy or straight underlining and the need for further discussion” (p. 5).

With a similarly product-oriented perspective in mind, Mossop (2014) argues that a translation error refers to those instances in a text that require correction or improvement (binary and non-binary errors, in Pym’s (1992) terms. The required correction or improvement should be in line with the norms of the target culture. Mossop contends that failing to abide by the norms of the target culture results not only in an erroneous translation, but also in what he calls a “non-translation.” For Mossop (1989), abiding by the target culture norms mitigates any subjectivity in error correction and approximates an objective assessment. He clarifies that “approaching the concept of error without at least giving due consideration to the [target culture] norm[s] would constitute a major theoretical oversight” (p. 56).

3.5.3. Translation Errors

TQA is a thorny topic in translation studies and has received growing attention from academic scholars and professionals in the industry (Moorkens et al., 2018). No one denies that assessment is prone to a high degree of relativity and subjectivity (House, 2001), emanating

mainly from the internal biases inherent in the process. The diversity of what can or should be assessed further complicates the matter; as a result, assessment models and methodologies are characterized by degree of high variability. Colina (2009), for instance, clarifies that there is no consensus among scholars on the "what" and "how-to" when it comes to translation assessment. This is obvious in the absence of one main model or framework that is agreed upon among scholarly circles in translation studies.

The multiplicity of TQA models is rooted originally in the variability of definitions of translation (House, 2015). In other words, the different understandings of what translation is and what it entails lead to different conceptualizations of what assessment is, therefore resulting in different models and methodologies. Deciding on which model to choose for assessment is associated with the needs and purposes intended. Williams (2013) argues that it is of paramount importance to determine the purpose for which a model is used: are we using it for diagnostic, summative, or formative purposes? And do we intend to use it for quantitative purposes, as in grading translations, or merely for error analysis purposes so as to analyze translation errors and provide feedback for areas of improvement?

In this study, the purpose of using a TQA model is twofold. First, I intend to use an assessment model that allows for quantitative analysis, through which I can evaluate and measure the performance of the participants in the study in a quantifiable manner. Second, I intend to use a model that allows for in-depth description and classification of translation errors so that I can further explore the nature of student translations. As such, my goal is to use a two-in-one TQA model that supports the two quality indicators simultaneously and, thus, qualifies for both approaches to analysis of translations.

As highlighted earlier, this study seeks to elucidate the relationship between the use of PCBT and translation quality. In order to do so, I need to answer the two proposed research questions: 1) Does the use of PCBT affect the overall number of errors in student translations? and 2) Does the use of PCBT affect the type of errors in student translations? To answer the research questions, an error analysis (EA) approach was adopted. EA opens the door for recognizing the types of errors involved in student translations. James (2013) suggests a four-step approach to analyzing errors, namely: identifying and counting errors, classifying them according to their types, and assessing them. To standardize the process of EA and eliminate any potential subjectivity associated with these steps, I adopted the American Translation Association (henceforth, the ATA) standardized error grading framework.

The ATA framework classifies translation errors into three broad categories: 1) errors related to ***Target Language Mechanics***; 2) errors related to ***Meaning Transfer*** from the ST to the TT; and 3) errors related to the ***Writing Quality*** according to the norms of the target language. It is worth noting that while errors in the first and third categories bear some resemblance, they should not be confused with one another. According to the ATA classification, writing quality errors "are target-language errors that do not clearly violate rules of spelling, grammar, or punctuation [target language mechanics], but detract from the quality of the translation with nonidiomatic, inappropriate, or unclear wording/phrasing" (ATA website, addition mine). Under each broad category of error, there are multiple sub-categories, highlighting specific error types.

The grading framework was adapted in two ways (see Appendix D for the adapted version). First, I excluded some error categories that did not apply to the language pair of this study, such as *diacritical marks/accents (D)*. Second, I also excluded the severity component since the focus was on counting the number and type of errors in this study—which, according to

Llach (2011), is by far "the most common measure of linguistic accuracy" (p. 66)—rather than weighing errors for their seriousness or impact on a translation. In addition, assigning grades based on error severity is a thorny area. On the one hand, it is intuitive to claim that some translation errors may result in more serious outcomes than others. On the other hand, assigning levels of seriousness to these errors is rather subjective and pertains to the raters' idiosyncrasies. Han (2020) explains that the objectivity of such assessment models, of which error weighting is an essential component, is, in fact, "over-hyped" and their practice of rating errors according to their severity is "arbitrary" (p. 260). He even goes further to claim that such a subjective practice is compounded by a lack of empirical evidence linking error severity to translation quality. As Han maintains:

> [a]fter all, the very purpose of conducting TQA is to predict the probability of whether a given translated text could engage, communicate and resonate with human readers. The value of human judgement should be appreciated. With these being said, we are not disparaging the quest for orderliness and consistency in TQA. What we really need is a rule-based, rigorous and transparent assessment mechanism that guards against, by design, undue variability and systematic bias caused by lack of understanding, guidance and compliance (p. 268).

Despite the concerns linked to issues of reliability and validity with regard to quality assessment in the literature (Angelelli, 2009; Eyckmans & Anckaert, 2017), using a TQA model, like the ATA, is an attempt to standardize the assessment process and break away from a scoring model that relies on "subjective impressions" (McAlester, 2000) of the overall quality of translations. Doyle (2003) argues that using a standardized model of assessment not only

associates the academic context with professional practices found in the industry but also provides

> a ready-made, standardized, time-tested, and professionally recognized model for conducting theory-based, systematic, coherent, and consistent evaluations of student translations, [offering] students and instructors with a protocol and common language for translation assessment. This serves to foster a culture of inter-rater reliability wherein we can "be on the same page" when discussing what is right or wrong about a translation (p. 21).

While the ATA framework is originally an industry-based assessment model, a number of researchers have adopted it for pedagogical purposes. Koby and Baer (2005), for instance, explore possible ways of adjusting the framework for translator training programs so that it can be used for assessing student translations. Although the framework is used to assess translations from a product-oriented perspective, they propose multiple methods for adapting the framework for a process-oriented translation class. Koby and Baer also offer detailed mathematical calculations to handle the conversion of marks obtained from the framework to letter grades in compliance with the US university grading system. In a similar vein, Doyle (2003) illustrates the potential of adopting the ATA framework for evaluating student translations in translation programs. He believes that the reliance on such a framework helps translation teachers to move away from the idiosyncrasies of individual, subjective assessments and offers “a sense of stability for the student, who can now understand what to expect from class to class within an academic program, and who knows that his or her course work is linked to a professional context” (p. 29).

Student translation quality is operationalized here from a product-oriented perspective[6] and assessed from bottom-up/top-down approaches, taking into account two main criteria: the number and type of errors in student translations. Although basing translation quality on the number of errors (bottom-up) per translation may seem static and susceptible to validity issues (O'Brien, 2012), involving an in-depth error analytical (top-down) description of error types works as "a remedy to the deficiencies detected in a quantitative quality assessment" (Mateo et al., 2016, p. 1). Nevertheless, notwithstanding the criticism of quantitative assessment, quantifying errors in translation is of considerable significance for two reasons. First, error quantification is a widespread norm found in many TQA models, such as the Canadian Language Quality Measurement System (Sical), the Localization Industry Standards Association (LISA), and the TAUS Dynamic Quality Evaluation Model (see Mateo, 2014, for more details on these models), and is deemed practical since such an approach "fill[s] a gap in the professional TQA arena (…), in which translation becomes a business with constraints of time (…) and budget" (Mateo et al., 2016, p. 2).

Second, quantification and statistics are two main features characterizing any empirical, corpus-based study. Bernardini and Ferraresi (2022) maintain that "quantitative methods lie at the heart of corpus linguistics" and continue to argue that "statistics are also becoming increasingly important when it comes to analysing corpus data" (p. 216). Mellinger and Hanson (2022: 312) hold a similar position, showing that "[m]ost empirical work in TIS belongs [to

[6] We considered TQA from a product-oriented perspective only for the assessment of final translations produced by students. That is, we considered TQA from both a product- and process-oriented perspective during the experiment. In line with process-oriented practices of translation evaluation proposed in the literature on translator education, students had the opportunity to self-monitor their progress by reflecting on their translations and discussing the issues they encountered in the form of written reports. Students also joined peer and group discussions to review some translation issues highlighted in class in an attempt to engage in problem-solving and decision-making processes.

quantification]" since such work usually incorporates quantified data, such as the frequency of occurrence of words, collocations, or certain linguistic patterns, and/or the frequency of certain error types in translations, and so on.

3.6. Study Tools

3.6.1. The Parallel Corpus

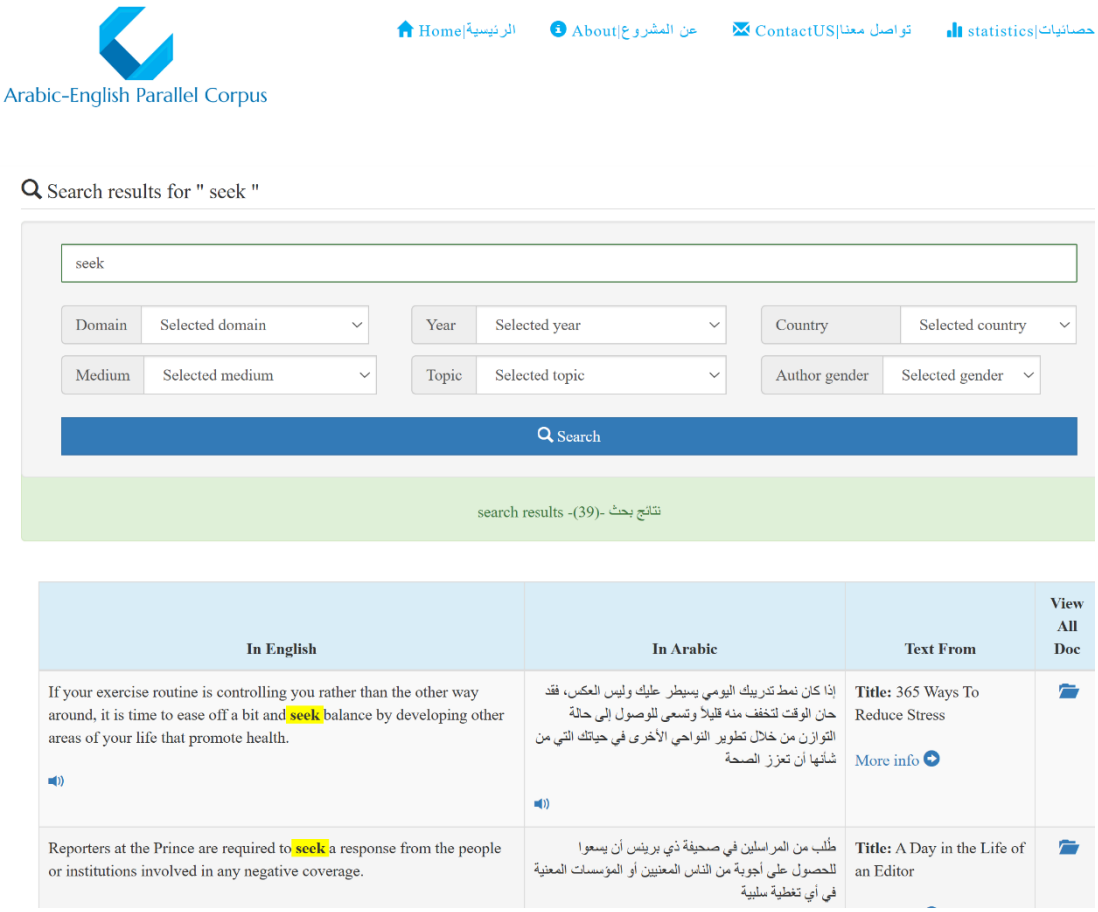
3.6.1.1. Arabic-English Parallel Corpus

For this study, I used a web-based Arabic<>English Parallel Corpus[7], developed by the College of Languages and Translation at King Saud University in Saudi Arabia. The building of the corpus is still in progress and has a target of compiling over 10 million words. The estimates show that the corpus includes over one million words, over 30,000 texts, and more than 180 authors. This data was accurate as of June 10, 2022, a week prior to conducting the experiment. These texts come from various disciplines and have been aligned manually and verified at different stages.

The corpus allows its users to carry out different search queries according to the domain, topic, and country, as well as other factors. It is simple to use, and the queries can be conducted bi-directionally from Arabic into English and vice versa (see Figure 3.1). Users can also view the sources of these texts. Moreover, the corpus makes it feasible for its users to examine the frequency of a word's use across different disciplines. Another feature, which is not yet activated, will allow corpus users to submit queries to obtain certain word collocates. However, one of the limitations of this corpus is that it lacks clear instructions on how to carry out the searches. One should try several times conducting a number of queries until they understand the way search functions work.

[7] http://aeparallelcorpus.com/

Figure 3.1.Parallel concordances for the verb seek in the corpus.



3.6.1.2. Glosbe

In addition to the above corpus, I also used a parallel corpus-based translation dictionary in this study. The dictionary is called *Glosbe*[8] and is open access (Figure 3.2). Just like the parallel corpus above, it is web-based and supports most languages, including Arabic, and can be queried bi-directionally. It also comes in the form of a phone application that works on most smart devices. According to the website statistics, Globse includes over one billion in-context translations, making it the largest online corp`us-based dictionary. The translations come from a

[8] https://glosbe.com/

variety of sources, such as the DGT Translation Memory—which consists of texts from the Acquis Communautaire, the body of European legislation, comprising all the treaties, regulations and laws by the European Union (EU)—news from the OPUS parallel corpora, and open subtitles corpora.

The rationale behind including this corpus-based dictionary is twofold. First, the first corpus, developed by King Saud University (KSU), is rather modest in size and may not be representative of most translation features that need to be accounted for in class. In other words, the recurrent features of translations, depicted in, for instance, the (ir)regularities of the translated language, are limitless, so to speak, where a limited corpus like the first one is most likely insufficient to be comprehensive and thus representative of such features. Therefore, the use of a supportive corpus whereby authentic translated language can be navigated through is a viable solution to make up for any deficiencies experienced in the first corpus.

Second, the incorporation of another corpus is not only essential to address the point of representativeness but also holds considerable academic merit as it is regarded as a form of triangulation in this type of research. The idea of using a combined corpus has gained the attention of several scholars (Pearson, 2003; Zanettin, 2014; Malamatidou, 2018). Although some have not explicitly referred to 'corpus triangulation' in particular, they stressed that a combination of corpora is always advantageous in translator education contexts. This is evident in Pearson's (2003) remarks, for instance, that "parallel corpora and comparable corpora have complementary roles to play in the translator training environment" (pp. 15-16). A similar proposition is also made by Zanettin (2014), who argues "corpus-based translation studies seem to profit most not only from the comparison of different corpus components but also from the

triangulation of data, and the combinations of different components of multilingual corpora" (p. 12).

In the same vein, Malamatidou (2018) has explicitly advocated corpus triangulation and dedicated an entire book in which she proposed a clear methodology to achieve this goal. She notes that in corpus-based translation, corpus triangulation is essential as it paves the way for improving the understanding of translation phenomena by enabling the exploration of a larger repository of authentic texts, allowing students to identify linguistic and translation patterns that would not otherwise be obtained from accessing a single corpus. As she explains:

> [t]ranslation, by its nature, is a complex phenomenon, which is situated between languages and cultures and can be studied from a range of different perspectives, including comparisons between translated and/or non-translated material. For this reason, corpus triangulation can significantly increase our understanding of translation phenomena (pp. 36-37).

For convenience, both the parallel corpus and the corpus-based dictionary are henceforth referred to as the Arabic-English Parallel Corpus (AEPC) throughout the study. The AEPC was used to establish a professional exemplar, documenting translation behavior regardless of any deficiencies or idiosyncrasies in the translation approach adopted. By using this corpus, I do not claim that the corpus provides prescriptive data on what a translation should look like. It was used only to provide a datapoint that teachers can use with novice student translators to teach translation, design exercises, assign homework, and provide corpus-based feedback. Furthermore, it provides students with access to a wide range of translation options, offering them an opportunity to explore more authentic translator behavior.

Figure 3.2.Parallel concordances for sovereignty in Glosbe

The AEPC was used by both the translation instructor and students. For teaching, the APEC provided a datapoint for teaching translation in the experimental group and was used for a range of activities, but mainly for: 1) teaching translation theory; 2) highlighting textual and non-textual features of translated language and non-translated language; 3) designing translation tasks and assignments for scaffolding purposes; and 4) directing students' attention to the typical translation issues and exploring the patterns of translator behaviors to overcome such issues.

Moreover, the use of the AEPC by students in this study serves to bridge the gap left by the lack of technology in translation curriculum, as highlighted in Chapter 1. The initial goal was to include corpus tools that involve Arabic-English parallel corpora, such as SketchEngine. Yet, obtaining a license for all the lab computers would typically be a lengthy process due to tedious bureaucratic procedures. Nevertheless, the current parallel corpus in this study was deemed sufficient for several reasons:

- They provide students with an experience similar to that of using paid software and allow students to gain hands-on experience with some translation tools in order to develop a deeper appreciation of the power and potential of translation technology;
- They are typically available to anyone with an internet connection, whereas paid software often requires a subscription or license. The free-access feature is essential in this context since students need to use these tools outside of the classroom to work on their translation assignments;
- While paid corpora software tends to be more carefully curated and professionally developed than some free-access ones, it does not mean that the latter are of lesser quality. In fact, there are many high-quality, free-access corpora that are funded by some research institutions and are often larger and more up-to-date, such the Corpus of Contemporary American English (COCA), the British National Corpus (BNC), the Reuters corpus, as well as the corpus in this study.

3.7. Data Analysis

The data in this experiment comes from three main sources: the EPE, the translation tests, and the close-ended survey, all of which generated quantitative data. The data were analyzed using the Statistical Package for Social Sciences (SPSS) version 25. First, since the sample here is fewer than 50 participants in each group, i.e. the control and experimental group, I conducted a Shapiro-Wilk test to examine whether the data were normally distributed and whether there were any outliers (George & Mallery, 2010). Because I did not have a pre-test as a baseline due to some limitations (see Section 6.3.), I used the data from the EPE as a safeguarding measure against any potential validity issues caused by variations among students and to ensure equivalence among the pool of participants.

Second, to answer the first and second research questions, I analyzed the translation exams both groups completed and obtained the total number and types of errors per group. I then ran a series of independent Samples *t*-tests (alpha was set to .05) to determine whether any differences between the two groups were significant according to statistical conventions. This was followed by an in-depth examination of students' translations to gain further insights regarding the nature of the errors, their types and what caused them to occur. It is important to note that a correction factor for the multiple comparisons, such Bonferroni, was not applied for two reasons. First, in this study, aspects of translation quality were all pre-defined based on the ATA framework and, thus, all the testing and comparisons on these aspects were pre-planned, consequently not necessitating adjusting the alpha (α) value for correction[9]. Second, each assessed translation aspect was distinct and independent from the other aspects in the framework and received only one statistical test and not multiple tests on the same aspect or construct. As such, applying a correction factor and adjusting the alpha value would be too strict and may result in false negatives, or what is referred to statistically as Type II error.

Finally, a quantitative analysis of the participants' responses in the survey was carried out using descriptive statistics. This analysis was followed by an in-depth discussion of the responses, which helps gain greater insights into the potential applicability of PCBT in other educational contexts. Additionally, it helped uncover not only the participants' general impressions about the overall experience of implementing a PCBT approach in translation

[9] A number of researchers consider applying a correction for multiple comparisons unnecessary (see for example Anderson (2001), Streiner (2015), and Pataki, Metz, and Pakulski, (2014). Saville (1990) recommends not correcting for multiple comparisons but also highlights the need making this clear when interpreting data. Saville suggests treating planned comparisons "as hypothesis generating procedures rather than hypothesis generating and confirming procedures," (p 180.) where the results can be confirmed in subsequent studies.

classes but also their attitudes toward using a parallel corpus and their perceived benefits for translation. The results of the data analysis are discussed in the next chapter.

CHAPTER 4: RESULTS

This chapter provides a detailed presentation of the data, beginning with the results from the EPE exam that was conducted before the experiment. The chapter then offers the results from the translation exams completed by the two groups, followed by analysis of the errors based on the error categories used in the ATA framework. For further insights, the chapter provides analysis of the errors that were unique to the EG group. Finally, the chapter concludes with the presentation and analysis of the survey data.

4.1. Results of the Experiment

4.1.1. Quantitative analysis

In this section, I analyze the data I have collected quantitatively. The quantitative data comes mainly from two tests: the English Proficiency Exam (EPE) and the experimental test, i.e., the translation test. As highlighted in Chapter 3, students in both groups had to retake the department's EPE prior to the start of the experiment. Administering the EPE prior to the experiment was necessary, which serves as a safeguarding measure against any potential validity issues caused by the variations in language proficiency among students in both groups. The results are discussed in the next section.

4.1.1.1. EPE

The EPE consists of four sections: listening, reading, grammar, and vocabulary. The exam is offered in a traditional paper-and-pencil format, with a fixed duration of two hours for completion.

The overall score of the test is 110. Students are assigned to the following levels based on their scores:

Table 4.1. Placement test levels according to the EPE

Level	Scores
Beginner	0 – 30
Intermediate	31 – 50
Upper-intermediate	51 – 70
Advanced	71 – 90
Proficient	91 – 110

Table 4.2 presents students' scores on the EPE in both groups. As seen from the table, most of the scores fell between the intermediate and upper-intermediate levels, with only five students (three in the CG and two in the EG) falling within the advanced level, scoring between 71 and 78. The majority of the students in both groups were at the upper-intermediate level. While both groups displayed similar language competence, I tested the homogeneity of variance using Levene's Test to determine whether the sample was homogeneous or not (Table 4.3). This is important as it helps in determining whether there is a statistically significant variation in the language proficiency among the participants that may affect the interpretation of the results of the experiment. The results showed that Levene's test for equality of variance was found to be non-significant ($F(1.33) = 2.712$, $p = 0.109$), suggesting that the EPE scores between the two groups did not differ significantly.

Table 4.2. EPE scores for the CG and EG

Control Group			**Experimental Group**		
Student	EPE score	EPE level	**Student**	EPE score	EPE level
TR 1 C	55	Upper-Intermediate	**TR 1 E**	60	Upper-Intermediate
TR 2 C	61	Upper-Intermediate	**TR 2 E**	52	Upper-Intermediate
TR 3 C	75	Advanced	**TR 3 E**	49	Intermediate
TR 4 C	63	Upper-Intermediate	**TR 4 E**	50	Upper-Intermediate
TR 5 C	66	Upper-Intermediate	**TR 5 E**	43	Intermediate
TR 6 C	72	Advanced	**TR 6 E**	51	Upper-Intermediate
TR 7 C	49	Intermediate	**TR 7 E**	45	Intermediate
TR 8 C	42	Intermediate	**TR 8 E**	49	Upper-Intermediate
TR 9 C	56	Upper-Intermediate	**TR 9 E**	56	Intermediate
TR 10 C	60	Upper-Intermediate	**TR 10 E**	55	Upper-Intermediate
TR 11 C	35	Intermediate	**TR 11 E**	55	Intermediate
TR 12 C	45	Intermediate	**TR 12 E**	71	Advanced
TR 13 C	58	Upper-Intermediate	**TR 13 E**	53	Upper-Intermediate
TR 14 C	41	Intermediate	**TR 14 E**	40	Intermediate
TR 15 C	78	Advanced	**TR 15 E**	52	Upper-Intermediate
TR 16 C	39	Intermediate	**TR 16 E**	44	Intermediate
TR 17 C	53	Upper-Intermediate	**TR 17 E**	70	Advanced
			TR 18 E	67	Upper-Intermediate
Mean	55.76		**Mean**	53.44	
S.D.	12.809		**S.D.**	8.853	

Table 4.3. Test of homogeneity of variance

		Levene Statistic	**df1**	**df2**	***P***
EPE score	Based on Mean	2.712	1	33	.109

In addition to examining the homogeneity of variance, I examined normality to see whether the data from the EPE were normally distributed. Examining normality not only determines which other statistical tests (parametric vs. non-parametric) to choose for analyzing the data, while also indicating whether the given sample is likely to represent the larger population. To do so, I used a Q-Q "quantile-quantile" plot for the CG (Figure 4.1), another Q-Q plot for the EG (Figure 4.2) and a histogram (Figure 4.3) to graphically check for normality. Both graphs demonstrate that the observed values approximately followed a normal distribution with no strong deviations. Normality was also computed statistically to validate the results from the graphs. For this purpose, I conducted a Shapiro-Wilk test since the sample size was less than 50 participants (Table 4.4). The results of the test indicate that the data from the EPE are normally distributed (W= 0.93, P= 0.54). Furthermore, since the data from the EPE were normally distributed, an independent samples t test was conducted to assess the difference between the two groups. The results showed that the difference between the two groups was found to be non-significant ($t(33) = .626$, $p = 0.535$).

Figure 4.1.Normal Q-Q plot of the EPE scores for the CG.

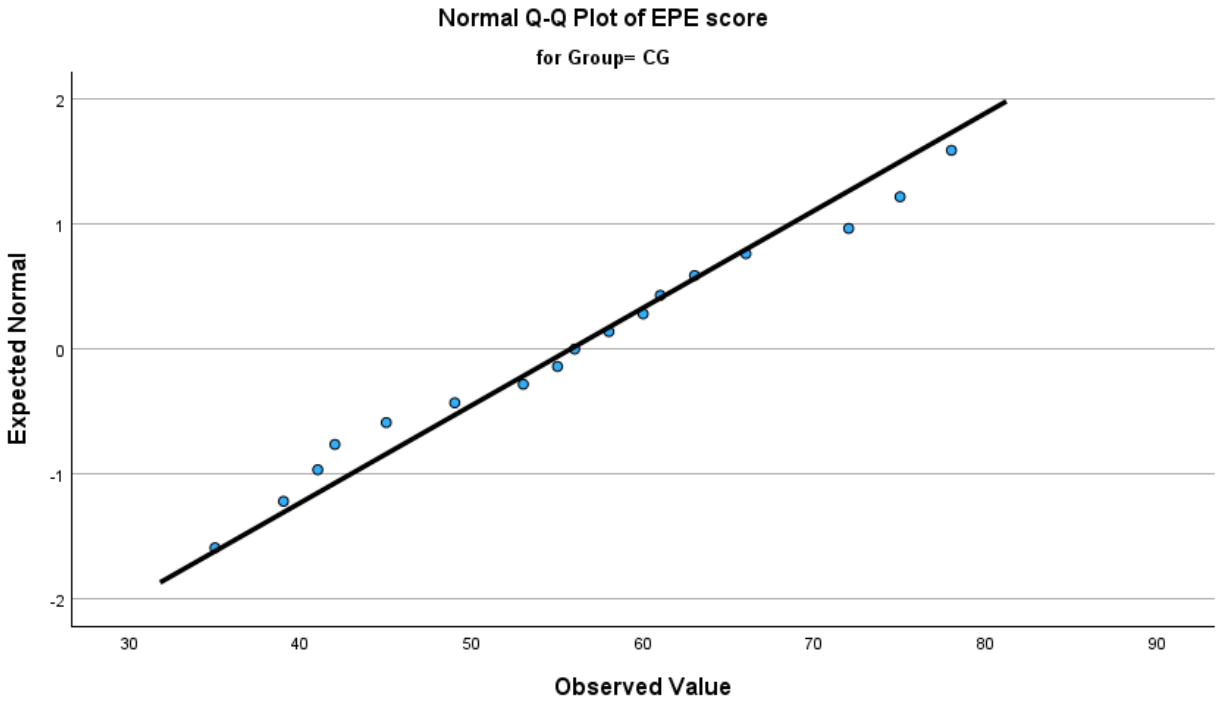


Figure 4.2.Normal Q-Q plot of the EPE scores for EG.

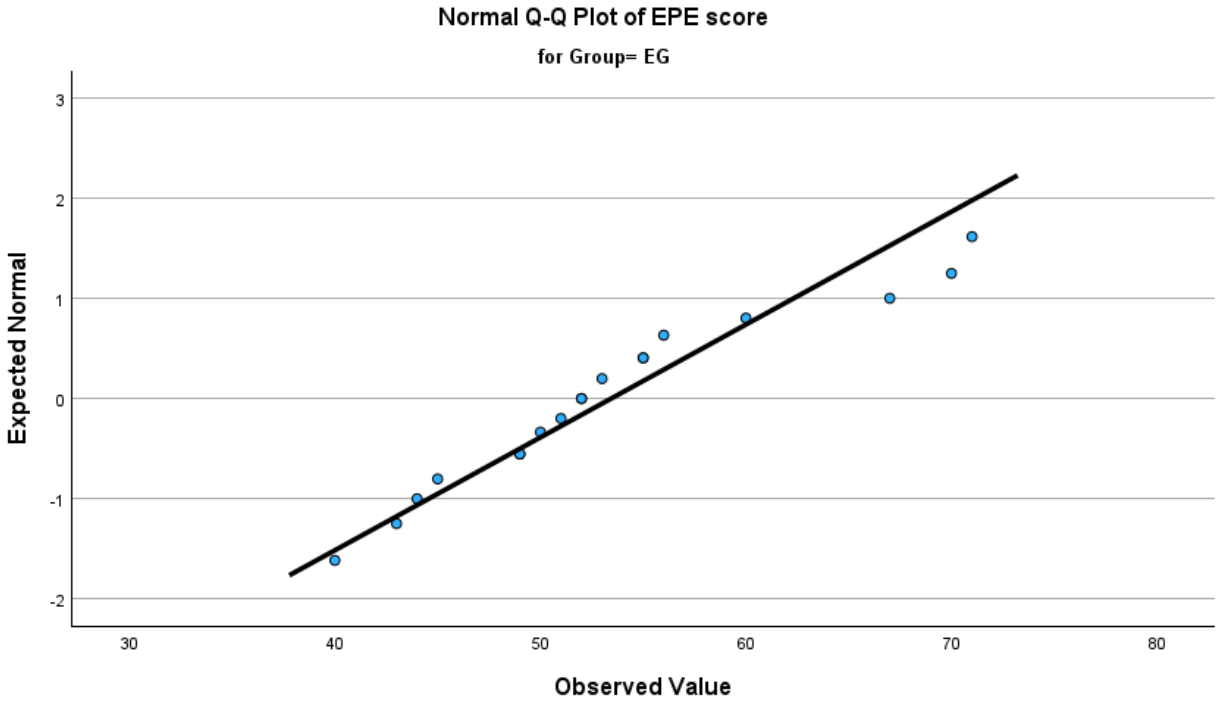


Figure 4.3.Histogram of the EPE score.

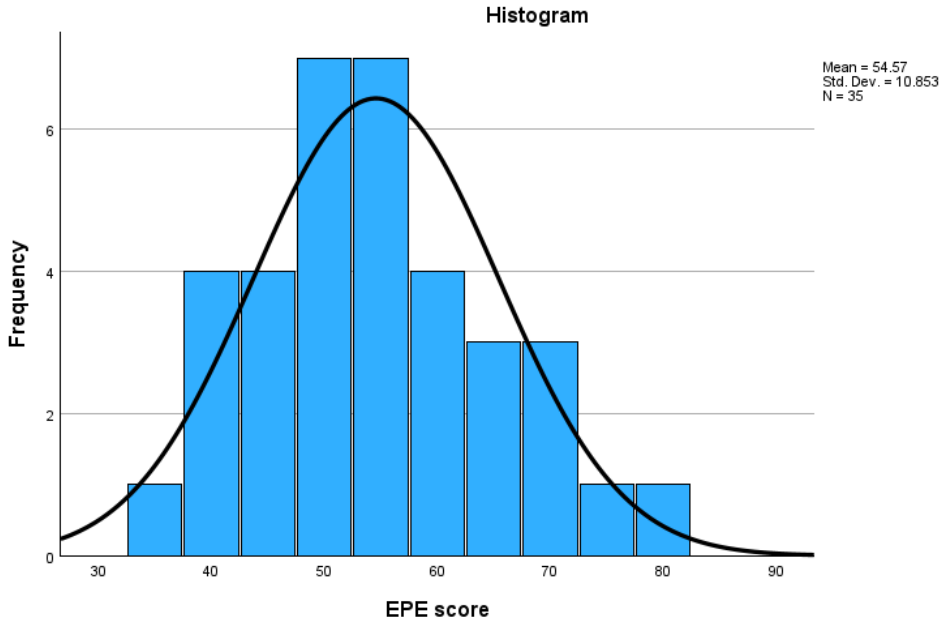


Table 4.4. Statistical test of normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
EPE score	.105	35	.200*	.973	35	.545
*. This is a lower bound of the true significance. a. Lilliefors Significance Correction						

Based on such results from Levene's test, the visual evaluation of normal distribution, and the Shapiro-Wilk test, two conclusions can be made. First, the data from the EPE are normally distributed, a result that is also of paramount significance as it helps in determining the subsequent statistical tests to be used for analyzing data, and (2) the sample is considered homogeneous and has almost equal variances. This last point is significant because it can be concluded that any observed changes in student translation performance subsequent to the experiment cannot be attributed to the disparity in language proficiency levels between the CG and the EG. Furthermore, the results from the EPE substantiate that the two groups have similar

language proficiency and that any changes following the experiment can be ascribed to the intervention used during the experiment.

4.1.1.2. Translation exam

In this section, I seek to quantitatively analyze the data collected from the translation exam, which was completed by the two groups. This exam corresponds to the posttest in the experimental design. That is, students took this test after the experiment was completed, and through analyzing this translation exam, I will obtain results that will allow me to answer the first research question: Does PCBT affect the number of errors in student translations? To do so, I will examine the number of errors in students' translations in both groups, namely the CG and EG. It is worth reminding that students in the CG were not exposed to any form of the treatment and completed a translation task from Arabic into English using traditional resources only, whereas their counterparts in the EG completed the same task using the AEPC. Table 4.5 shows the overall number of errors per participant as well as the means and standard deviation (SD) in each group.

Table 4.5. The total number of translation errors in each group

Groups			
Control Group		**Experimental Group**	
Translator ID	No. of Errors	**Translator ID**	No. of Errors
TR 1 C	22	**TR 1 E**	23
TR 2 C	28	**TR 2 E**	19
TR 3 C	25	**TR 3 E**	16
TR 4 C	24	**TR 4 E**	20
TR 5 C	21	**TR 5 E**	22
TR 6 C	20	**TR 6 E**	15

TR 7 C	23	**TR 7 E**	23
TR 8 C	17	**TR 8 E**	14
TR 9 C	19	**TR 9 E**	15
TR 10 C	21	**TR 10 E**	14
TR 11 C	16	**TR 11 E**	11
TR 12 C	21	**TR 12 E**	16
TR 13 C	25	**TR 13 E**	18
TR 14 C	11	**TR 14 E**	15
TR 15 C	23	**TR 15 E**	17
TR 16 C	17	**TR 16 E**	15
TR 17 C	16	**TR 17 E**	13
		TR 18 E	14
Mean	20.53	**Mean**	16.67
SD	4.200	**SD**	3.481

As highlighted earlier, the raters used a modified version of the ATA framework to score the translations. The total points were calculated following the system described in Koby and Baer (2005)[10], with the exception of using 180-point error as a baseline rather than 160, as followed in Koby (2015). That is, an error-free translation had a total of 180 points, corresponding to 100%. Moreover, since the severity component was excluded, I allocated only one point to be marked off for each error. Table 4.5. illustrates that students in the CG group had a greater number of errors than their counterparts in the EG. I carried out an independent samples

[10] In short, the number of errors is subtracted from 180 points. To arrive at the percentage, the results are then divided by 180 points and multiplied by 100.

t test to examine whether the difference in the number of errors between the two groups is significant. The results are presented in Table 4.6.

Table 4.6. Independent samples *t* test result for the number of errors per group

Group	N	T	df	P	Effect size
Control	17	2.94	33	0.006	0.98
Experimental	18				

As seen in Table 4.5, the participants in the CG ($M = 20.5$, $SD = 4.27$) outnumbered their peers in the EG ($M = 16.7$, $SD = 3.48$) in terms of the number of errors, with the highest number at 28 and 23 for the CG and EG, respectively. According to statistical conventions, the difference in their performance is considered statistically significant ($t(33) = 2.94$, $p = 0.006$). By further examining the results, one can see that not only did the EG have significantly fewer translation errors, but they also had a smaller, or lower, standard deviation (SD=3.48) from that of the CG (SD=4.27). A lower standard deviation suggests lesser variation in errors per participant, indicating that the EG performed rather similarly and consistently in their translations.

While obtaining the p-value is important in determining whether an intervention has an effect and whether the difference between groups is statistically significant, obtaining the effect size[11] is also of paramount importance in the sense that it tells us the magnitude or the size of that effect between the two groups. The effect size is usually sought in research where control and experimental groups are involved, which helps determine whether the impact of an intervention is small or substantial. Cohen (1988) originally defined effect sizes, and Plonsky and Oswald (2014) later re-evaluated them specifically for language research, categorizing effect

[11] The size effect is also referred to as practical significance and is differentiated from statistical significance, obtained through the p-value (Sullivan & Feinn, 2012).

sizes as small (d = 0.4), medium (d = 0.7), and large (d ≥ 1). According to both Cohen (1988) and Plonsky and Oswald (2014), a larger effect size suggests stronger and more practical results. According to the effect size obtained in this study, the effect size between the two groups is computed using Cohen's *d*, yet interpreted according to Plonsky and Oswald's classification. The analysis yields a Cohen's *d* of 0.98, which is considered a relatively large effect.

Now that I have looked at the total number of errors based on student translations in both groups, I shall turn my attention to more specific results, examining errors based on their types. In doing so, I will focus my discussion particularly on the most common errors based on error categories per group with reference to the ATA framework. I will explore whether there is a disparity between the two groups based on error types.

4.1.2. Errors per Error Category

As mentioned previously, I adopted and adapted the ATA framework for the classification and evaluation of errors in student translations. The ATA classifies translation errors into three broad categories: 1) errors related to ***Target Language Mechanics***; 2) errors related to ***Meaning Transfer*** from the ST to the TT; and 3) errors related to the ***Writing Quality*** according to the norms of the target language. In what follows an analysis of errors per error category according to the ATA is presented. In the presentation of errors, I will adhere to the organization of error categories per the adapted ATA framework. Hence, I will start off with a discussion of the errors falling under target language mechanics, meaning transfer, and writing ability. These errors will be reviewed per group. Moreover, I will only discuss in detail the error occasions that represented disparities between the CG and EG, i.e., those that were deemed statistically different. Other errors between the two groups that were not found to be statistically significantly different will only be highlighted.

4.1.2.1. Target language mechanics errors

Target language mechanics consists of three subcategories: grammar (involving both syntax and word form), spelling (involving both character and letter case), and punctuation. Errors under target language mechanics make up the second largest proportion of errors for both groups, the CG and the EG. They represent approximately 37.2% and 43% of the overall number of errors in the CG (n = 349) and the EG (n = 300) respectively (see Table 4.7). Before delving into a detailed discussion of these errors, I would like to make an observation. While students in the CG appeared to have more errors generally than students in the EG in most error subcategories as we will see further in the discussion of errors, students' errors in the EG outnumbered those of their peers in the CG with respect to target language mechanics, in particular. The only exception was the subcategory of spelling, which shows more errors for the CG. Such a result was not expected as I presumed that PCBT would aid students to overcome these errors as it did with most error subcategories. As such, I treated these errors to be unique to the EG and, therefore, allocated a section for discussing them in greater depth (see Section 4.1.3.). As such, this leaves us with spelling errors to discuss for the CG since they significantly differed from those in EG.

Table 4.7. Mean score and SD for target language mechanics errors per group

Target Language Mechanics						
	CG			**EG**		
Error types	**# Errors**	**Mean**	**SD**	**# Errors**	**Mean**	**SD**
Grammar	23	1.35	.786	31	1.72	1.074
Spelling	77	4.53	1.281	53	2.94	1.798
Punctation	30	1.76	.970	45	2.50	.924

a. Spelling

- **Error in the control group (CG)**

This subcategory, including both character and case errors, represents the first most frequent error type under target language mechanics and accounts for well over half (59.2%) of the overall percentage of errors in this category. Of these spelling errors (77 occurrences), a total of 58 belong to character errors and a total of 19 to case errors, respectively. Table 4.8 shows the total number of spelling errors (including case errors) per participant as well as the mean and standard deviation in each group.

Table 4.8. The number of spelling errors per participant in each group

Groups			
Control Group		**Experimental Group**	
Translator ID	No. of Errors	**Translator ID**	No. of Errors
TR 1 C	5	**TR 1 E**	5
TR 2 C	7	**TR 2 E**	3
TR 3 C	2	**TR 3 E**	3
TR 4 C	4	**TR 4 E**	5
TR 5 C	6	**TR 5 E**	7
TR 6 C	5	**TR 6 E**	2
TR 7 C	5	**TR 7 E**	3
TR 8 C	3	**TR 8 E**	2
TR 9 C	4	**TR 9 E**	2
TR 10 C	4	**TR 10 E**	3
TR 11 C	5	**TR 11 E**	1
TR 12 C	3	**TR 12 E**	1
TR 13 C	6	**TR 13 E**	2
TR 14 C	3	**TR 14 E**	2

TR 15 C	5	**TR 15 E**	6
TR 16 C	5	**TR 16 E**	1
TR 17 C	5	**TR 17 E**	4
		TR 18 E	1
Mean Score	4.53	**Mean Score**	2.94
SD	1.28	**SD**	1.79

The analysis shows that students in the CG exhibited nearly 40% ($M = 4.53$, $SD = 1.28$) more spelling errors (both character and capitalization errors) than their counterparts in the EG ($M = 2.94$, $SD = 1.79$), with a total of 77 and 53 counts, respectively. This suggests that students in the EG made, on average, half as many spelling errors as those in the CG. To examine whether the difference was statistically significant, I conducted an independent samples *t* test to determine if the difference in spelling errors is significant (Table 4.9). The analysis reveals that the difference between the two groups is statistically significant ($t(33) = 2.98$, $p = 0.005$).

Table 4.9.Independent samples *t* test result for spelling errors per group

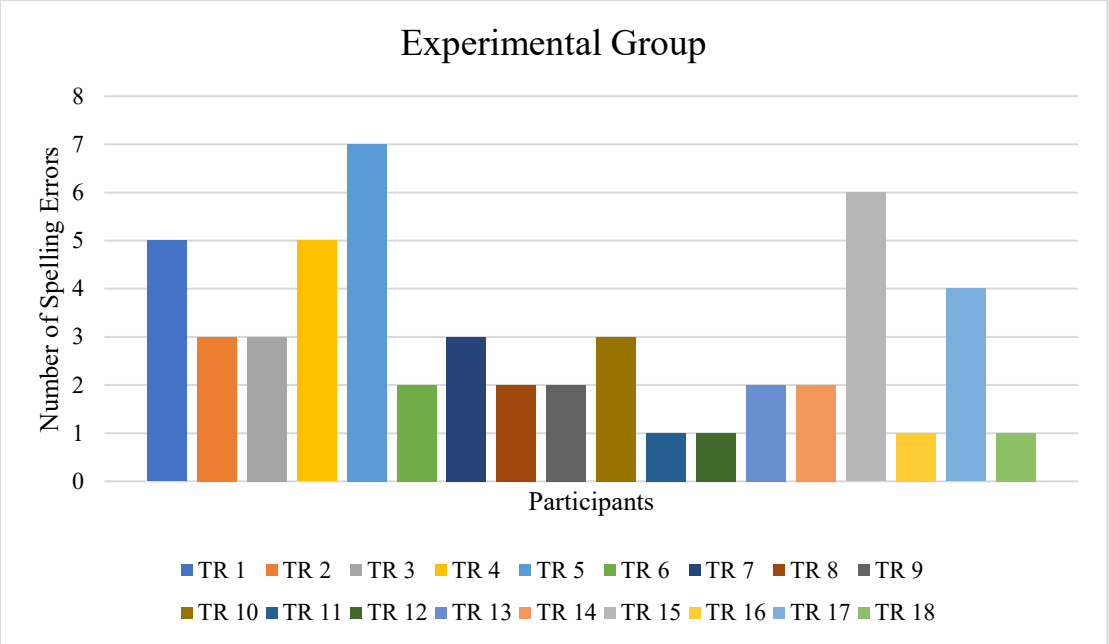
Group	N	T	df	P
Control	17	2.98	33	0.005
Experimental	18			

- **Error in the experimental group (EG)**

Like the CG, spelling errors represent the first most frequent error type under target language mechanics in the EG, representing approximately 41% of all overall errors in this category (n = 129). Of all spelling errors, 41 occurrences were character errors, while 12 occurrences were capitalization errors. However, while the analysis shows that spelling errors

were the most common error type in the two groups, students in the EG exhibited a notable decrease in spelling error counts in comparison to their peers in the CG. The difference in spelling error rate between the two groups was approximately 31.16%, suggesting that students in the EG had shown greater accuracy in their spelling knowledge. This outcome further highlights the effectiveness of PCBT in reducing errors related to character and capitalization inconsistencies. Figure 4.4. illustrates the total number of spelling errors in the EG per participant.

Figure 4.4.Participants' spelling errors in the EG



While the difference between the two groups was statistically significant as seen above, I computed the effect size in order to determine practical significance of this difference. Table 4.10 shows that the effect size is considered large (d= 1.01) according to statistical conventions. Such a result indicates that the intervention had a major impact on students' spelling, suggesting that the use of the AEPC was not only significantly different but also practically effective in improving student performance in terms of spelling accuracy.

Table 4.10. Independent samples effect sizes for spelling

		Standardizer[a]	Point Estimate	95% Confidence Interval	
				Lower	Upper
Spelling	Cohen's d	1.568	1.011	.298	1.710

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.

4.1.2.2. Meaning transfer errors

The ATA framework divides meaning transfer errors into the following subcategories: unfinished passage, addition, ambiguity, cohesion, faithfulness, literalness, misunderstand of the ST, omission, terminology, verb tense, and indecision. Meaning transfer errors make up the largest proportion of errors for both the CG and the EG (Table 4.11), compared to errors under target language mechanics and writing ability. They account for roughly 53.6% and 50.3% of the overall number of errors in the CG (n = 349) and the EG (n = 300), respectively. In this section, I will shed light on the nature of the errors made by students in the two groups. However, I will first make a number of observations worthy of discussion before delving into the analysis. First, none of the participants in either group translated the text partially. They all completed the translation, rendering the source text in its entirety. Therefore, the subcategory of *unfinished passage* received zero error points in both groups. Second, students in the CG were found to have more errors than the EG in the following subcategories of meaning transfer: cohesion, literalness, misunderstanding of the ST, omission, terminology, verb form, and indecision, accounting for 11.7%, 15.5%, 4.2%, 16%, 34.2%, 5.8%, and 2.1% of all errors under meaning transfer (n= 187), respectively. A significant difference, according to statistical conventions, is observed between the CG and the EG group with respect to these three subcategories only: terminology/word choice ($t(33) = 3.77$, $p = <0.001$), omission ($t(33) = 2.17$, $p = 0.037$), and literalness ($t(33) = 2.27$, $p = 0.030$). On the other hand, The difference between the two groups is

considered statistically non-significant in regard to the other subcategories: cohesion ($t(33) = 0.819$, $p = 0.419$), verb form ($t(33) = 1.50$, $p = 0.413$), misunderstanding of the ST ($t(33) = 1.38$, $p = 0.177$), and indecision (t(33) = 494, p = 0.624). Third, the EG appeared to have more errors than the CG in the following subcategories under meaning transfer: addition, faithfulness, and ambiguity, which will be discussed in further detail in Section 4.1.3.

Table 4.11. Number of meaning transfer errors per group

Meaning Transfer Errors						
	CG			EG		
Error types	**#Errors**	**Mean**	**SD**	**# Errors**	**Mean**	**SD**
Unfinished passage	0	.00	.000	0	.00	.000
Addition	13	.76	.752	36	2.00	1.237
Ambiguity	1	.06	.243	5	.28	.461
Cohesion	22	1.29	.772	19	1.06	.938
Faithfulness (translation strays too far from ST meaning)	5	.29	.588	10	.56	.705
Literalness	29	1.71	1.105	17	.94	.873
Misunderstanding of the ST	8	.47	.624	4	.22	.428
Omission	30	1.76	1.393	16	.89	.963
Terminology	64	3.76	1.437	36	2.00	1.328
Verb form	11	.65	.931	5	.28	.461
Indecision	4	.24	.437	3	.17	.383
Total Errors	187			151		

a. Terminology/word choice

- **Errors in the control group (CG)**

This subcategory of errors accounts for the first most frequent error type under meaning transfer errors and represents 34.2% of errors that belong to this category. Such errors resulted from an erroneous selection of a target term or word in relation to its corresponding ST one. I

found that the CG's terminology/word choice errors (n= 64) are greater than those made by the EG (n= 36). Table 4.12 shows the number of terminology/word choice errors per participant as well as the mean and standard deviation in each group.

Table 4.12. The number of terminology/word choice errors per group

Groups			
Control Group		**Experimental Group**	
Translator ID	No. of Errors	**Translator ID**	No. of Errors
TR 1	3	**TR 1**	2
TR 2	5	**TR 2**	4
TR 3	6	**TR 3**	2
TR 4	4	**TR 4**	1
TR 5	3	**TR 5**	4
TR 6	5	**TR 6**	3
TR 7	3	**TR 7**	2
TR 8	2	**TR 8**	1
TR 9	4	**TR 9**	0
TR 10	6	**TR 10**	2
TR 11	4	**TR 11**	3
TR 12	3	**TR 12**	2
TR 13	5	**TR 13**	1
TR 14	1	**TR 14**	0
TR 15	5	**TR 15**	3
TR 16	2	**TR 16**	2
TR 17	3	**TR 17**	0
		TR 18	4

Mean Score	3.76	**Mean Score**	2.00
SD	1.44	**SD**	1.33

I carried out an independent samples *t* test to determine whether the difference in errors between the two groups was significant. As seen in Table 4.13, the difference between the two groups can be considered statistically significant ($t(33) = 3.77$, $p < 0.001$). On average, students in the CG (M=3.76, SD=1.44) had nearly twice the number of terminology/word choice errors compared to those in the EG (M=2.00, SD=1.33).

Table 4.13. Independent samples *t* test for terminology/word choice errors per group

Group	N	T	df	P
Control	17	3.77	33	< 0.001
Experimental	18			

- **Errors in the experimental group (EG)**

Like the CG, terminology/word choice errors constitute the most frequent error type under meaning transfer in the EG, accounting for nearly 23.8% of all errors in this category. However, students in the EG demonstrated a substantial decrease in errors of this type, making 43.75% fewer terminology and word choice errors compared to their peers in the CG. In other words, the EG specifically had 36 such errors (M=2.00, SD= 1.33), illustrating clear improvement in their lexical accuracy compared to the CG. As noted in the previous analysis, this difference was found to be statistically significant, suggesting that the intervention used by the EG could have played a role in improving students' ability to have higher precision in using the correct terminology and word choices

The size of the effect was also calculated to determine the magnitude of the effect of the AEPC intervention. Table 4.14 shows that Cohen's effect size (*d*=1.38) is considered large based on statistical benchmarks. Such a result indicates that translating with the assistance of the AEPC was deemed effective and helped students in the EG overcome linguistic deficiencies pertaining to terminology/word choice knowledge.

Table 4.14. Independent samples effect sizes for terminology

		Standardizer[a]	Point Estimate	95% Confidence Interval	
				Lower	Upper
Terminology	Cohen's d	1.382	1.277	.538	1.999
a. The denominator used in estimating the effect sizes. Cohen's d uses the pooled standard deviation.					

b. Omission

- **Errors in the control group (CG)**

Omissions represent the second most frequent error type under meaning transfer. They account for approximately 16% of all errors under meaning transfer. Such errors resulted from leaving out meaningful parts from the ST untranslated. The results show that the omission errors in the CG almost doubled (n=30) from those made by their counterparts in the EG (n=16). Table 4.15 illustrates the number of omission errors per participant in the CG and the EG.

Table 4.15. Participants' omission errors per group

Groups			
Control Group		**Experimental Group**	
Translator ID	No. of Errors	**Translator ID**	No. of Errors
TR 1	2	**TR 1**	3
TR 2	1	**TR 2**	0
TR 3	3	**TR 3**	0

TR 4	4	**TR 4**	0
TR 5	1	**TR 5**	1
TR 6	1	**TR 6**	3
TR 7	1	**TR 7**	1
TR 8	3	**TR 8**	1
TR 9	1	**TR 9**	0
TR 10	0	**TR 10**	0
TR 11	0	**TR 11**	1
TR 12	2	**TR 12**	1
TR 13	2	**TR 13**	1
TR 14	4	**TR 14**	2
TR 15	4	**TR 15**	0
TR 16	0	**TR 16**	1
TR 17	1	**TR 17**	1
		TR 18	0
Mean Score	1.76	**Mean Score**	0.89
SD	1.39	**SD**	0.96

I conducted an independent samples *t* test to determine whether the difference in errors between the two groups is significant. As can be seen from Table 4.16, the mean difference between the CG (*M*=1.76, *SD*=1.39) and the EG (*M*=0.89, *SD*=0.96) is considered statistically significant at the level of 95% confidence level ($t(28.2) = 2.15$, $p = 0.040$).

Table 4.16. Independent samples *t* test result for omission errors per group

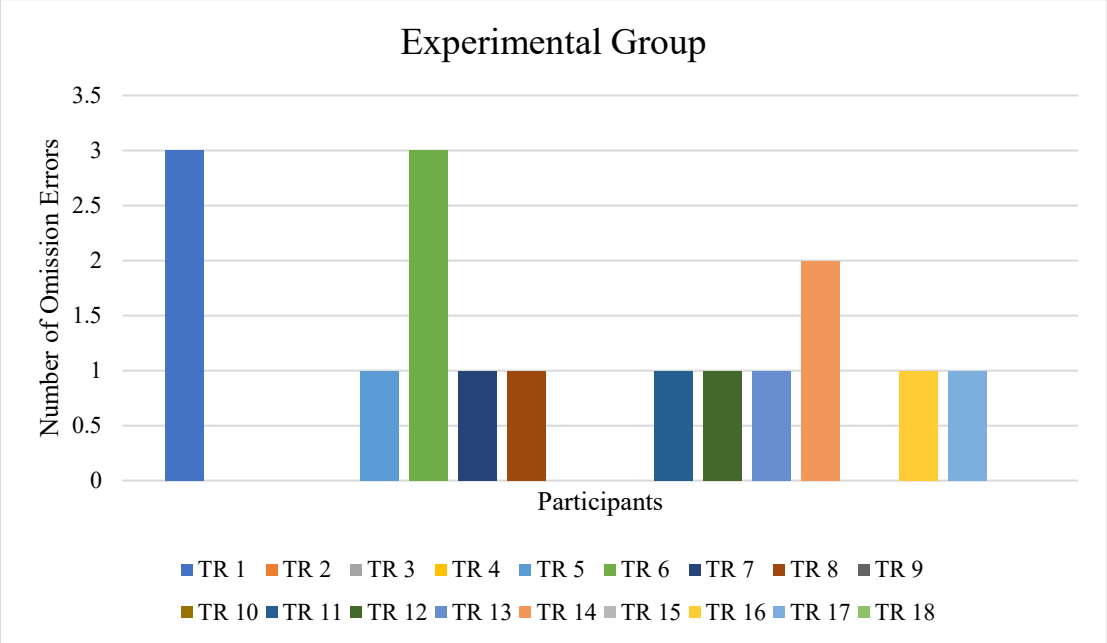
Group	N	T	df	P

Control	17	2.17	33	0.040
Experimental	18			

- **Errors in the experimental group (EG)**

While omission errors in the CG were represented as the second most prevalent error type under meaning transfer, they came in as the fourth most frequent error type in the EG. Omission errors accounted for 10.5% of all errors under meaning transfer. However, although students in the EG did have some omission errors in their translations, these occurrences of omissions were fewer than those made by their peers in the CG (see Figure 4.5).

Figure 4.5. Participants' omission errors in the EG



Although the above results suggested that the difference between the two groups in terms of omission errors was statistically significant, I was also interested in examining the effect size between the CG and EG to determine the practical significance of the intervention. Table 4.17 illustrates the size of the effect (d=.73) is considered relatively moderate to large. Again, this

result suggests that the APEC as an intervention is considered effective helping students in the EG exhibit a greater ability to retain meaning in their translations and reduce errors resulting from unattended omissions.

Table 4.17. Independent samples effect sizes for terminology

		Standardizer[a]	Point Estimate	95% Confidence Interval	
				Lower	Upper
Omission	Cohen's d	1.191	.735	.044	1.416
a. The denominator used in estimating the effect sizes. Cohen's d uses the pooled standard deviation.					

c. Literalness

- **Errors in the control group (CG)**

Literalness errors constitute the third most frequent error type under meaning transfer in the CG and account for 15.5% of errors under this category. These errors resulted from translating the ST word(s) literally, creating an unclear meaning in the TT. I found that students in the CG had higher literalness error counts (n=29) than their counterparts in the EG (n=17). Table 4.18 shows the number of literalness errors per participant in the CG and the EG .

Table 4.18. Participants' literalness errors per group

Groups			
Control Group		**Experimental Group**	
Translator ID	No. of Errors	**Translator ID**	No. of Errors
TR 1	3	**TR 1**	1
TR 2	2	**TR 2**	2
TR 3	3	**TR 3**	1
TR 4	1	**TR 4**	1
TR 5	3	**TR 5**	2

TR 6	2	**TR 6**	0
TR 7	3	**TR 7**	0
TR 8	2	**TR 8**	0
TR 9	1	**TR 9**	0
TR 10	1	**TR 10**	0
TR 11	0	**TR 11**	0
TR 12	2	**TR 12**	2
TR 13	3	**TR 13**	2
TR 14	0	**TR 14**	2
TR 15	0	**TR 15**	1
TR 16	2	**TR 16**	1
TR 17	1	**TR 17**	0
		TR 18	2
Mean Score	1.71	**Mean Score**	0.94
SD	1.10	**SD**	0.87

I carried out an independent samples *t* test to examine if the difference in errors between the two groups is significant. From Table 4.19, we can see that the mean difference between the CG (*M*=1.71, *SD*=1.10) and the EG (*M*=0.94, *SD*=0.87) is considered statistically significant at the level of 95% confidence level ($t(33) = 2.17$, $p = 0.030$).

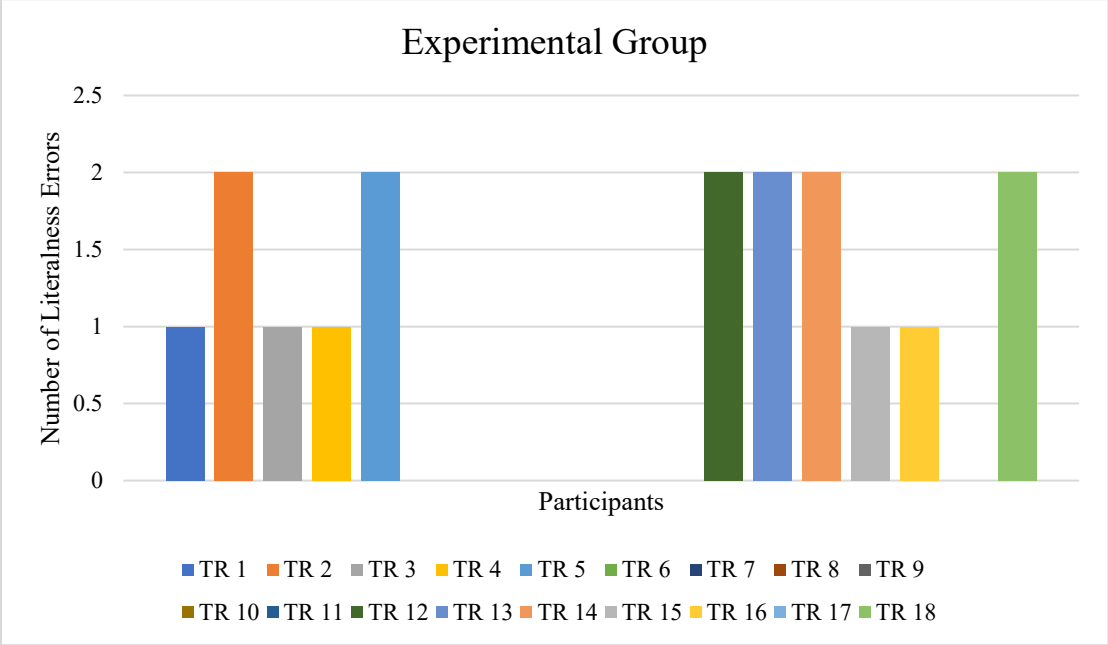
Table 4.19. Independent samples *t* test result for literalness errors per group

Group	N	T	df	P
Control	17	2.27	33	0.030
Experimental	18			

- **Errors in the experimental group (EG)**

Literalness errors also appear to take place in the translations of the EG. They represent the third most frequent error subcategory under meaning transfer. These errors account for 11.2% of the total number of errors under meaning transfer. However, while students in the EG did have literalness errors, they were fewer than those exhibited by their peers in the CG (see Figure 4.6).

Figure 4.6. Participants' literalness errors in the EG



To examine the practical significance of the intervention, I computed the effect size of the independent samples *t* test. Table indicates that the effect size (*d*=.78) is considered relatively large, suggesting significant improvement in the EG realized by the reduced total number of literalness errors as a result of the AEPC intervention.

Table 4.20. Independent samples effect sizes for literalness

		Standardizer[a]	Point Estimate	95% Confidence Interval	
				Lower	Upper
Literalness	Cohen's d	.992	.768	.074	1.450

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.

4.1.2.1. Writing ability errors

The category of writing ability consists of the following subcategories: usage, register, and style. Errors resulting from writing ability represent the least proportion of errors in both groups, compared to errors that belong to target language mechanics and meaning transfer. Such errors represent about 9.1% and 6.7% of the overall number of errors for the CG (n=349) and the EG (n=300), respectively (Table 4.21). It is worth noting that while the EG appeared to make fewer writing ability errors, there was no statistically significant difference between the CG and EG on the three subcategories of writing ability errors: usage ($t(33)= 1.88$, $p=0.068$), register ($t(33)= 1.06$, $p=0.294$), and style ($t(16)=1.000$, $p=0.332$).

Table 4.21. Number of writing ability errors per group

Writing Ability Errors						
	CG			**EG**		
Error types	**# Errors**	**Mean**	**SD**	**# Errors**	**Mean**	**SD**
Usage	13	.76	.752	6	.33	.594
Register	18	1.06	.827	14	.78	.732
Style	1	.06	.243	0	.00	.000

It is important to highlight that although the descriptive statistics showed statistically non-significant differences in the mean scores between the two groups on the three subcategories, the effect size of the intervention is considered moderate ($d = .639$) for usage errors and a little above small ($d = .361$) for register errors (see Tables 4.22 and 4.23, respectively). Such a result suggests that there is potential for improvement in performance in the EG in regard to these types of error, but it may not be substantially large enough to assert that the intervention had a major impact on effectively reducing the number of errors. This was also the case for style errors (Table 4.24), which had a small effect size of d .348.

Table 4.22. Independent samples effect sizes for usage

		Standardizer[a]	Point Estimate	95% Confidence Interval	
				Lower	Upper
Usage	Cohen's d	.676	.639	-.046	1.314

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.

Table 4.23. Independent samples effect sizes for register

		Standardizer[a]	Point Estimate	95% Confidence Interval	
				Lower	Upper
Register	Cohen's d	.780	.361	-.311	1.026

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.

Table 4.24. Independent samples effect sizes for style

		Standardizer[a]	Point Estimate	95% Confidence Interval	
				Lower	Upper
Style	Cohen's d	.169	.348	-.322	1.014

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.

4.1.3. Errors Unique to the Experimental Group (EG)

In the previous section, I reviewed the common errors in student translations in the CG. I treated such errors as a baseline against which I compared and evaluated the performance of the students in the EG who received PCBT. I found that most students in the EG managed to overcome these errors and exhibited a statistically significant difference compared to their peers in the CG who were given traditional resources. Now, I will turn the discussion to the type of errors I found unique to the EG, in the sense that they were found to be repeatedly occurring among students in the EG, but not as often in the CG. Only errors that were found to statistically differ from the CG will be reviewed in detail. The others will be reviewed briefly.

The analysis shows that the EG has more errors in the following five subcategories: grammar and punctuation (under target language mechanics) and addition, faithfulness, and ambiguity (under meaning transfer). Grammar and punctuation represent roughly 24% and 34.9 % of the errors under target language mechanics respectively, and addition, faithfulness, and ambiguity account for 23.8%, 6.5%, and 3.3% of the errors under meaning transfer. Of these error subcategories, only errors that resulted from addition (meaning transfer errors) and incorrect punctuation (target language mechanics errors) are statistically significant in comparison to the CG. Errors that belong to the subcategory of *grammar* (involving both syntax and word form) were not considered statistically significant ($t(33) = -1.15$, $p = 0.25$). The same applies to errors that belong to faithfulness ($t(33) = -1.18$, $p = 0.243$) and ambiguity ($t(33) = -1.74$, $p = 0.091$), which were found to be statistically non-significant in comparison to the CG. I will now review errors that belong to addition and punctuation due to their statistically significant differences between the two groups.

4.1.3.1. Addition errors

As highlighted earlier, students' erroneous addition errors in the EG (n=36) were higher than those made by their peers in the CG (n=13). I conducted an independent samples *t* test to examine if the difference in errors between the two groups is significant (Table 4.25). The analysis reveals that the mean difference between the EG (M=2.00, SD=1.24) and the CG (M=0.76, SD=0.75) is considered statistically significant ($t(33) = -3.54$, $p = 0.001$). For addition errors per participant in the CG and EG, see Table 4.26.

Table 4.25. Independent samples *t* test result for addition errors per group

Group	N	T	df	P
Control	17	-3.54	33	0.001
Experimental	18			

Table 4.26. Participants' addition errors per group

Groups			
Control Group		**Experimental Group**	
Translator ID	No. of Errors	**Translator ID**	No. of Errors
TR 1	0	**TR 1**	2
TR 2	2	**TR 2**	3
TR 3	1	**TR 3**	3
TR 4	0	**TR 4**	3
TR 5	1	**TR 5**	3
TR 6	0	**TR 6**	2
TR 7	2	**TR 7**	4
TR 8	0	**TR 8**	1
TR 9	1	**TR 9**	3
TR 10	1	**TR 10**	3
TR 11	0	**TR 11**	2
TR 12	2	**TR 12**	3
TR 13	0	**TR 13**	1
TR 14	1	**TR 14**	0
TR 15	0	**TR 15**	2
TR 16	1	**TR 16**	1

TR 17	1	**TR 17**	0
		TR 18	0
Mean Score	0.76	**Mean Score**	2.00
SD	0.75	**SD**	1.24

4.1.3.2. Punctuation errors

Like addition errors, punctuation errors were determined to be higher in the EG than the CG (Table 4.27). They represented the second most frequent error type for the EG under target language mechanics, representing 34.9% of the overall number of errors under this category. Since students in the EG had more punctuation errors than students in the CG (30 and 45 counts, respectively), I conducted an independent samples *t* test to examine if the difference between the two groups is significant. The result indicates that the mean difference between the EG (M=2.5, SD=0.92) and the CG (M=1.76, SD=0.97) is considered statistically significant ($t(33) = -2.29$, $p = 0.028$). Table 4.28 shows the independent samples *t* test's result.

Table 4.27. Participants' addition errors per group

Groups			
Control Group		**Experimental Group**	
Translator ID	No. of Errors	**Translator ID**	No. of Errors
TR 1	3	**TR 1**	2
TR 2	2	**TR 2**	1
TR 3	3	**TR 3**	3
TR 4	1	**TR 4**	3
TR 5	2	**TR 5**	2
TR 6	3	**TR 6**	2

TR 7	2	**TR 7**	4
TR 8	2	**TR 8**	2
TR 9	1	**TR 9**	3
TR 10	2	**TR 10**	2
TR 11	0	**TR 11**	2
TR 12	2	**TR 12**	1
TR 13	2	**TR 13**	3
TR 14	0	**TR 14**	4
TR 15	3	**TR 15**	2
TR 16	1	**TR 16**	3
TR 17	1	**TR 17**	4
		TR 18	2
Mean Score	1.76	**Mean Score**	2.5
SD	0.97	**SD**	0.92

Table 4.28. Independent samples *t* test result for punctuation errors per group

Group	N	T	df	P
Control	17	-2.29	33	0.028
Experimental	18			

4.2. Survey Evaluation

As mentioned in Chapter 3, I used a close-ended survey to examine the participants' attitudes toward the implementation of the AEPC as a main translation and teaching resource. The survey was administered after students completed the final exam. It was adapted from Liu (2020) and addressed three main themes: 1) students' experience of the parallel corpus, the

AEPC; 2) their attitudes toward using the AEPC; and 3) their approach to using the AEPC as a tool to solve translation problems. Using a Likert scale from 1 to 5, students responded to a total of 10 questions. A Cronbach's alpha of (α= 0.891) was reported, which suggests a high-level support of internal validity. In the analysis of the results, I am grouping together the agreement component (strongly agree and agree) and the disagreement component (strongly disagree and disagree) for simplicity and ease of data presentation. For analyzing the Likert scales responses, descriptive statistics were used.

4.2.1. Students' overall experience of the parallel corpus

The first statement pertains to students' viewpoints on the effectiveness of the AEPC, assessing its general capacity as a translation aid. The second statement addresses the usability of the AEPC. Finally, the last statement explores the ability of the AEPC to offer practical solutions for translation problems students encountered while translating. Figure 4.7 illustrates their agreement with each statement. Table 4.29 illustrates the percentages together with the mean scores and standard deviations for each item.

Figure 4.7. Responses to the first section of the survey

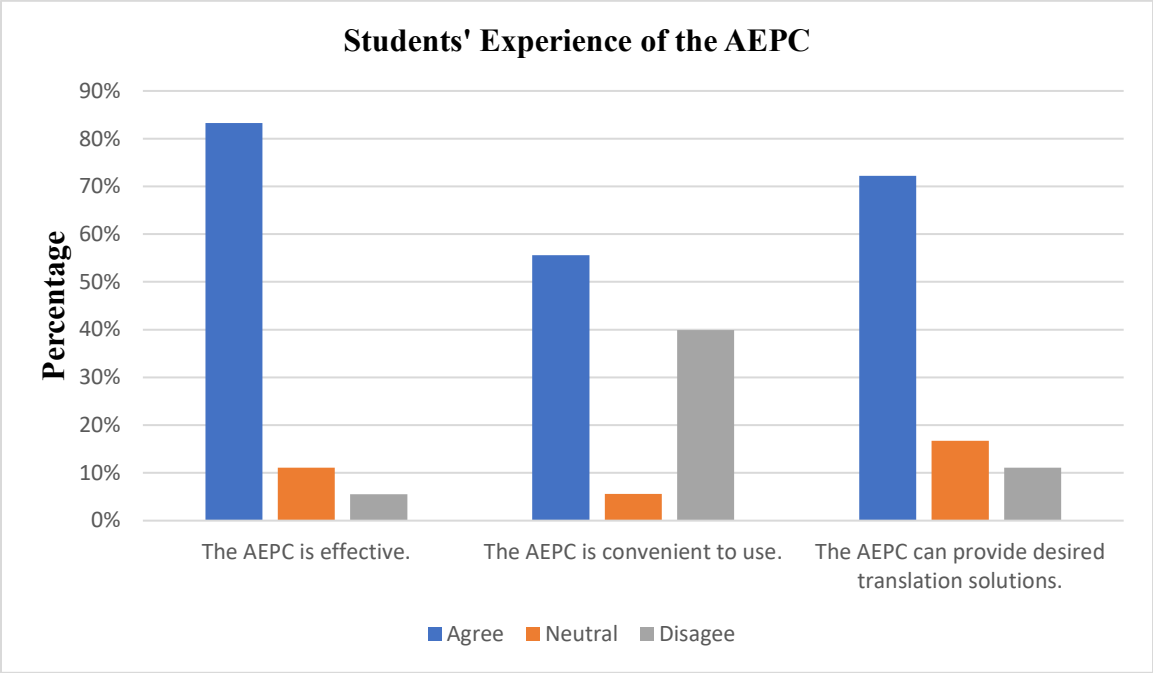


Table 4.29. Descriptive statistics for the first section of the survey

Evaluation of the AEPC	Agree	Neutral	Disagree
The AEPC is effective.	15 (83.3%)	2 (11.1%)	1 (5.5%)
The AEPC is convenient to use.	10 (55.6%)	1 (5.6%)	7 (39.9%)
The AEPC can provide the desired translation solutions.	13 (72.2%)	3 (16.7%)	2 (11.1%)

Results from the survey show that the first statement is the one with the highest agreement (83.3%), while the second statement has the lowest agreement (55.6%). As seen in Figure 4.7, the responses suggest that about 83% of the respondents found the AEPC effective to use, 11.1% remained neutral, whereas only 5.5% found otherwise. Similarly, while more than half (55%) of the respondents found the AEPC convenient to use, about 40% found it less convenient. On the third statement, roughly 72% agreed that the AEPC is a viable aid for offering translation solutions, about 16% remained neutral, and 11% reported disagreement.

4.2.2. Students' attitudes toward the parallel corpus

The second component of the survey involves assessing the respondents' attitudes toward the AEPC. The first statement examines whether the integration of the parallel corpus contributes to enhanced confidence during translation. The second statement pertains to evaluating whether translating with the assistance of the AEPC leads to enhanced translation interest. The third statement measures the sense of professionalism when using the AEPC. Figure 4.8 gives an overview of the respondents' answers to this section. Table 4.30 illustrates the percentages together with the mean scores and standard deviations for each item.

Figure 4.8. Responses to the second section of the survey

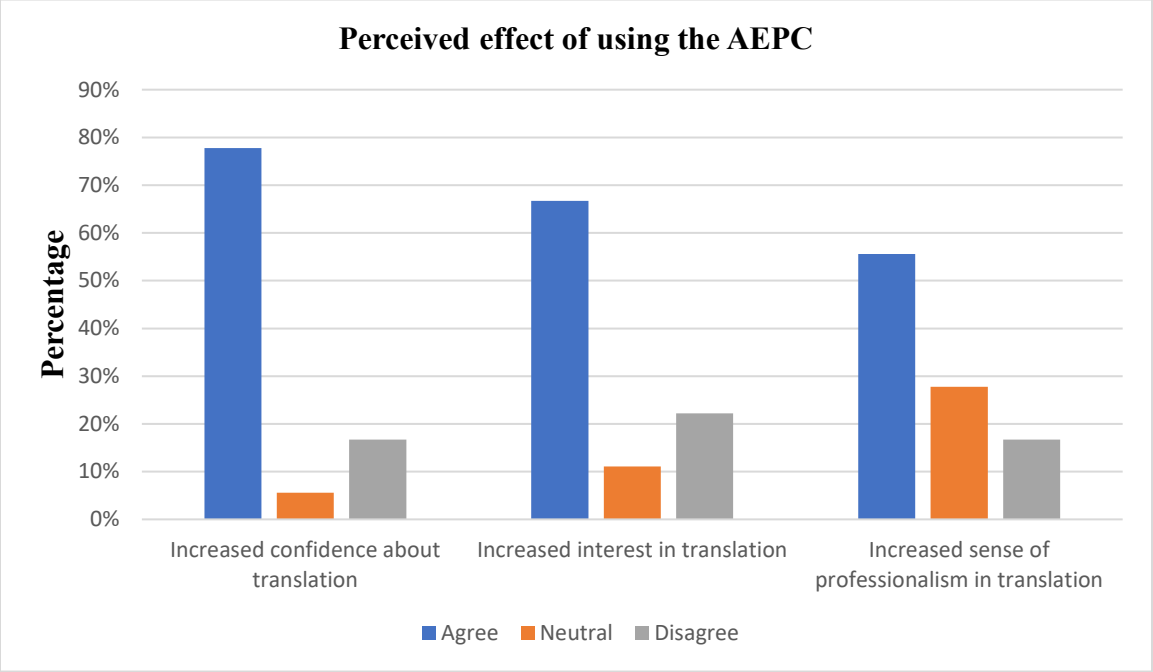


Table 4.30. Descriptive statistics for the second section of the survey

Perceived effect of using the AEPC.	Agree	Neutral	Disagree
Increased confidence about translation	14 (77.8%)	1 (5.6%)	3 (16.7%)
Increased interest in translation	12 (66.7%)	2 (11.1%)	4 (22.2%)
Increased sense of professionalism in translation	11 (55.6%)	5 (27.8%)	3 (16.7%)

As in the first component of the survey, participants held a generally positive attitude toward using the AEPC. The highest frequency rate belongs to the second statement (66.7%), whereas the lowest one belongs to the third statement (55.6%). As seen in Figure 4.8, almost 78% of the respondents reported increased confidence in translation when using the parallel corpus. Those who had a contrasting viewpoint represented about 16% and only 5.6% had a neutral viewpoint. For increased interest in translation, around 67% of the respondents agreed with statement, about 22% expressed otherwise, and 11.1% held a neutral position. Finally, regarding the last statement, more than half of the respondents (55.6%) reported an enhanced sense of professionalism when translating with the assistance of the AEPC, whereas 16.7% suggested otherwise.

4.2.3. Students' approach toward using the parallel corpus

The third section of the survey is directed at eliciting students' responses regarding their approach to using the parallel corpus in their translation. The first, second, and third statements assess the AEPC's capacity to help students solve translation problems at the word, phrase, and sentence levels, respectively. The fourth statement examines whether the AEPC was of any help to improving the respondents' knowledge of English grammar. Figure 4.9 gives an overview of the respondents' answers to this section. Table 4.31 illustrates the percentages together with the mean scores and standard deviations for each item.

Figure 4.9. Responses to the third section of the survey

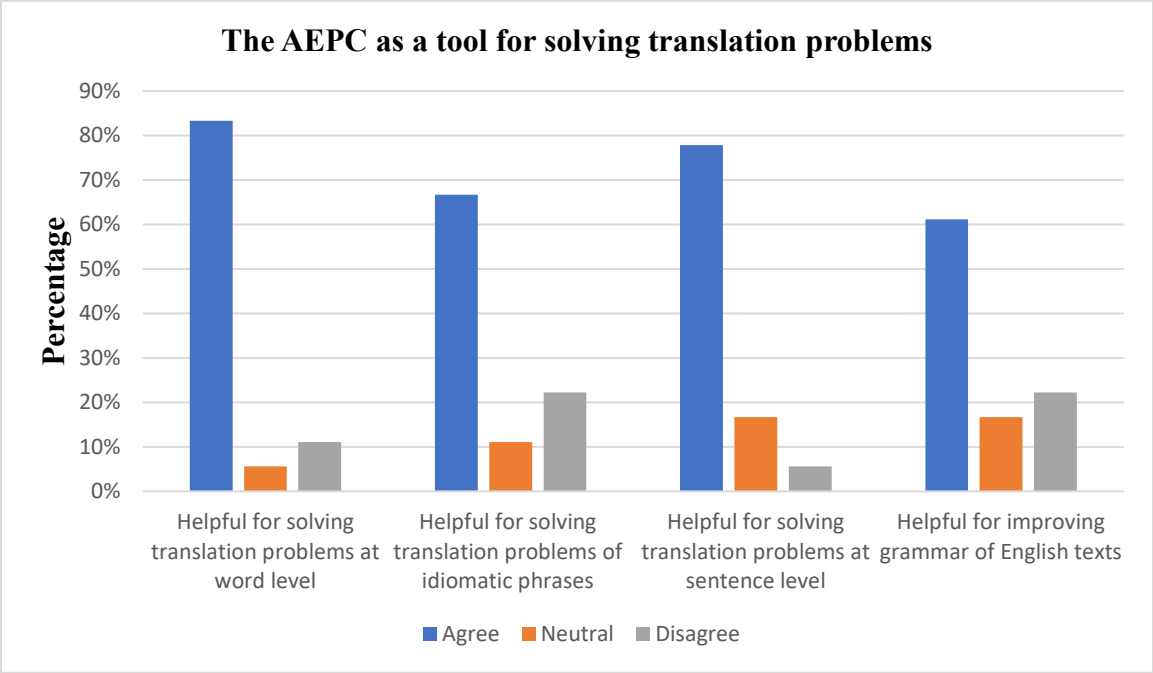


Table 4.31.Descriptive statistics for the first section of the survey

The AEPC as a tool for solving translation problems	Agree	Neutral	Disagree
Helpful for solving translation problems at word level	15 (83.3%)	1 (5.6%)	2 (11.1%)
Helpful for solving translation problems of idiomatic phrases	12 (66.7%)	2 (11.1%)	4 (22.2%)
Helpful for solving translation problems at sentence level	14 (77.8%)	3 (16.7%)	1 (5.6%)
Helpful for improving grammar of English texts	11 (61.1%)	3 (16.7%)	4 (22.2%)

A positive tendency was associated with the third component as well. The results illustrate that over half of the respondents (83%) found the AEPC to be effective for solving translation problems at the word level. A smaller percentage of the respondents expressed disagreement (11.1%), whereas about 6% held a neutral position. As for the second statement, many respondents (66.7%) showed agreement that the parallel corpus helped them at the idiomatic level. Approximately 22% reported otherwise and 11.1% remained neutral. For the

third statement, the majority of the respondents agreed (77.8%) that the use of the AEPC was effective for addressing translation problems at the sentence level. Only 5.6% expressed disagreement, with 16.7% being neutral. Lastly, while most of the respondents expressed agreement with the AEPC being helpful in improving English grammar, about 22.2% reported the opposite and 16.7% were neutral.

4.3. Summary of the Chapter

In this chapter, I offered a quantitative analysis of the results obtained from the EPE and translation exams. The analysis suggests that the data from the EPE followed a normal distribution. In addition, the analysis revealed that the participants in both groups were homogeneous and were all at a similar level of language proficiency in English. Furthermore, the analysis of the translation exams offered supporting statistical evidence for the role of PCBT in improving students' translation quality. This result was also supported by the analysis of students' responses in the survey. In the next chapter, I will discuss these results in greater depth to gain further insights on the role of PCBT in translator education.

CHAPTER 5: DISUSSION OF THE RESULTS

This chapter provides a discussion of the results obtained in Chapter 4. It begins with revisiting the two research questions, each of which is followed by a detailed discussion of the findings highlighting the role of PCBT. The chapter then presents a discussion of the students' responses to the survey. Finally, the chapter concludes with some general observations noted while conducting the experiment. I believe such observations are worthy of discussion and can provide seeds for future experimental studies.

5.1. A Discussion of the Results

5.1.1. Addressing the First RQ

The first research question this study posed was: Does PCBT affect the number of errors in student translations? To answer this question, I analyzed student translations in both groups and found that students in the EG had fewer counts of translation errors than their peers in the CG. We also saw in Chapter 4 that this resource did not only lead to a significant difference in performance between the two groups, but it also had a significant effect size (i.e., practical significance) on reducing the number of translation errors in the EG. Based on these results, I can safely claim that PCBT does play a significant role in enhancing the quality of student translations. In other words, students who have been taught to use the AEPC produced translations with fewer errors when compared to their peers who used dictionary resources only.

Unlike the use of traditional resources, the use of the AEPC has given students in the EG the opportunity to explore a wide repository of translations in authentic contexts, through which they observed different translators' behaviors in dealing with various linguistic and translational

issues. The AEPC has also provided them with a means to verify their choices when translating rather than merely relying on their intuition, which has reflected on their performance on the translation task. Now, what I observed from the data is that translating with the assistance of the AEPC has raised the bar of student performance in translation and led to higher translation quality compared to their peers in the CG. Yet, the question of whether students have developed translation competence that is transferable to situations where they have no access to the AEPC is unexplored and requires further investigation. This could be done through what is known as a delayed posttest to assess information retention over time.

The results I found for the efficiency of corpus integration into translator education were consistent with other research in the literature (Pearson, 2003; Kübler et al., 2018; Liu, 2020; Bernardini, 2022). While empirical research on the use of parallel corpus is limited and is still "needed in order to assess the benefits of corpus-informed translation (…) for translation learning" (Laviosa and Falco, 2023, p. 28), several previous studies assert that the integration of parallel corpora into translation teaching leads to greater translation quality in several different areas, such as selecting correct terminology, overcoming genre-specific translation issues, finding equivalent collocations, and so on.

Liu (2020), for instance, has found supporting evidence through empirical research in favor of integrating parallel corpora into translator education. He concludes that translation quality has seen far more improvement through accessing a parallel corpus than merely relying on traditional resources. By leveraging a corpus, students successfully managed to mitigate their translation deficiencies on multiple levels, with more noticeable improvement in L1 to L2 translation. Liu asserts that the "one-to-one sentence alignment design in the parallel corpus

means that students can easily identify solutions to translation problems," (p. 140) often resulting in students' ability to overcome their linguistic and translation limitations.

Supporting evidence for the role of parallel corpora is emphasized by Pearson (2003). According to Pearson, the diversity of contexts is an important feature of parallel corpora that allows students to succeed in dealing with linguistic and translation deficiencies by exploring how expert translators deal with translation challenges in different ways through various contexts. This advantage is what sets parallel corpora apart from other corpus types, by providing students with a more effective and context-rich linguistic repository for their translation needs. Pearson argues that, while other corpus types have a place in translator education, parallel corpora are more convenient for and relevant to translation teaching. She maintains

> (i)t is our belief that parallel corpora have a role to play in the translator training environment, that students can use parallel corpora to help them with translation and that the findings from corpus-based studies of parallel corpora can, and should, inform the design and implementation of specialized translation courses (p.15).

Monzó-Nebot (2024) holds a similar position on the practical effectiveness of parallel corpora in improving translation quality. She maintains that, while parallel corpora usage assists with the identification of translation equivalents, their benefits in fact extend further beyond improved lexical or terminological knowledge. Monzó-Nebot illustrates that this corpus type also contributes to the development of students' phraseology and discourse knowledge in both the source and target languages by observing and analyzing the different aligned texts in the corpus. With the example of legal translation in her argument, she maintains that parallel corpora have the merit of "enhance[ing] students' knowledge of the conventions (and possibilities) in source and target systems" (p. 329). This is done by creating tasks that "develop attentiveness to

discourse features which allow trainees to understand the priorities of the professional field" (p. 329).

Similarly, based on an empirical project conducted at the University Pablo de Olavide of Seville (UPO) in Spain, Vigier-Moreno (2019) concludes that the benefits of integrating a corpus into translator education is "crystal-clear," (p. 99) asserting that corpora become even more indispensable when translating into an L2. Moreno has found empirical evidence for translation quality improvement when translating with the assistance of a corpus. He adds that "[t]his corpus-assisted, sophisticated method of analysing parallel texts in the target language helps to-be translators to make more pertinent and justified decisions, which in turn increases their self-confidence and autonomous learning" (p. 94).

The feasibility of parallel corpora to improve both translation teaching and translation quality is further stressed by Bowker (2024). She points out that parallel corpora are robust linguistic aids that work in the service of teachers for a wide range of pedagogical activities, including teaching translation theories, devising exercises for translation practice, and evaluating student translations. Bowker further maintains that another advantage of incorporating corpora into translator education is that they enable teachers to steer away from teacher-centered practices to more student-oriented ones, adding:

> [a]s digital texts became easier to access, the focus shifted to student-centred activities, such as teaching students how to design and build their own corpora – often dubbed disposable, *ad hoc*, or DIY corpora – to be explored as resources to support in-class or homework activities (p. 378)

As for students, Bowker also indicates that parallel corpora can be leveraged to improve students' translation quality. She clarifies that the contextual depth offered by parallel corpora

enables students to observe various patterns and aspects of translated language, helping them produce more natural translations in the target language. Bowker also emphasizes that a great advantage of parallel corpora is that they allow students not only to avoid guesswork and optimize their lexical and terminological choices, but also to "look beyond phrase or sentence-level contexts and focus on text-level characteristics, such as stylistic, discourse and genre-related features" (p. 273).

5.1.2. Addressing the Second RQ

The second research question in this study was: Does the use of PCBT affect the type of errors in student translations. The statistical analysis in Chapter 4 illustrates that PCBT did, indeed, have an impact on the types of errors students made in their translations. In other words, I found that students who had access to the parallel corpus, i.e., the AEPC, had fewer errors across multiple error types, based on the ATA error classification. The results also show that the use of the APEC has unexpectedly led to more errors in a few error types. In what follows, I provide an in-depth discussion of these error types per group, together with some examples from student translations. The discussion pertains only to error types that were found to statistically differ between both groups.

5.1.2.1. Target language mechanics

b. Spelling

- **Error in the control group (CG)**

As seen in Chapter 4, the subcategory of spelling—including both character and capitalization errors—was the most frequent error type, accounting for more than half of the total number of errors under target language mechanics. While students in the EG group also had

many spelling errors, students in the CG had far more spelling errors—a difference that was found to be statistically significant.

I assume that these spelling errors are attributed to three key factors. First, spelling errors constitute the majority of writing errors for learners of English (Llach, 2011), and the participants in this study fall within this category of learners. Second, English spelling errors become even more observable when learners' L1 has a regular spelling system that is intertwined with its pronunciation, whereby spelling corresponds to the way words are pronounced (James et al., 1993), as is the case with Arabic. For English learners, students appear to often likely apply the phonetic rule system of their L1 to their second language writing, according to Cook and Bassetti (2005). They argue that this pattern is obvious in most English spelling errors, showing that "L1 phonology plays an important role in determining L2WS [Second Language Writing System] spelling errors" (p. 51). As such, Arabic-speaking students usually have to grapple with the arbitrariness of English spelling and learn to overcome their inherent assumptions of how spelling works in English. This crosslinguistic difference may interpret the number of spelling errors we see in the sample of student translations. Such a case of phonetics-orthography interaction is clear in various instances from the CG translations, for example, the words *envairoment* for "environment," *exberteese*[12] for "expertise," and *naiberhood* for neighborhood, in TR 5C, TR 10C, and TR 14C's translation, respectively. Third, capitalization errors are also common in many Arabic-speaking student writings due to graphological differences between Arabic and English writing systems (Al-jarf, 2010; Khatter, 2019). Unlike English, Arabic does not have a system for capitalization, and letters only have a single style, usually written in a

[12] This misspelled word appears to show two different types of transfer: one resulting from the student's L1 (interlingual transfer), seen in the replacing the consonant /p/ for /b/ since it is not part of the Arabic phonetic system, and the other resulting from a wrong analogy and overgeneralization of the long vowel /ee/ in the student's L2 (intralingual transfer). See James, et al. (1993) for more on spelling error classifications.

cursive connected manner. This disparity expounds such instances where proper names or sentence beginnings, which are always capitalized in English, are found to be written in lowercase in many student writings in English (see Hussain, 2019; Qasem, 2020; Nisa et al, 2023).

To explore the nature of student spelling errors, I rely on Cook's (1997) typology of spelling errors. Cook classifies spelling errors into four categories: letter omission (deleting a letter), insertion (including additional letters), substitution (replacing a letter by another), and transposition (changing the position of letters). One can observe that many of the errors in student translations were repetitive and fell under these categories. For example, several spelling errors resulted from the deletion of a letter or more. Here are some examples from student translations in the CG, written in bold and italics for convenience.

TR 3C: "We could look at the ***enviroment*** through the different human activities […]"

TR 2C: "[…] but those who gathered in ***Stocholm*** in October of 1972 […]"

In the same vein, while not as frequent as omission, letter insertion surfaced in some translations. What appears to be common among these insertion cases is the addition of a double consonant. This could be ascribed to the orthographic and phonological similarity of some L2 words students already know, leading to what Carney (2006: p. 84) describes as "analogy errors," as is the case with TR 8C, confusing the first syllable of *different* with *definition*, or overgeneralizing double letter rules as in TR 4C and TR 13C, or to an arbitrary case of insertion as in TR 10C.

TR 4C: "[…] countries considering this ***shoutting*** about […]"

TR 8C: "[…] seems very hard to put a ***diffenition*** that covers […]"

TR 10C: "[…] the United Nations demonstrated an ***awarreness*** that the future […]"

TR 13C: “[…] environment is ***commonlly*** used word […]”

Under the substitution category, a few examples are also noted. Some of the substitution examples can be attributed to the possible influence of the L1 phonological system. As mentioned previously, the Arabic phonological system lacks the English phoneme /p/, often leading students to adhere to their L1 phonological system (Al-Busaidi & Al-Saqqaf, 2015; Aloglah, 2018) and, thus, substitute some words having the phoneme /p/ with the phoneme /b/. Such an obvious case of L1 interference is seen in TR 3C and TR 16C below. The other reason for substitution observed in these examples could be relevant to difficulties involving vowel perception and recognition, as is the case between the vowels /u/ and /o/ in TR 8C.

TR 3C: “[…] meaning is connected by a ***battren*** of […]”

TR 16C: “[…] environment and the ***bolitical*** ones […]”

TR 8C: “[…] they raised their voice saying welcome to ***pollotion*** […]”

Errors related to transposition constitute the least proportion in relation to other categories. Only three transposition errors appeared in the overall translations of the CG. Careny (2006) demonstrates that reversing letter order is common in less proficient learners of English and is caused primarily by “uncertainty” about the elements of a word structure as to which letter precedes the other.

TR 9C: “[…] developing countries about the human ***appraoch***, which […]”

TR 10C: “[…] vary between ***prespectives*** […]”

TR 16C: “[…] to have knowledge in these ***feilds***.”

It is also worth noting that spelling errors are not only limited to violations under these categories. Two additional spelling error patterns were also detected in some error cases. The

first pattern pertains to spelling errors that exhibit more than a single violation of the target word conventions within the same word. Let us consider the following examples:

TR 8C: "[…] the capital of ***sweeden***."

TR 2C: "[…] in October of 1972 under the name of the ***united nation*** […]"

TR 13C: "[…] in **Stock Hulm** city, the capital of Sweden."

TR 8C, for instance, exhibits two different spelling violations. The first violation results from inserting an additional grapheme (e); the second represents a lack of proper capitalization of the grapheme (s). Along the same lines, TR 2C shows a double violation, one representing a lack of capitalization of the proper noun and the other representing an omission of the grapheme (s). In the case of TR 3C, the double violation is seen, first, in the substitution of the vowel /o/ with /u/ and, second, in the insertion of an unnecessary space boundary within one word, resulting in what Carney (2006) designated as "split error" (p. 84).

The second pattern is realized in misspellings that result in different, but correct target language words. While the resulting words are considered orthographically correct but semantically different from the intended ones, such words have not caused any major changes in the meaning of the translated segments in which they occurred. In other words, the meaning is still largely maintained, and readers would rapidly recognize these words as misspellings based on their context. Such errors are caused either by an orthographic resemblance (*exited* for *excited* in TR 8C) or phonological similarity (*hole* for *whole* in TR 5C), or both (as in *their* for *there* in TR 6C).

TR 8C: "[…] Latin American people got ***exited*** […]"

TR 5C: "[…] the ***hole*** universe is an environment."

TR 6C: "[…] and ***their*** is also the social environment […]"

I will shift the discussion now to the other subcategory of spelling errors: case errors. Under spelling errors, about 24.7% of the errors belong to the subcategory of case errors in most translations. They were caused either by a lack of capitalization or improper capitalization. A relatively good number of capitalization errors pertain specifically to the proper noun (United Nations) as in TR 8C and to the country name (Sweden) as in TR 17C, while a few others result from not capitalizing the second word in the title as in TR 10C. Other errors belong to improper capitalization of some words, as in TR 5C.

TR 8C: "[…] of the ***united nations*** for human environment […]"

TR 17C: "[…] the capital of ***sweden***."

TR 10C: "The ***environment***"

TR 5C: "[…] Points of ***View*** were different […]"

- **Error in the experimental group (EG)**

The results in Chapter 4 show that spelling errors also represent the first most frequent error type under target language mechanics in the EG. However, it is important to note that students in the EG had fewer spelling errors than their peers in the CG, with a difference that was significant based on statistical benchmarks. The reduction in spelling errors was not only significant, but the effect size was considered also large, providing justification for the effectiveness of integration corpora into translator education.

One may, however, argue that the number of spelling errors is still relatively substantial despite students' access to the AEPC. While this claim holds some truth, I assume that such incongruity pertains to a number of factors. First, like students in the CG, several spelling errors were caused by L1 phonological interference. This is seen across multiple examples from student translation, as in TR 2E, "*naberhood*" for "*neighborhood*". Second, some students may have

focused heavily on meaning retrieval rather than on verifying spelling accuracy. This over-prioritization of meaning led to insufficient attention to orthographic precision. Third, since students transferred their final translations from the paper to the word-processer software (Microsoft Office Word), they may have inadvertently assumed that the auto-correction function is active, despite being made aware of otherwise prior to the exam, both verbally and in writing as a note on the exam booklet. Fourth, students could have simply assumed the accuracy of their spelling, leading them to refrain from using the AEPC to verify spelling precision and focus on other aspects of translation, such as fluency, faithfulness, etc.

It is worth noting that the spelling errors made by the EG fall along the same lines as those made by the CG. In other words, I found that their errors belonged to the same error categories proposed by Cook (1997). For example, TR 8E, TR 4E, TR 17E, and TR 2E made the following spelling errors: letter omission, insertion, substitution, and transposition, respectively.

TR 8E: "[…] of use can be ***chalenging***."

TR 4E: "[…] and perhaps, the ***survaival*** of the human […]"

TR 17E: "[…] and its economical and health ***affects*** […]"

TR 2E: "The industrial countries ***beleived*** that […]"

5.1.2.2. Meaning transfer errors

We saw in Chapter 4 that meaning transfer errors represented the largest proportion of errors for both the CG and the EG, compared to errors under target language mechanics and writing ability. The results indicated that students in the CG had more errors than the EG on the following subcategories of meaning transfer: terminology/word choice, omission, literalness, cohesion, misunderstanding of the ST, verb form, and indecision. However, the results further

suggested that the difference between the CG and the EG was considered statistically significant only in terms of the first three subcategories: terminology/word choice, omission, literalness.

Before delving into the discussion of these errors, I would like to highlight that while reviewing the literature on translation quality evaluation, my intention was to look for an assessment model that not only offers objective measures for assessing translations but also classifies errors according to categories and subcategories. Since terminology/word choice errors appear to have the largest proportion of errors in this study and many others (see, for instance, Koby, 2015; Dewi, 2017 to name a few), I attempted to classify such errors based on some error typologies from the literature, just as I did with spelling. Among the reviewed models, such as the SICAL, LISA, TAUS, and House's model, I could not find one that has widely addressed the point of terminology/word choice errors in great detail. Even the one currently adopted in this study, the ATA framework, proposes only one subcategory for terminology errors, *faux ami* (or false friends). Having said that, I attempted to classify such errors based on their nature of occurrence. These errors can be categorized as 1) flawed selection decision; 2) semantic approximation; and 3) inconsistency. The meaning of each category, along with some examples, is discussed in the following section. I must highlight that this categorization is by no means exhaustive and does not mean to enlist all potential terminology/word choice errors. It is merely on the basis of the errors I observed in the limited corpus of student translations. In the next section, I will focus my attention only on the subcategories that have been found to differ significantly between both the CG and the EG.

d. Terminology/word choice

- **Errors in the control group (CG)**

The results in Chapter 4 showed that terminology/word choice errors constituted the first most frequent error type under meaning transfer errors. These errors occurred because of an erroneous selection of a target term or word in relation to its corresponding ST one. The results showed there were twice as many terminology/word choice errors in CG as in the EG—a difference which was also found to be statistically significant.

As mentioned earlier, terminology/word choice errors can be looked at in terms of 1) flawed selection decision; 2) semantic approximation; and 3) inconsistency. The first category, flawed selection decisions, reflects such instances where simply an irrelevant TL lexical choice has been assigned to the original term/word. I am, however, unsure whether the selected erroneous term/word resulted from a legitimate absence of knowledge of the corresponding TL term/word or stemmed from an accidental oversight or haste. This requires further investigation. For example, TR 6C used the phrase *provided evidence* to translate the word استشهدت/[cited], and TR 11C used the word *Switzerland* to render السويد/[Sweden]. Both cases demonstrate irrelevant choices to the intended target ones and, thus, indicate a flawed selection decision, the nature of which poses a question of whether this selection is driven by a deficit in language proficiency or by merely an oversight.

The category of semantic approximation represents such occasions in which students opted for words that exhibit a relative degree of semantic similarity or relevance to the intended ones. This is realized in the students' attempt to offer what seemed to be the closest meaning of the intended SL term/word. For example, TR 1C was most likely aware of the Arabic terms (الدول الصناعية والدول النامية) [*developing* and *developed* countries] and understood their meanings but was unfamiliar with their corresponding equivalents in English. He attempted to translate them with other L2 lexicons to approximate their meanings, thus opting for the two words

productive and *growing countries*. A similar attempt at using semantic approximation is found in TR 14C's rendition, in which he opted for a hyponym (*farming*), i.e., a subtype under a blanket term, to substitute the original adjective (agricultural).

TR 1C: […] between the ***productive*** counties and ***growing*** countries […]"

TR 14C: "We can say something like the ***farming*** environment, and the industrial […]"

The third category, inconsistency, corresponds to cases in which inconsistent terminology/word choices are evident. Errors of this sort constitute the least proportion of overall terminology/word choice errors and are observed in only a few translations. For example, TR 2C alternated between the use of the words *pollution* and *contamination*, without clearly distinguishing the nuances of meaning between both words. This is also evident in TR 9C's rendition, in which he maintained consistency with using the word *environment* and then shifted to using the word *ecosystem* in a context where it was not applicable.

In the analysis, I found that certain terms/words from the ST were frequently mistranslated, which resulted in marking them as highly frequent mistranslated terminology. These constitute what the PACTE (2017) identifies as *Rich Points* and defines them as "source-text segments that contained prototypical translation problems" (p. 109). Such rich points include: الدول النامية - الدول الصناعية - الجنس البشري - استشهدت [developed countries – developing countries – human race – cite (v)). I, therefore, will take these rich points as a benchmark and starter point, as I did with spelling errors, for evaluating the performance of the EG on such rich points.

- **Errors in the experimental group (EG)**

The results in Chapter 4 indicated that, like the CG, terminology/word choice errors constitute the first most frequent error type under meaning transfer in the EG. However, students

in the EG exhibited a better performance with fewer terminology/word choice errors in their translations compared to the students in the CG. Based on the statistical analysis, the difference was not only statistically significant but also considered comparatively large.

Taking the rich points highlighted earlier as a benchmark for comparison, it was evident that most students in the EG were able to translate these terms/words correctly, despite a few mistranslations by some others. The AEPC offers direct target equivalents for such terms used in context, allowing students to better understand their meanings and to integrate them in their translations. Both Figures below illustrate how the AEPC offer direct equivalents for two terms used in the translation exam: الجنس البشري [the human race] in Figure 5.1 and Figure 5.2 for the term الدول النامية [developing countries], respectively.

Figure 5.1.AEPC query for the term الجنس البشري

In English	In Arabic	Text From
"Persistence and determination alone are omnipotent. The slogan "press on" has solved and always will solve the problems of the **human race**." Calvin Coolidge - Thirtieth president of the United states	الإصرار والتحديد شئ جيد والشعار " اضغط على" قد حل ودائماً سوف يحل مشاكل **الجنس** كالفن كولدج-الرئيس **البشري**)الثالث عشر للولايات المتحدة الأمريكية)	**Title:** How to Get from Where You Are to Where You Want to Be. More info
that premature death must in some shape or other visit the **human race** . . .	فالموت بأسباب غير طبيعية بشكل أو بآخر يباغت **الجنس البشري**. . .	**Title:** Seven Elements That Have Changed The World More info
They push **the human race** forward.	إنهم يقودون **الجنس البشري** إلى الأمام.	**Title:** Steve Jobs More info

Figure 5.2.AEPC query for the term الدول النامية

In English	In Arabic	Text From
It did not apply to **developing nations**, including China and India, and was never ratified by the US or Australia.	فهو لا ينطبق على **الدول النامية** بما فيها الصين والهند ولم تُصدّق عليه الولايات المتحدة أو أستراليا	**Title:** Seven Elements That Have Changed The World More info
we are working with **developing country** ministries, utilities, and end-users to build the kind of institutional and market structures that will encourage investment in the energy sector.	ونحن نعمل مع الوزارات، ومؤسسات المنفعة العامة والمستخدمين للطاقة في **الدول النامية** من أجل إقامة نوع المؤسسات وهيكليات السوق التي ستشجع الاستثمار في قطاع الطاقة.	**Title:** Clean Energy for Tomorrow More info

Notwithstanding the potential benefit of the AEPC for directly accessing TL equivalent terms/words, students in EG groups also exhibited terminology/word choice errors that fall along the same error categories I highlighted earlier, namely, 1) flawed selection decision; 2) semantic approximation; and 3) inconsistency. Under the first category of terminology errors, TR 7E and TR 11E, for instance, appeared to have a flawed selection decision of the intended target words and chose words that had no relevance to the indented ones. TR 8E used the adverb *culturally* in place of *socially*, and TR 11E opted for the country name, *Sweden*, while the ST uses the city, *Stockholm*.

TR 8E: "[…] the economic, health, and ***cultural*** pollution […]"

TR 11E: "[…] those who met in ***Sweden*** in October […]"

Some terminology/word choice errors also fell under the second category of semantic approximation. This is observed in the translations of TR 1E, TR 2E, and TR 9E. Like some

students in the CG, both TR 2E and TR 9E used the exact same rendition of the term *developing countries* as *growing countries* in an attempt to approximate its meaning. As for TR 1E, he used the noun phrase *the maintaining of* instead of *the survival*.

TR 9E: "[…] believed that the ***growing*** countries should […]"

TR 1E: "[…] showed awareness that the future of development, and probably even ***the maintaining of*** mankind […]"

As in the CG, errors resulting from inconsistency—the third category—were the least frequent and were detected in only two cases. For example, the designation of "developed and developing countries" is consistent throughout the ST, yet both TR 10E and TR 14E exhibited some inconsistencies in using the corresponding terms. TR 10E alternated between the terms *industrial* and *high-income* countries. Although both terms can be used interchangeably in specific contexts, not all high-income countries are industrial or developed since some are considered high-income countries but are still part of the developing nations, as indicated by Fantom, and Serajuddin (2016). In the same vein, TR 14E switched between the terms *developing countries* and *third-world countries* without capturing the nuances of meaning between both options, i.e. the likely negative connotations linked with the designation of *third world*.

TR 10E: "[…] of ***industrial countries*** and developing countries […] as long as individuals in ***high-income countries*** have […]"

TR 14E: "[…] industrialized and ***developing countries*** on how to […]. Industrialized countries believed that ***third-world countries*** […]"

The improved performance of the EG indicates that translating with the assistance of the AEPC most likely helped students overcome linguistic deficiencies pertaining to

terminology/word choice knowledge. In other words, using the AEPC as a main translation aid assisted students to look for the terms/words they needed by navigating through a plethora of translation options and giving them an opportunity to explore how these words were translated, consequently leading to improved accuracy. Salkie (2002) has a similar perspective, explaining that "we often find that the corpus contains correspondences which are not mentioned in dictionaries" (p. 52).

It is important to note that this does not imply that paper dictionaries do not suffice as a linguistic resource. Paper dictionaries are of course rich resources and provide large repository of linguistic data. However, some dictionaries, either too general ones or older versions, do not necessarily offer sufficient coverage of specialized words or context-dependent ones. This is evident, for instance, in two fairly recent English<>Arabic dictionaries, which are widely used by many Arab students of English. While the Oxford English<>Arabic dictionary (2010) lacks an entry of the word *sitcom* as in Figure 5.3., Al Mawrid Al Hadeeth Dictionary (2017) lists the word as in Figure 5.4., but it offers neither a definition in Arabic nor a contextual example to clarify its meaning.

Figure 5.3. The Oxford English<>Arabic dictionary

Figure 5.4.Al Mawrid Al Hadeeth Dictionary


الشرقية: «أ» ريح حارة مثقلة بالغبار، تهب على سواحل البحر الأبيض المتوسط الشمالية. «ب» كل ريح حارّة مزعجة.

sir·up; sir·up·y [sĭr′-] = syrup; syrupy.

-sis pl. -ses لاحقة معناها: عمليّة؛ عَمَل <thesis>.

si·sal [sī′səl; sĭs′-] *(n.)* السِّيزال: «أ» نبات تُتَّخذُ من أليافه حبال متينة بيضاء. «ب» ليف السِّيزالِ الأبيضُ المتينُ.

sis·kin [sĭs′kĭn] *(n.)* السُّمَيْلَى؛ السُّكين: عُصفور كالحَسُّون.

sis·si·fied [sĭs′ĭ fīd′] *(adj.)* = sissy 5-6.

sis·sy [sĭs′ĭ] *(n.; adj.)* (١) أخت (٢) فتاة (٣) فتًى أو رجل مُخَنَّث (٤) الجبان؛ المخلوعُ الفؤاد § (٥) مُخَنَّث (٦) جبان.

sis·ter [sĭs′tər] *(n.; adj.)* (١) «أ» الشَّقيقة. «ب» أخت غير شقيقة. «ج» أخت الزوج أو الزوجة. «د» امرأة الأخ. «هـ» امرأة أخي الزوج (٢) *cap.* ا.ك: «أ» راهبة؛ أخت. «ب» الأخت: امرأة من أعضاء كنيسة نصرانية ما (٣) ممرِّضة (٤) «أ» فتاة؛ امرأة. «ب» شخص <for the benefit of the weaker ~s> § (٥) شقيقة <~ societies>.

sis·ter·hood [sĭs′tər-] *(n.)* (١) الأُخْتيّة: كون الفتاة أو المرأة أختاً (٢) ...

to ~ on a committee يشترك في عضوية لجنة.

to ~ out (١) يمتنع عن المشاركة [وبخاصة في رقصة] (٢) يبقى إلى آخر الحفلة إلخ (٣) يقعد في الهواء الطَّلْق.

to ~ through يبقى إلى آخر الحفلة أو الاجتماع.

to ~ tight (١) يستقرّ ثابتًا في مكانه [وبخاصة على صَهْوة الجواد] (٢) لا يتحرك (٣) يَلْزَم السكون [وهو مُخْتَبِئ أو وكأنه مختبئ] (٤) يتمسّك بآرائه أو أهدافه.

to ~ under يَحْضُر الصَّلاة أو الدروس أو المحاضرات عند كاهنٍ ما أو أستاذٍ ما.

to ~ up (١) يستوي جالسًا [في فراشه] (٢) يُطيل السَّهَر.

to ~ upon = to sit on.

si·tar [sĭ tär′] *(n.)* السِّيتار: آلة موسيقية هندية شبيهة بالعُود.

sit·com [sĭt′kŏm] *(n.)* = situation comedy.

sit-down [sĭt′doun′] *(n.)* إضراب القعود؛ الإضراب الملازم: إضراب عن العمل يَلْزَمُ فيه المُضرِبون مراكزَ عملهم إلى أن تُحقَّق مطالبُهم.

site [sīt] *(n.; vt.)* (١) «أ» مَوْقِع؛ مكان. «ب» موقع الشبكة (را. Web site) § (٢) يختار أو يُعَيِّن الموقع [لمبنًى يُراد إنشاؤه].

sit-in [sĭt′ĭn′] *(n.)* ...

The enhanced performance in terms of terminology errors could be also linked to the difference in the structure of data presentation and the time required to retrieve such data. The AEPC offers immediate access to the queried items, which are often presented in multiple contexts, therefore allowing students to quickly obtain the meaning of the terms and simultaneously verify their usage through the various examples offered. In contrast, due to the physical nature of dictionaries, retrieving meaning not only takes a longer time compared to a parallel corpus but also requires additional measures to verify their usage due to limited

examples given, or even their complete absence, as seen in the above figures. For these reasons, using a parallel corpus in translation is more efficient, a finding that supports the adoption of PCBT in translator education.

e. Omission

- **Errors in the control group (CG)**

Based on the statistics in Chapter 4, omissions appear to constitute the second most frequent error type under meaning transfer for the CG. These errors resulted from leaving out meaningful parts from the ST untranslated. The results also indicated that students in the CG had nearly twice the number of omission errors compared to those made by their counterparts in the EG.

It is important to note that the omissions I investigated here are not the sort that are used as a pragmatic strategy for compensating non-equivalence in the ST (for more on such, see Chesterman, 1997; Dimitriu, 2004; Baker, 2018, to name a few), but rather the ones that, according to Humbley *et al.* (1999), result in "a translation error where the translator fails to render a necessary element of information from the source text to the target text" (p. 165). Klaudy (2003) argues that an erroneous omission results in loss of meaning and is, therefore, distinguished from Vinay and Darbelnet's (1995) notion of economy, which refers to the use of fewer words to express the same content. Klaudy maintains that in omission, "we cannot speak about the 'same content', because, as a result of omission, certain meanings are lost in the TL text without being incorporated into other meanings" (p. 236). In the analysis, therefore, I will only highlight such omissions that resulted in one or more elements being left out of the ST without being compensated for in the TT. Let us now explore some of these examples within the CG.

The nature of the omissions varied across student translations. Like terminology/word choice errors, I could not find a classification for such errors in the literature, apart from Barik's (1997), which is mainly devoted to interpreting. As such, along the same lines of what I did with terminology errors, I will attempt to classify such instances of omission errors based on the cases I observed from student translations. It is also important to note that this classification is not intended to be exhaustive and does not mean to include all types of omission errors.

The omission errors found in the corpus of student translations belong to the following omission types: 1) textual, 2) extra-textual, 3) conceptual, 4) informational, and 5) structural. Under textual omission errors, students' omission ranged from an omission of one lexical item to those encompassing an entire phrase. No omission of a whole sentence was observed. TR 7C, for example, appeared to have an omission at the word level, while TR 3C showed an omission at the phrase level, both of which resulted in a partial meaning loss of the intended ST meaning. The bold, underlined word(s) in the ST and T (my translation) are the ones omitted.

ST: (...) أظهروا **وعيا** بأن مستقبل التنمية (...)

T: […] showed **awareness** that the future of development […]

TR 7C: "[…] showed that the future of development […]"

ST: (...) وعلى الرغم من اختلاف وجهات النظر **فيما يتعلق بأسلوب التعامل مع البيئة** (...)

T: […] despite the differences in opinions **concerning the appropriate course of action with regard to environment**, those who met […]

TR 3C: "[…] despite the differences in opinions, those who met […]"

Extra-textual omissions refer to non-textual information omissions. For example, two occasions of intensification appear in the ST, in which the author uses double angle brackets around two words. Some students removed the symbols in their rendition and, in so doing, failed

to convey the intended intensification by the author. This intensification could have been compensated for either by italicizing the entire word, by capitalizing it, or by using the same angle brackets.

ST: (...) إلا أن الدول النامية اعتبرت هذا «الصراخ» (...)

T: […] developing nations contended these «cries» against […]

TR 17C: "[…] developing countries considered this scream about […]"

The third omission type, conceptual omission, refers to the deletion of a main concept from the ST. It is important not to confuse conceptual and textual omissions. Textual omission is ascribed to the omission of individual words, which could be articles, adjectives, nouns, etc. Conceptual omission goes far beyond the deletion of words and entails overlooking broader meanings that are holistic, granular, and, thus, essential to the understanding of the ST. TR 2C, for instance, did not simply exclude an individual word in the example below from his rendition, but in fact an entire concept pertinent to the theme of the text, which discusses the subject of "environment."

ST: (...) والبيئة الصناعية والبيئة الثقافية و**البيئة الصحية** والبيئة الاجتماعية (...)

T: […] industrial, cultural, **health**, and social environments […]

TR 2C: "[…] the industrial environment, the cultural environment, and the social environment […]"

Informational omission represents the exclusion of essential information from the ST in the TT. Information could pertain to the name of a place, an institution, a date, or a number. Several examples were observed and belonged to this category. For example, TR 9C deleted three essential elements in his translation, one that belongs to a city, the other to a date, and the other to an organization's name.

ST: (...) ممن اجتمعوا في **ستوكهولم** في **أكتوبر** من عام **١٩٧٢** تحت **مظلة الأمم المتحدة** أظهروا وعيا (...)

T: […] who met in **Stockholm** in **October 1972**, under the auspices of the **United Nations** showed awareness […]

TR 9C: "[…] attendees at the conference expressed awareness […]"

The last omission type, structural omission, refers to leaving out important structural elements from the ST, such as headings and subheadings. Only a few students from the CG, for example TR 4C, and TR 10C, started translating the text immediately, leaving the title untranslated in their TT. Titles perform important functions, and so excluding them from the translations poses a notable concern. Such omissions can lead to clarity issues and impact the understanding of the TT.

I am unsure as to why students in the CG had such omissions, an area that requires further investigation. However, such omissions could presumably be attributed to various reasons, some of which are highlighted here. First, some omissions could have resulted from students' unfamiliarity with the corresponding TL words of the SL ones, therefore choosing to omit them in their translations without compensating for the loss resulting from such omissions. Second, it could also be the case that some students might have been familiar with the meaning of words they deleted in English yet lacked the correct spelling and chose to follow an easier route by deleting them rather than consulting a dictionary to check the correct spelling. Third, using a dictionary by default entails the existence of time lags, resulting from switching between the ST and the dictionary and, thus, could have contributed to the likelihood of students omitting some parts of the text—which they might have deemed unnecessary or problematic—to finish translating within the allocated time. This does not suggest that using a the AEPC does not involve time lags. Rather, this difference is reflected in how such tools assist with information

access and retrieval. Access to the AEPC provides students with a more efficient and convenient way for accessing information simultaneously, compared to the sequential nature of a dictionary that often requires longer time when flipping large number of pages to get to the same information. Finally, some omissions could be unintentional, resulting from a failure of transfer, in the sense that they inadvertently deleted the words during translation.

- **Errors in the experimental group (EG)**

The results introduced in Chapter 4 indicated that students in the EG had some omission errors like their peers in the CG. However, it was evident that such errors occurred less frequently in comparison to the CG. The difference between both groups was also found to be statistically significant. The infrequency of this error type could presumably be attributed to the following reasons. First, the AEPC could have likely provided students with a point of reference during the experiment, through which they explored different translation behaviors and learned to distinguish between acceptable versus unacceptable omissions. Second, access to the AEPC could have increased students' opportunity to look for the words with which they were not familiar, either in terms of meaning or spelling; therefore, they would not likely have the urge to omit them due to their unfamiliarity. Third, translating with the assistance of the AEPC could have most likely enabled students to reduce the time lags experienced by students who used paper dictionaries, enabling them to have more time not only to proofread the translations but also to scrutinize and cross-check them against the ST. These factors may explain the smaller number of omission cases compared to those of the CG.

The omission errors made by students in the EG fall under the same categories I hypothesized earlier. I observed errors that belonged to textual, extra-textual, conceptual, informational, and structural omissions. Under textual omissions, TR 10E, for example, appeared

to have deleted an individual word, while TR 16E deleted a phrase. Like some students in the CG, TR 13E had a case of extra-textual omission seen by deleting the double angle brackets used for intensification. Under conceptual omission, TR 3E omitted the concept of *environmental pollution* on its first mention in the TT and replaced it with *issues*. TR 2E exhibited an instance of informational omission by removing the country from the TT. Lastly, TR 17E demonstrated a structural omission through translating the text with the exclusion of its title. Examples from the EG of each omission category are presented below in accordance with the order of discussion[13].

ST: (...) أن تبقى الدول النامية دون خطط تصنيع (...)

T: […] developing countries should remain without industrial plans […]

TR 10E: "[…] developing countries should remain without plans […]"

ST: (...) أن وضع تعريف شامل للبيئة يستوعب مجالات استخدامها المختلفة لا يتيسر بسهولة (...)

T: […] endorses the complexity of formulating a comprehensive definition of "environment" that accommodates its diverse utilitarian domains […]

TR 5E: "[…]it is not easy to provide a comprehensive definition of the environment[…]"

ST: (...) لأن ذلك يؤدي إلى تلويث البيئة مما ينتج عنه مضاعفات (...)

T: […] can lead to environmental pollution, resulting in subsequent repercussions […]

TR 3E: "[…] plans due to the potential issues that could result in […]"

ST: (...) من أفريقيا وأمريكا اللاتينية وارتفع صوتهم بالقول «مرحبا بالتلوث» (...)

T: […] from Africa and Latin America shouted «welcome pollution» […]

TR 13E: "[…] from Africa and Latin America were enthusiastic and said, welcome pollution […]"

ST: (...) انعقد في عام ١٩٧٢ بمدينة ستوكهولم، **عاصمة السويد**، مؤتمر الأمم المتحدة (...)

[13] The mission of the title, *structural omission*, is not included in the examples for convenience purposes, as we cannot include the entire translation just to demonstrate the missing title.

T: […] In 1972, Stockholm, **Sweden**, hosted the United Nations […]

TR 2E: "[…] In 1972, Stockholm hosted the United Nations Conference […]"

f. Literalness

- **Errors in the control group (CG)**

The analysis in Chapter 4 illustrated that the CG exhibited a wide range of literalness errors, ranking as the third most frequent error type under meaning transfer. Such errors resulted mainly from following a literal translation that led to unclear meaning in the TT. It was found that the EG group had far more errors of this type compared to those made by the EG.

The tendency to adhere to a small unit of translation, that is, an individual word, is a typical behavior of novice student translators, demonstrating, in most case scenarios, "characteristics of a text that indicate that it has been translated from another language" (Champe, 2000, p. 1421). Frankenberg-Garcia (2015) makes a similar remark, suggesting that novice inexperienced translation students are more reluctant to distance themselves from literal translation compared to more experienced ones. Such an observation has been supported in the literature of process-oriented translation research from early studies, such as (Kussmaul &Tirkkonen-Condit, 1995; Lörscher,1996; Jensen, 1999; Tirkkonen-Condit; 2005) to more recent ones, such as (Schaeffer, 2013; Halverson, 2015; Carl & Schaeffer, 2017). The same proposition is held by Baer and Mellinger (2020) who suggest that "student-translators are often reluctant to alter source-text patterning, resulting in awkward-sounding texts lacking in cohesion" (p. 4). The arguments in such studies illustrate that translation progresses from a default process of literal translation, one that adheres to bottom-up processing, to a less literal top-down one, depending on the level of expertise.

A literal translation may work in some instances, especially between languages that are similar at certain linguistic levels (Hatim & Munday, 2019). However, in very distant languages, such as Arabic and English, literal translation typically results in an awkward or unnatural translation as we will see in the next section. One potential reason for novices' adherence to literal translation is that "the cognitive resources they have available are needed, to a large extent, for routine tasks (e.g., finding matches for words they are not familiar with)," compared to more experienced translators who have already automized this process and allocate their cognitive efforts to far higher tasks when translating (Göpferich, 2013, p. 67).

The literal translation of the segments I explored are the ones that failed to convey a clear rendition of ST. They resulted from students' attempts to follow the ST as closely as possible, therefore producing unacceptable translations. The errors varied in nature, some of which arose from following the exact structure of the ST, others from rendering literally a lexical item, collocation, or phrase. Here are some examples.

ST: (...) ويتطلب أن نلم كل من هذه المجالات **بإطار** (...)

T: […] necessitating an understanding within each specific **scope** of these fields […]

TR 14C: "[…] requires knowledge of every **frame** of these fields […]"

In the above example, the ST word is polysemous and has multiple meanings, such as *frame*, *framework*, or *scope*, depending on the context in which it occurs. TR 14 selected the surface, the most common meaning, which resulted in a literal, awkward rendition that did not fit in the TT context. If we assumed that TR 14C used a dictionary to clear out any confusion, many Arabic-English dictionaries offer word meanings of polysemous words decontextualized without giving examples, consequently not capturing the nuances in different threads of meanings. Almujaiwel (2012) notes the very exact issue with the *al-Mawrid*, a seminal Arabic-English

dictionary, and argues that among the issues found in this dictionary is its "failure (…) to offer a precise sense for a polysemous entry" (p. 62).

ST: (...) بسبب تصرفات الإنسان الخاطئة **في حق البيئة** (...)

T: […] due to misguided human interactions **against** the environment. […]

TR 2C: "[…] because of the human's wrongdoings **in the right of** environment […]"

Here, in this example, TR 2 provided a literal word-to-word rendition of the collocation "في حق" as *in the right of*, resulting in an unnatural rendition of the ST sentence. Such a literal translation reflects a complete disregard for the idiomatic expression, both in Arabic and English. In fact, it failed not only in delivering a more natural-sounding flow of the translation but also in conveying the intended ST sentence meaning. This example illustrates the importance of exploring both contextual clues and examples, which are deemed necessary when translating an unfamiliar word or collocation, yet both of which are limited in Arabic-English dictionaries (Nofal, 2012; Galal, 2015). Ali also holds the same position, arguing that the issue with some Arabic-English dictionaries goes further beyond the unavailability of definitions and examples to the fact that "most of the Arabic collocations are not included in Arabic-English dictionaries such as Wehr's Dictionary of Modern Written Arabic and the al-Mawrid Arabic-English Dictionary," both of which are considered the main resort for many ESL and translation students (p. 27).

Literalness errors can also result from adhering to the ST formal structure. In the example below, TR 6C transferred the exact ST structure of Arabic main and subordinate clauses. He rendered both of the Arabic conjunctions *على الرغم* [although/despite] and *إلا أن* [however] together in the TT. While Arabic uses both conjunctions together to highlight emphasis, using the same in English is redundant and incorrect.

ST: (...) وعلى الرغم من اختلاف وجهتي النظر فيما يتعلق بأسلوب التعامل مع البيئة، **إلا إن** الذين (...)

T: […] Despite the two different perspectives concerning the appropriate course of action with regard to environmental management, those who […]

TR 6C: "[…] Although the two views differ regarding the way to deal with the environment, **but** those who met […]"

- **Errors in the experimental group (EG)**

Literalness errors also appear to take place in the translations of the EG. Based on the analysis presented in Chapter 4, they represented the third most frequent error subcategory under meaning transfer, the same as in the CG. However, students in the EG had fewer literalness errors compared to their counterparts in the CG, with a difference that was considered statistically significant.

The route to go beyond the word-level renderings could be attributed to the use of the AEPC. This observation is echoed in other research (Frankenberg-Garcia, 2015; Liu, 2020; Tian, 2020), contending that the use of a parallel corpus in translation can "boost [novice] translators' confidence, helping them to adopt bolder, less literal translation strategies" (Frankenberg-Garcia, 2015, p. 2) and help them become "less bound to the source material and feel much more confident when deviating from the way things are expressed in the source material" (Varantola, 2003, p. 67).

Such occasions of literal translation in the EG are, however, expected and normal since students are considered novice translators. Tirkkonen-Condit (2005), in fact, argues that literal translation is the default mechanism of translation and continues to be so until it is disrupted by a "monitor" that, first, warns against a problem in the translation and, second, suggests a consciously informed decision to overcome the problem (p. 408).

While the monitor system of performance is not the subject of this research[14], it suffices to note that the system develops synchronously with the development of both self-awareness and expertise and, accordingly, enables students to attend to translation issues, stemming from literal renditions that result in an unnatural TT (Tirkkonen-Condit, 2005). Our argument suggests that such a monitoring capacity is perhaps improved in the EG, which interprets the fewer literalness errors for two reasons. First, accessing the AEPC might have given students the opportunity to navigate through a plethora of professional translations by expert translators, against which they compared their own translational choices. Through such regular and intentional comparisons, they had most likely enhanced self-awareness mechanisms, leading them to notice the deficiencies that existed in their translations and, therefore, explore possible avenues for performance development. Second, such an intentional and deliberate practice (Shreve, 2006) to improve their deficiencies is likely to contribute to developing their translation expertise. Shreve proposes that both the intentional endeavor and the goals set toward improving one's self performance are essential for expertise development and suggests that these two factors are what distinguish translation expertise from merely building up experience. He argues that

> Expert performance is demonstrably an acquired skill, and (…) the single biggest factor in the evolution of expertise is deliberate practice. The difference between deliberate practice and simply accumulating experience at performing the activity is important. While the accumulation of experience in the domain is a necessary condition for expertise, it is not sufficient (p. 29).

The literalness errors made by students in the EG fall along the same lines as those made by their counterparts in the CG. They resulted from following the ST formal structure and

[14] See The Monitor Model Revisited by Tirkkonen-Condit (2005) for more information.

offering a literal, one-to-one correspondence of some ST words. In the first example, the ST word مضاعفات is a polysemous word with three meanings, two of which are related (*multiplications* and *duplications*,) the third is not (*repercussions*). TR 3E used the irrelevant meaning, which did not fit in the context of his translation, resulting in a literal, incorrect rendition. Similarly, TR 12E had literalness errors that resulted from his attempt to render the formal structure of the ST.

ST: (...) مما ينتج عنه **مضاعفات** وأضرار في مختلف مجالات عيش الإنسان (...)

T: […] resulting in damages and **repercussions** across various facets of human existence […]

TR 3E: "[…] lead to numerous **multiplications** in human life […]"

ST: انعقد في عام ١٩٧٢ بمدينة ستوكهولم، عاصمة السويد، مؤتمر الأمم المتحدة للبيئة البشرية.

T: In 1972, The UN conference on human environment was held in Stockholm, Sweden.

TR 12E: "Held in 1972 in Stockum in Sweden the United Nations conference on human environment."

5.1.2.3. Writing ability errors

The category of writing ability consists of the following subcategories: usage, register, and style. As seen in Chapter 4, errors resulting from writing ability represent the least proportion of errors for both groups, compared to errors that belong to target language mechanics and meaning transfer. It is important to remind readers that while the EG appeared to have fewer writing ability errors, there was no statistically significant difference between the CG and EG on the three subcategories of writing ability errors: usage, register, and style. That is, both groups exhibited similar proficiency with regard to their writing ability.

However, while one may suggest, based on the statistics, that the linguistic aid used during translation, be it the AEPC or a dictionary, did not essentially lead to substantial linguistic

disparities in their translation performance, the analysis of the effect sizes yielded a more promising result. Based on the statistics, there was evidence of practical significance of the intervention of the three subcategories, with a moderate effect of the intervention for *usage* errors and small effect for both *register* and *style*. Small effect sizes, despite being marginalized or typically ignored, can in fact be meaningful or impactful when applied to larger populations (Carey et al., 2023). Prentice and Miller (1992) suggest that large effect sizes are not necessarily more important than smaller ones. They maintain that small effect sizes may "have enormous [and] accumulate over time to become large effects" (p. 163). Echoing this point is Kraft (2020) who contends that many effective interventions in educations are dismissed by policymakers only for their small effective sizes, despite being impactful. He asserts that small effect sizes, based on Cohen's standards, "are often large and meaningful in the context of education interventions" (p. 18).

Back to the effect of the intervention, I assume that the APEC had only a partial impact on the category of writing ability for two reasons. First, I take into account the temporal restriction of the experiment, which may have affected the result. In other words, the study had a limited timeframe and was conducted over an 8-week period during the summer semester. It is likely that prolonged exposure to the AEPC, potentially throughout several academic semesters, may lead to more pronounced results, demonstrating a potentially greater impact on the quality of performance across the subcategories mentioned above.

Second, the ST length and type could have also played some role in the minimal number of errors I observed in both groups. The ST is relatively short and non-specialized. Longer and more specialized texts could have led to a more nuanced comparative stance in the sense that I

would have been able to see how the AEPC may help students leverage the features of the AEPC in translating these longer texts compared to their peers who used dictionaries only.

5.1.3. Errors Unique to the Experimental Group (EG)

In the previous section, I reviewed the common errors of students in the CG. I treated such errors as a benchmark in order to evaluate the performance of the students in the EG who received PCBT. I found that most students in the EG managed to overcome these errors and exhibited a statistically significant difference compared to their peers in the CG who received a traditional mode of teaching. Now, I will turn my discussion to the type of errors I found unique to the EG, in the sense that they were found to be repeatedly occurring in the EG, but not as often in the CG. Only errors that were found to statistically differ from the CG will be reviewed in detail. The others will be reviewed briefly.

The analysis in Chapter 4 revealed that the EG had more errors in the following five subcategories: grammar and punctuation (under target language mechanics) and addition, faithfulness, and ambiguity (under meaning transfer). Of these errors, only addition and punctuation errors significantly differ from those made by the CG, as discussed below. Addition errors

5.1.3.1. Addition errors

As highlighted above, students in the EG had far more erroneous additions in their translation than their peers in the CG. To interpret this result differently, I argue that translating with the assistance of the parallel corpus, the APEC, seems to have led students to have greater addition errors than when translating with the help of dictionaries. Before examining these errors in depth, it is important to clarify that the additions explored here are not those intended by students to explicitate what needs to be inferred from the contextual elements of the ST, or those

that correspond to establishing coherence in the TT through, for instance, certain conjunctions. My focus is on such additions that only introduced unnecessary elements of meaning, which were not available in the ST. While the reasons as to why the EG had more addition errors are beyond the scope of this study and require further investigation using other research tools, such as interviews or TAPs (Think-Aloud Protocols), I attempt to speculate on such reasons here.

First, the AEPC appeared to have offered students a great deal of support when it comes to verifying intuition or looking up certain terminology/word choices. Yet it also appears that it simultaneously led to wrong analogies, resulting in a false deduction from instances of expert translators' additions in the corpus. Students seemed unable to distinguish between permissible additions that are constructive to translating and those that are redundant. However, if there is something to merit in such additions, it is students' acquired skill of moving beyond the word level, even partly, and paying attention to units of meaning larger than a single word. I also argue that during the course of intensive practice over time, students are likely to control such a tendency and discern what sort of additions are meaningful and serve the TT readers.

Second, the inclination toward adding superfluous information was encouraged by students' disposition to over-translate[15] the ST. The wealth of authentic examples in the AEPC is tempting to consult every now and then; yet it evidently came at the cost of accuracy. The inclination toward adding unnecessary elements of meaning that were not-existent, directly or indirectly, in the ST was perhaps motivated, presumably unintentionally, by certain phraseology, collocations, or frequency of occurrence that students noticed during the multiple exposures to the corpus. For instance, the verb اختلف/[*differ*], along with its derivations, is most often

[15] The term "over-translation", often discussed in conjunction with "under-translation," was first introduced by Vinay and Darbelnet (1995). The term then gained popularity and was discussed by other prominent scholars, such as Duff (1981), Hönig & Kussmaul (1982) and Newmark (1988), among several others. It was also referred to as a *differentiated degree of precision*.

accompanied by a modifier in Arabic, a word, or a phrase. This frequent co-occurrence appears repeatedly across different renditions in the AEPC, where an adverbial phrase *إلى حد كبير* [*considerably*] modifies the verb *اختلف*/[*differ*] in figure 5.5, and the two adjectives *هائلة* [*enormous*] and *كبيرة*[*great*] modify the noun *اختلاف*/[difference] in figures 5.6 and 4.7 respectively. Such a tendency to over-translate the ST was observed in some student translations, where they introduced some unnecessary elements of meaning that were not originally in the ST. See, for instance, TR 11E's inclusion of the adjective جسيمة [serious] to modify the noun *مضاعفات* [*repercussions*] which was not part of the ST sentence.

ST: (...) مما ينتج عنه **مضاعفات** وأضرار في (...)

T: […] resulting in damages and **repercussions** across […]

TR 11E: "[…] leading to **serious** repercussions in […]"

Figure 5.5. An example from the AEPC for the verb differ.

كما أن الأطراف اختلفت، إلى درجة كبيرة، في النهج التي اتبعتها لاختيار السياسات والتدابير التي أدرجتها في الجداول الموجزة، التي ينبغي، وفقاً للمبادئ التوجيهية لاتفاقية الأمم المتحدة الإطارية بشأن تغير المناخ، أن تتضمن جميع السياسات الرئيسية، بل أن بعض الأطراف لم تقدم مثل هذه الجداول على الإطلاق.	Parties also differed considerably in their approach as to which policies and measures to include in the summary table, which according to the UNFCCC guidelines should contain all the principal policies, and some did not provide such a table at all. UN-2

Figure 5.6. An example from the AEPC for the noun difference.

فهناك اختلافات هائلة بين دول الاتحاد الأوروبي من حيث حجم القطاع العام لديها، ومدى المرونة التي تتمتع بها أسواق العمل لديها، وتقريباً كل المؤشرات الاجتماعية الاقتصادية التي قد تخطر على ذهن المرء.	There are enormous differences among EU members in terms of the size of their public sectors, the flexibility of their labor markets, and almost any socio-economic indicator that one can think of. ProjectSyndicate

Figure 5.7. Another example from the AEPC for the noun difference.

There's a great difference between flexible decision-making and practicing situational ethics	يوجد هناك اختلاف كبير بين صنع قرار مرن وممارسة الأخلاقيات ذات الموقف	**Title:** The 24-Hour Turn-Around More info

5.1.3.2. Punctuation errors

The analysis revealed that students in the EG had far more errors than those made by their peers in the CG. The difference was even seen to be statistically significant. This result entails that while translating with the assistance of the AEPC offered a range of potential benefits for improving translation performance in various aspects, it also led to a significant challenge regarding punctuation precision. What is interesting to note here is that a large proportion of punctuation errors was, in fact, associated with students' tendency to over-punctuate rather than being a direct result of omitting punctuation marks. We assume that this tendency is caused by two different, but related, reasons. First, the use of the AEPC has presumably introduced students to a variety of punctuation marks beyond those with which they were familiar. Such a diversity of punctuation conventions has likely led to a state of uncertainty for most students, realized not only in the wrong choices of punctuation marks but also in the false sense of necessity to incorporate extra punctuation marks in their own translations. Several examples from the AEPC show English renditions having more punctuation marks than their Arabic originals, which is normal since Arabic has no fixed system for punctuation like English has. For instance, Figure 5.8 from the AEPC shows that the Arabic text has only four punctuation marks (three commas and a period), whereas in contrast, its English rendition exhibits a variety of nine punctuation marks.

Second, it is also assumed that the AEPC has exposed students to a wide variety of writing styles through which expert translators exhibited diverse sentence structures, such as complex sentences, appositive phrases, and dependent and independent clauses (see Figure 5.9), all of which necessitated the use of various punctuation conventions. Students may have attempted to replicate such structures and, in so doing, tended to use unwarranted extra punctuation marks.

Figure 5.8. An example from the AEPC for punctations.

If our friend comes closer to us we see his line becomes larger; if he leaves us it becomes smaller: but still he looks like a straight line; be he a Triangle, Square, Pentagon, Hexagon, Circle, what you will - a straight line he looks and nothing else.	وإذا دنا منا صديقنا صار خطه أكبر، وإذا نأى عنا صار أصغر، ولكننا نراه خطاً سواء كان مثلثًا أو مربعًا أو مخمسًا أو مسدسًا أو دائرة أو ما شئت من الأشكال الهندسية، لن يظهر إلا خطاً مستقيمًا.	**Title:** Flatland (A Romance of Many Dimensions) More info

Figure 5.9. Another example from the AEPC for punctations.

وذهب رأي آخر إلى أنه على الرغم من وجود بعض التداخل بين التوصيتين فهناك اختلافات كبيرة بينهما أيضا.	Another view was that, while there was some overlap, there were also significant differences between the two recommendations. UN-2

In addition to errors resulting from over-punctuation, some errors resulted from missing punctuation or incorrect use of punctuation. For instance, TR 15E has punctuation errors resulting from missing commas, whereas TR 10E's errors resulted from a missing period at the end of sentences. Other errors resulted from following the punctuation convention used in the Arabic ST, leading to punctuation errors, such as in TR 16E. Other errors were caused by a wrong choice of the correct punctuation mark, such as in TR 12E.

TR 15E: "[…] was held in Stockholm Sweden."

TR 10E: "[…] perilous due to man's wrongdoing in the environment"

TR 16E: "[…] through the various human activities**...** Thus, we say […]"

TR 12E: "However***;*** the developing countries considered […]"

5.2. Discussion of the Survey Findings

As mentioned in Chapter 3, a close-ended survey was used to examine the participants' attitudes toward the implementation of the AEPC as a main translation and teaching resource. The survey was administered after students completed the final exam. It was adapted from Liu's (2020) and addressed three main themes: 1) students' experience of the parallel corpus, the AEPC; 2) their attitudes toward using the AEPC; and 3) their approach to using the AEPC as a tool to solve translation problems. Using a Likert scale from 1 to 5, students responded to a total of 10 questions. In the analysis of the results, the agreement component (strongly agree and agree) and the disagreement component (strongly disagree and disagree) are grouped together for simplicity and ease of data presentation. For analyzing the Likert scales responses, descriptive statistics were used.

5.2.1. Students' overall experience of the parallel corpus

Three statements assessed students' overall experience of using the AEPC. The first statement pertains to students' viewpoints on the effectiveness of the AEPC, assessing its general capacity as a translation aid. The second statement addresses the usability of the AEPC. Finally, the last statement explores the ability of the AEPC to offer practical solutions for translation problems students encountered while translating. Based on the results in Chapter 4, there is a general positive attitude among the respondents toward the overall experience of using the AEPC as a translation aid. Similar results are also reported in other studies such as, Liu (2020) and Al Anazi (2016) and Alotaibi (2014). As it appears, students likely realized the efficiency of using a parallel corpus as a key resource when completing their translations. The high percentage of

agreement conforms to and supports the advantages of parallel corpora addressed in the literature. As Laviosa and Falco (2023) argue, “the inclusion of corpora and other technological resources in translation education can help students meet their needs, which range from mastering terminology to phraseology, to more complex systems of concepts” (p. 28).

Many respondents found the AEPC convenient to use. This is most likely associated with the fact that the AEPC, as highlighted previously, is web-based and does not require complex configurations to use on a computer or a smartphone. It is easy to access, and the results obtained from queries are user-friendly in the sense that they are neatly organized in colorful boxes and the queried words or phrases are highlighted in all results to make it easier to locate as in Figure 5.10. However, it is assumed that students who expressed that using the corpus was inconvenient had to do with the fact that the second parallel corpus *(http://aeparallelcorpus.com*) has sophisticated search functions and necessitates training prior to its use, as noted in Chapter 3. Despite receiving training prior to and during the experiment, some students likely found it difficult to use. The use of corpora, indeed, requires intensive training and patience until students learn to use them with comfort. The technical issues can sometimes be frustrating to students, eventually leading them to lose interest in using a corpus and ultimately miss the benefits that come with it. Vannestål and Lindquist (2007) pay attention to this matter, arguing:

> introducing the use of corpora to students requires a great deal of time, support, patience, enthusiasm and reflection from the teacher. It is necessary to spend much time together with the students in front of the computers in order to help them get to grips with the corpus work. First, the students need help with purely technical matters (“How do I unblock pop-up windows?”, “Why does the computer tell me that the query syntax is bad?” etc. (p. 344).

Figure 5.10. Example of a query in the AEPC

Moreover, the consensus on viewing the APEC as a viable aid for offering translation solutions could pertain to the fact that the AEPC contains a large repository of attested examples of translation solutions in use and offers multiple options for the searched items. These queried items are embedded in various contexts, allowing students to have a bird's-eye view, so to speak, and, therefore, offering a broader sense and understanding of how they are used according to the context in which they occur. While this is a merit in and of itself, the multiplicity of meaning options can lead to some decision-making difficulties in selecting the correct sense among these options, which possibly explain the disagreement expressed by some students. Vannestål and

Lindquist (2007) illustrate that interpreting what the corpus shows on screen can sometimes be difficult, especially when students lack the capacity for "inductive thinking."

5.2.2. Students' attitudes toward the parallel corpus

As in the first component of the survey, there is also a general tendency toward having positive attitudes when using the AEPC. As seen in Chapter 4, over half of the respondents reported increased confidence in translation when using the parallel corpus. This result is also consistent with other studies, such as Nebot (2008) and Ramos and Moreno (2016). The increased confidence results presumably from the fact that the parallel corpus offers a reliable resource with versatile authentic translations by professionals that students can use to either validate their intuitions or make informed choices when translating by looking for specific information they need. Those who had a contrasting viewpoint were either (1) overwhelmed by the wealth of the corpus results, creating a state of uncertainty and hesitation rather reenforcing confidence, or (2) confused since they probably had certain expectations that were not met by using the corpus, and which were found to likely contradict what they had in mind.

Moreover, the agreement on the efficiency of the AEPC to increase interest in translation is of paramount importance as it is a pedagogical outcome often emphasized in student-centered approaches, leading to more autonomous learning. The same result is also supported in Oțăt's (2019) study, in which she demonstrates that using a parallel corpus for translation opens the door for offering a practical, authentic experience of translation, one that leads to increased interest in and motivation for translation and encourages "lifelong learning" (p. 139).

There may be several reasons for the increase in students' interest in translation, among which are the ease of information retrieval and expanded learning opportunities. Compared to dictionaries, the parallel corpus allows learners to swiftly look for and obtain the information

they need without needing to spend longer time flipping through the dictionary's pages. Such an opportunity, which avails itself merely by a simple click of a mouse, could have likely provided students with a higher sense of translation efficacy, therefore, leading to an increased interest in translation. In the same manner, the wealth of translation examples by experts in the AEPC opens the door for learners to explore almost limitless translations, allowing them to expand their learning opportunities and, in turn, leading them to have a high sense of interest in carrying out translation tasks.

Along the same lines, respondents expressed an enhanced sense of professionalism when translating with the assistance of the AEPC. This is also echoed by other studies, such as Liu (2020) and Jianwen et al. (2023), which advocates for the idea that the integration of corpus tools cultivates a sense of professionalism. The feeling of professionalism is, in a sense, driven by the authenticity of translations in the corpus. Unlike using a dictionary, using the AEPC offers an authentic context in which students have the possibility of exploring how, for instance, certain real translation problems are addressed not only by a single translator but rather by different experts who, in their endeavors, show several solutions to these problems. On this particular case, López-Garcia and Rodríguez-Inés (2019) assert that the use of corpora in translation offers an avenue that helps both trainers and trainees "to deal with various genuine topics and issues stemming from real-life professional needs" (p. 320).

5.2.3. Students' approach toward using the parallel corpus

This component in the survey explored students' responses with respect to the way they used the parallel corpus in their translation. The analysis of the survey indicated that the greater majority of the respondents had a positive inclination toward the AEPC for addressing translation problems at word, phrase, and sentence levels, respectively. These results are

consistent with (1) findings from previous research, showing that the use of parallel corpora in teaching leads to quality improvement at the word level (Varantola, 2003; Giampieri, 2021), the phrase level (Frankenberg-Garcia, 2015), and the sentence level (Moreno, 2016), and (2) findings from this study's analyses that illustrated fewer errors at these levels, respectively. Parallel corpora play a prime role in this vein, offering direct access to enormous, authentic translations by experts and, consequently, allowing students to make informed decisions when translating. Varantola (2003) regards such a corpus type "as performance-enhancing tools in translation or, more precisely, as decision-making tools for lexical and textual knowledge" (p. 59).

However, two inconsistencies were observed from the survey with respect the high percentage of the respondents suggesting that the AEPC helped them improve their proficiency of English grammar. First, this result is inconsistent with some surveys, such as Liu (2020), in which respondents indicated the unlikelihood of a parallel corpus to improve grammatical knowledge and competence. Second, the high percentage does not comply with the results from the statistical analysis of the number of grammatical errors, which showed that students in the EG had more grammatical errors than their peers in the CG, despite being statistically non-significant.

Perhaps, improving grammatical knowledge and competence through using a parallel corpus is not straightforward and requires critical analytical skills to draw generalization about structural patterns seen in the corpus. In fact, Vannestål and Lindquist (2007), in a project geared toward understanding the role of corpora in teaching grammar, note that corpora appear less helpful in advancing students' grammar. After two separate experiments, they concluded that a corpus normally "takes a lot of time and practice for them [students] to understand how they

should think when faced with a concordance list of authentic examples, from which they are supposed to extract rules of language usage" (p. 344). Liu and Jiang (2009) echo this proposition, suggesting that a corpus-based approach to learning grammar can lead to enhancing grammatical awareness but is conditioned on students' inductive abilities "to identify lexicogrammatical usage rules and patterns" (p. 70) from the corpus, which, in their study, appeared to be the greatest challenge students encountered. This may reasonably explain the reasons as to why students in the EG failed to overcome their grammatical deficiencies by using the AEPC.

5.3. General Observations

Here, I would like to present some general observations that I noted while conducting the experiment. These observations are worthy of discussion and consideration for future experimental studies. First, although time was not included as a variable in this study, it was apparent that the use of PCBT had an effect on the time required to complete translation tasks. In this experiment, students in the EG processed their translations faster with the assistance of the AEPC than their peers in the CG, who merely relied on dictionaries.[16] This result is consistent with other studies found in the literature, illustrating that the use of corpora is a key factor in speeding up the translation process while, at the same time, ensuring high quality translation output. Buendía-Castro and López-Rodríguez (2013), for instance, argue that one prominent advantage of corpus-assisted translation is its efficacy in reducing the time needed to complete translation tasks compared to conventional resources like dictionaries. This is echoed by Zanettin (1998), who illustrates that the use of corpora, particularly parallel corpora, is very efficient and helps translators to "retrieve chunks of translated language in order to speed up their work and

[16] Although time was not intended to be examined in this study, such an observation was based on the time logged for each participant's submission. All the participants started at the same time, and the time was tracked from the time they received their translation exam booklets until they submitted their translation.

ensure accurate and consistent translations" (p. 2). Likewise, Bowker and Barlow (2008) and Kornacki (2018) illustrate that using corpus-based translation tools is efficient and assists translators in maintaining a balance between fast delivery of translation tasks and translation quality.

Second, some students in the CG asked for blank paper for drafting. A total of seven drafts were made. The rough drafts were cross-checked against the final versions, and some discrepancies were found in spelling between the rough drafts and final translations in only three student translations. TR 19C, TR 22C, and TR 27C had two, one, and three cases of spelling issues, respectively, in their final versions, which did not occur in their first drafts. While providing variations in spelling is treated as a case of indecision[17] according to the ATA framework, the variant spellings did not occur within the same draft. That is, one form of spelling was offered in the rough draft, the other in the final version. Therefore, my assumption is that these spelling discrepancies occurred as a result of transfer rather than a lack of knowledge. However, in order not to jeopardize the validity of the results, these answers were excluded from the results.

Third, the CG and EG translations were digitized from the original hard copies so that they would be more convenient for the graders to grade. All translations were digitized, except for three translations due to some illegible words, which were then excluded from the results. It is, however, worth noting that, while illegibility does not have a direct relationship to gauging the overall quality of the translations, it does reflect the necessity for the integration of technology in translation classes. This is particularly important for two reasons. First, students in this generation are what Prensky (2001) describes as "digital natives [who] are all 'native

[17]An indecision error occurs when the candidate gives more than one option for a given translation unit. Graders will not choose the right word for the candidate. Even if both options are correct, an error will be marked.

speakers' of the digital language" (p. 1). Using the traditional model of pen(cil) and paper is an anachronism not only for the contemporary reality of the translation industry but also for students themselves. Prensky argues that students in this generation

> represent the first generations to grow up with new technology. They have spent their entire lives surrounded by and using computers, videogames, digital music players, video cams, cell phones, and all the other toys and tools of the digital age. [They, therefore,] think and process information fundamentally differently from their predecessors. These differences go far further and deeper than most educators suspect or realize. (p. 1)

As such, it would appear illogical not to include simple and basic technology like word-processing software for students to work on these translations. Second, allowing students to access such a simple technology does not deny them the opportunity to have their work assessed fairly. As seen from the above three translations excluded due to illegibility, these students might have produced fairly good quality translations yet would have been penalized for each illegible occurrence in any practical exam setting, where illegibility is part of the assessment rubric.

Fourth, during the last week of teaching, some students in the EG made a remark concerning vocabulary expansion. They stated that they learned new vocabulary items as they searched through the AEPC. Although examining such a remark may be worth investigating in a future study, it is worth highlighting that what they reported is, in fact, consistent with research in Second Language Acquisition (SLA), which suggests that reading can lead to incidental learning of novel vocabulary (Pellicer-Sánchez, 2016; Godfroid et al., 2018, Teng, 2019). Incidental learning of new words occurs as a "by-product," to use Schmitt's (2010) term, of an activity not explicitly geared toward learning vocabulary. I believe this result is feasible since access to the AEPC allows students to navigate and read through a plethora of texts, and their

frequent exposures to new words that might have repeatedly appeared in different queries led to this result. What students reported is echoed in Wang and Pellicer-Sánchez's (2022) study, which found that reading bilingual subtitles resulted in vocabulary gains. Bilingual subtitles, offering both the source and the target languages, are fairly similar to the concept of a bilingual corpus, yet with different means of presentation. In Zanettin's (2009) study, *Corpus-based Translation Activities for Language Learners*, he also suggests that "translation plays an important role in lexical acquisition, for instance by focusing on shared cognates, false friends, collocations, and idioms (p. 211). However, more empirical research is required in this area.

5.4. Summary of the Chapter

In this chapter, I presented a detailed interpretation of the results obtained from the translation exams together with data from the survey. I found supporting results for the role PCBT plays in translator education. The incorporation of a parallel corpus paved the way for improving translation quality at different levels, a result that was consistent with other studies in the literature. Improved translation quality was evident in the reduced number of errors across various error subcategories, in comparison to students who utilized traditional resources, such as dictionaries. Nevertheless, it is also important to highlight that over-reliance on the corpus was also associated with an increase in errors in other error subcategories, which calls for further investigation to seek possible solutions that could amend this outcome.

I also found that the use of a parallel corpus in translator education was well-received among the students who used it. The survey showed that a high percentage of students expressed positive attitudes toward the incorporation of a parallel corpus into translator education. They mostly found that translating with the assistance of a parallel corpus was not only convenient and

effective in helping them overcome challenging items, but it was also efficient in increasing their level of confidence, interest in translation, and sense of professionalism.

Finally, as with any empirical endeavor, there are always limitations that may impact the final findings, even partially. The next chapter addresses some of the limitations I encountered. It also discusses some future research directions, which mainly invest in corpus-mediated translation pedagogy. These proposed avenues are potentially the nucleus for more systematic and strategic corpus-based translation teaching, accentuating more learned-centeredness and, at the same time, offering greater opportunities for discovery learning to take place.

CHAPTER 6: CONCLUSION

6.1. A Summary of the Results

This study sought to examine whether the adoption of PCBT has an impact, if any, on translation quality. I found that adopting PCBT does affect the number of errors, as seen in its capacity to mitigate error occurrences in many student translations. In other words, students who translated with the assistance of the parallel corpus made fewer errors than their peers who used conventional resources in several error subcategories, such as spelling, cohesion, literalness, omission, and terminology. Adopting PCBT granted students the opportunity to experiment with the parallel corpus, leverage its wealth of authentic translated texts, and use it to their advantage. PCBT paved the way to more constructive learning, a process that included observation, negotiation, evaluation, and critical thinking.

I also observed that PCBT had an impact on the types of errors in student translations. On the one hand, this approach had a positive effect in regard to mitigating errors of different types in student translations, but on the other hand, I found that it resulted, somewhat paradoxically, in more errors in other error types. Despite the increased number of errors, I would argue that PCBT is still effective for two reasons. First, the increased number of errors was deemed statistically significant only in two error types (addition and punctuation) compared to a statistically significant decrease in other error types. Second, due to time limitations of this study, I suppose that if PCBT were implemented for a longer course of instruction, e.g., three or more semesters, there would be a likelihood of seeing a decrease in these error types.

Finally, the results from the survey revealed that the participants had a general positive attitude toward corpora as a translation aid. Many students reported that incorporating the parallel corpus into their translation workflow was efficient and helpful not only in terms of improving their translations at various linguistic levels but also in terms of their personal attitudes toward translation. They indicated that the use of the parallel corpus led to a stronger level of self-confidence and a higher sense of professionalism during translation. These results underscore the positive role of corpora, lending support to the theoretical propositions made about corpora by a number of researchers (Kruger, 2019; Liu, 2020; Laviosa & Falco, 2021).

With that being said, the results from the translation exams, backed up by the data obtained from the survey, align with the theoretical discussions on the role played by corpora in translator education. This empirical study, while also addressing the need for more empirical research on this topic, offers valuable insights into the use of corpora, particularly parallel corpora, in translator education to aid the learning of novice translators. As Bernardini (2006) argues, "[i]f corpora are to play a role in the translation professions of tomorrow, it is important that they impact on the education of the students of today" (p. 1).

6.2. Significance of the Study

This study contributes to the literature of translator education in three ways. First, based on previous corpus-based translation research, I found a marked scarcity of empirically driven studies that involved the integration of parallel corpora in translator education (Hu, 2016; Liu, 2020; Liu et al., 2023), particularly in the case of Arabic-English translation. Most of the research in this area has been pursued from a descriptive and methodological perspective due to limited, access-free parallel corpora, leading to a dearth of empirical research investigating the actual role of parallel corpora in translator pedagogy.

The current study bridges this gap by responding to the repeated calls for empirical research involving parallel corpora in translator education. Throughout this empirical endeavor, I incorporated a parallel corpus into teaching translation and were able to observe how parallel corpora enhanced the quality of student translations in several ways, such as mitigating learners' language and translation errors, helping novice translators to go a little further beyond the word level as a first step, finding proper terminology, fostering critical thinking, making informed translation decision, and more.

Second, relatively little has been done with respect to English-Arabic translation. Most of the research in this area involved different language pairs, such as such as English-Chinese (Liu, 2020), Italian-English (Zanettin, 2001; Stewart, 2018), Spanish-English (Pearson, 2003; Gallego-Hernández, 2015), and French-English, (Bowker, 2001; Frérot, 2013), leaving another obvious gap to be addressed. The only study on this topic was Alhassan et al. (2021), which had many limitations that might have impacted the final conclusions, as discussed in Chapter One.

The current study addresses this gap by overcoming the limitations of Alhassan et al. (2021). By adhering to a more well-structured methodology, the present study has produced more valid and reliable data. This has allowed to offer more meaningful insights on the role of parallel corpora in translator education while also enhancing the generalizability of the findings to a larger context. Second, the current study offers a deeper understanding of the challenges and opportunities unique to English-Arabic translation and, in so doing, contributes to the linguistic and cultural diversity in the literature of translator education.

Third, several studies alluded to the rigid adherence to teacher-centered education in many Saudi translation departments (Al-Ahdal et al., 2017; Almohaimeed, 2021; Almugharbil, 2021). Such a teacher-centered orientation is characterized by limited learning opportunities

offered to students to construct and guide their own learning. A corpus-based approach, on the contrary, encourages and supports the adoption of a more learner-centered pedagogy by exposing learners to data mining. The participants in the experimental group actively dug into the corpus data, so to speak, and engaged in a series of tasks, such as finding specific information, confirming intuitions, evaluating their own work and that of their peers, as well as observing, critiquing, comparing and contrasting, and analyzing the large chunks of data they retrieved from the parallel corpus, all of which align with the philosophy of learner-centered education.

Another significant contribution is seen in this dissertation's attempt to address the lack of translation technology in most translation programs (Al-Jarf, 2017; Almugharbil, 2021; Altuhaini, 2015; Altuwairesh, 2021) and the current industry needs for tech-savvy translators who are experts in different translation technologies. In this dissertation, I situated the use of electronic corpora as part of the technological sub-competence that is embedded in many translation competence models, alongside other CAT tools, such as termbase management software, text processors, text alignment software, and translation memories. I have argued that integrating parallel corpora into translator education partially compensates for the lack of other technological components by providing students with a minimum level of technological exposure in their translation workflow. As such, it can be seen as an important "baby-step" that facilitates the introduction of more advanced and sophisticated software applications at a later state. This simple, yet effective form of technology offers "a convenient vehicle for introducing digital humanities into the curriculum" (Baer & Mellinger, 2020, p. 2).

6.3. Limitations of the Study

As with all empirical studies, some limitations existed in the experiment. The first limitation is related to this research design. The experiment was initially designed to include both

within-subject and between-subject components. The former design helps measure the same pool of participants and assess their performance before and after exposure to the intervention by means of a pretest and posttest. The latter allows researchers to measure the performance between two different groups of participants. The within-subject design was later excluded for two reasons. First, the pretesting phase, which was scheduled a week prior to the experiment, was not successful. Only 13 participants showed up for the test, and I had to reschedule it for another time during the same week. Second, an electrical power outage occurred during the second attempt, and I had to dismiss all the students. The pretesting phase would have provided valuable information regarding the degree of change in performance among the same participants before and after the application of the intervention, which I could have assessed both quantitatively and qualitatively.

The second limitation relates to directionality. The focus was only on Arabic to English translation to conform with the teaching policy of the English Department at the university under study. L2 translation is a common practice in many translation departments in Saudi Arabia, as discussed above. Thus, I had to sign a consent letter prior to conducting the experiment, emphasizing that no violation of this rule would occur. I believe that it would have been more informative to this line of research if the study had included both Arabic<>English and English>Arabic translation.

The third limitation relates to the limited number of participants in the study. I started with a pool of 47 participants, of whom only 35 were selected for analysis; the rest were excluded from the study as a result of issues that arose during the execution of the experiment. Although the small sample size offered promising insights into the use of parallel corpora in translator education, a larger sample size would have improved the reliability of the experiment

findings since a large sample offers a better representation of the population, a reduced margin of error when analyzing data, and increased confidence in generalizing the results to a broader context.

The fourth limitation belongs to the inadequate participant background. Only male students were included since there were no female students enrolled for the summer semester. This raises the question of whether the results of the study are applicable across genders, as it has been shown that gender may influence language use (Holmes & Meyerhoff, 2003; Mills & Mullany, 2011).

The narrow research context imposes another limitation in this study. The practical constraints involving both time and logistics necessitated that the study be carried out at only one university. Insofar as several universities in Saudi Arabia suffer from similar gaps to those highlighted above, it would have been more desirable to include other universities to see whether the adoption of PCBT would yield similar results in different pedagogical contexts, resulting in more generalizable results.

The final limitation is evident in the low level of collaboration among the translation teachers. Surveying teachers regarding their attitudes toward the implementation of corpora as a translation resource was taken into consideration since such an endeavor would add additional insights regarding the feasibility of corpus-based instruction. However, when the survey was distributed for translation teachers to complete, only six teachers responded, and of the six, only two completed the survey in its entirety. Therefore, the survey was excluded from the study.

6.4. Future Directions

As Laviosa and Falco (2021) argue, “[i]t is fair to say that the use of corpora in translation-oriented language education is still in its infancy” (p. 22), underscoring the need for

more empirical research in this area, involving different language pairs in various pedagogical contexts. That being said, I present here several research directions pertaining to the implementation of corpora in translator education that are worthy of attention. First, since many of the electronic corpora that already exist are mainly textual, I anticipate that multimodal corpora, including interactive images, audios, and videos, constitute the next generation corpus type, which will be included in different pedagogical contexts to teach translation and localization. Such a corpus type has the potential to increase the efficacy of corpus integration in translator education. For instance, the teaching of legal texts involves teaching students to conform to stylistic issues, including formatting. Having hyperlinks that can lead to visual representations of legal contracts in the source and target languages can enhance the authenticity of the tools. In a similar vein, translating cultural and commercial texts often involves rendering non-verbal signs and symbols carrying culture-specific meanings. A multimodal parallel corpus would help overcome the limitations of a textual parallel corpus, encouraging learners to explore how non-verbal signs and symbols are typically rendered in a target culture.

I also anticipate that a combination of corpora and artificial intelligence (AI) will find its way into translation education in order to enhance both quality and productivity. While AI can rapidly generate a range of translations for a ST, it may not capture the subtle nuances, either linguistic or cultural, in the ST, which are often handled by expert translators. Corpora come into play to cope with such deficiencies—a resource that students can use to post-edit the AI-generated output. Another possibility is that teachers can use AI technology to generate translation learning tasks, customizing them according to the learning objectives they intend to achieve. Students, in turn, can be asked to complete those tasks by using corpora.

While many of the current translation tools are geared toward translation as a product, it is also expected to see more process-oriented, corpus-based tools. Such translation tools will have a more interactive, user-friendly interface, with embedded corpora in different languages. These tools will also have the capacity to keep a real-time record of translation as it occurs, with additional information geared toward understanding the translation process, such as screen recording, eye-tracking, and keystroke logging. Researchers can use such information to study a wide range of topics, including, for example, how students actually use corpora for translation, revision, post-editing, and obtaining feedback, as opposed to using traditional tools like dictionaries.

Finally, I also anticipate more research projects geared toward developing corpus-assisted translation curricula and syllabi. Such studies will shed light on how to integrate corpora in translation education at the level of course objectives, course content and modules, teaching methodology, and assessment. I hope that such studies will provide more guidance for integrating corpus technology into teaching translation.

REFERENCES

Abu-Rayyash, H. (2023). Revolutionizing translator training through human-AI collaboration: Insights and implications from integrating GPT-4. *Current Trends in Translation Teaching and Learning E*, *10*, 259-301. https://doi.org/10.51287/cttl20239

Aijmer, A., & Altenberg, B. (1996). *English corpus linguistics*. Routledge. https://doi.org/10.4324/9781315845890

Al Anazi, A. (2016). *Development of translation curricula at undergraduate translation courses in Saudi universities: Exploring student needs and market demands* [Doctoral Dissertation, University of Leicester]. https://leicester.figshare.com/account/articles/10129196

Al-Ahdal, M., Alfallaj, F., Al-Awaid, S., & Al-Mashaqba, N. (2017). Translation courses at Qassim University, Saudi Arabia: A study of existing problems and possible solutions. *US-China Foreign Language*, *15*(3). https://doi.org/10.17265/1539-8080/2017.03.004

Al-Busaidi, S., & Al-Saqqaf, A. H. (2015). English spelling errors made by Arabic-speaking students. *English Language Teaching*, *8*(7), 181-199. https://doi.org/10.5539/elt.v8n7p181

Alenazi, Y. (2022). Implications for language learning, translation, and language teaching. In Y. Alenazi (Ed.), *Exploring lexical inaccuracy in Arabic English translation: Implications and remedies* (pp. 131–157). Springer Nature Singapore. https://doi.org/10.1007/978-981-19-6390-2_6

Alenazi. Y. (2021). *Lexical errors analysis of Saudi university English major students' translation texts*. [Doctoral Dissertation, University of Newcastle] http://hdl.handle.net/1959.13/1429286

Alfayyadh, H. M. (2016). *The feedback culture in translator education: A comparative exploration of two distinct university translation programs* (Publication Number http://orcid.org/0000-0002-

1902-8009) [Doctoral Dissertation, Kent State University]. http://rave.ohiolink.edu/etdc/view?acc_num=kent1460669418

Alhassan, A., Sabtan, Y. M. N., & Omar, L. (2021). Using parallel corpora in the translation classroom: moving towards a corpus-driven pedagogy for Omani translation major students. *Arab World English Journal*, *12*(1), 40-58. https://doi.org/10.24093/awej/vol12no1.4

Al-Jarf, R. (2010). Spelling error corpora in EFL. *Sino-US English Teaching*, *7*(1), 6-15.

Al-Jarf, R. (2017). Technology integration in translator training in Saudi Arabia. *International Journal of Research in Engineering and Social Sciences*, *7*(3), 1-7.

Almahasees, Z. (2021). *Analysing English-Arabic machine translation: Google Translate, Microsoft Translator and Sakhr* (1st ed.). Routledge. https://doi.org/10.4324/9781003191018

Almohaimeed, S. (2021). *The use of self- and peer assessment to enhance learner-centeredness in translator education* (Publication Number http://orcid.org/0000-0003-3463-8988) [Doctoral Dissertation, Kent State University]. http://rave.ohiolink.edu/etdc/view?acc_num=kent1637968219338067

Almugharbil, S. M. (2021). *Producing the translators of tomorrow: Designing a student-centred and competence-based translation curriculum for Saudi universities* [Doctoral Dissertation, University of Wolverhampton]. http://hdl.handle.net/2436/624323

Almujaiwel, S. N. (2012). Contrastive lexicology and comparable English-Arabic corpora-based analysis of vague and mistranslated Arabic equivalence the case of the modern English-Arabic dictionary of Al-Mawrid (Publication Number U616801) [Doctoral Dissertation, University of Exeter].

Aloglah, T. M. A. (2018). Spelling errors among Arab English speakers. *Journal of Language Teaching and Research*, *9*(4), 746-753. https://doi.org/10.2139/ssrn.2818442

alotaibi, H. M. (2014). Teaching CAT tools to translation students: An examination of their expectations and attitudes. *Arab World English Journal*(Special issue), 65-74.

Alotaibi, H. M. (2017). Arabic-English parallel corpus: A new resource for translation training and language teaching. *Arab World English Journal*, *8*(3). https://doi.org/10.24093/awej/vol8no3.21

Alshubaily, S., & BinSultan, N. (2023). Exploring the pedagogical potential of monolingual corpora in inverse translation training. *Arab World English Journal for Translation & Literary Studies 7*(3), 133-151. https://doi.org/10.24093/awejtls/vol7no3.10

Altuhaini, A. S. (2015). Investigating the satisfaction level of Saudi professional translators and translation agencies with the quality of Saudi universities' translator training programmes. In N. Alford & J. Fréchet (Eds.), *Proceedings of the Eighth Saudi Students Conference in the UK* (pp. 731-742). Imperial College Press. https://doi.org/10.1142/9781783269150_0060

Altuwairesh, N. (2021). Translation trainees' uses of and attitudes towards different types of dictionaries: A case study. *International Journal of Applied Linguistics and English Literature*, *10*(2), 8. https://doi.org/10.7575/aiac.ijalel.v.10n.2p.73

Anderson, N. H. (2001*). Empirical direction in design and analysis*. Routledge. https://doi.org/10.4324/9781410600004

Angelelli, C. V. (2009). Using a rubric to assess translation ability: Defining the construct. In C. Angelelli & H. E. Jacobson (Eds.), *Testing and assessment in translation and interpreting studies* (pp. 13-47). John Benjamins. https://doi.org/10.1075/ata.xiv

Araújo, S., & Aguiar, M. M. A. (2023). DIY resources for specialised translation - A three-step multimodal methodology. In O. Ferreiro-Vázquez, A. Pereira, & S. Araújo (Eds.), *Technological innovation put to the service of language learning, translation and interpreting: Insights from academic and professional contexts* (pp. 109-120). Peter Lang.

Aston, G. (1999). Corpus use and learning to translate. *Textus*, *12*, 289-314.

ATA. (2022). *Explanation of error categories*. ATA. Retrieved 08/11/2022 from https://www.atanet.org/certification/how-the-exam-is-graded/error-categories/

Baer, B. J., & Mellinger, C. D. (2020). *Translating texts: An introductory coursebook on translation and text formation* (1. ed.). Routledge. https://doi.org/10.4324/9781315225609

Baker, M. (1993). Corpus linguistics and translation studies: Implications and applications. In M. Baker, G. Francis, & E. Tognini-Bonelli (Eds.), *Text and technology: In honour of John Sinclair* (pp. 233-251). John Benjamins. https://doi.org/10.1075/z.64.15bak

Baker, M. (1995). Corpora in translation studies: an overview and some suggestions for future research. *Target. International Journal of Translation Studies*, *7*(2), 223-243. https://doi.org/10.1075/target.7.2.03bak

Baker, M. (2000). Towards a methodology for investigating the style of a literary translator. *Target. International Journal of Translation Studies*, *12*(2), 241-266. https://doi.org/10.1075/target.12.2.04bak

Baker, M. (2018). *In other words: A coursebook on translation* (3rd ed.). Routledge. https://doi.org/10.4324/9781315619187

Baker, P., & Egbert, J. (2016). Introduction. In P. Baker & J. Egbert (Eds.), *Triangulating methodological approaches in corpus-linguistic research* (pp. 1-19). Routledge. https://doi.org/10.4324/9781315724812-1

Baldwin, L. (2018). Research concepts for the practitioner of educational leadership. Brill

Barik, H. C. (1975). Simultaneous interpretation: Qualitative and linguistic data. *Language and Speech*, *18*(3), 272-297. https://doi.org/10.1177/002383097501800310

Barth, D., & Schnell, S. (2021). *Understanding corpus linguistics*. Routledge. https://doi.org/10.4324/9780429269035

Becher, V. (2011). Explicitation and implicitation in translation A corpus-based study of English-German and German-English translations of business texts [Doctoral Dissertation, University of Hamburg.

Beeby, A., Rodríguez-Inés, P., & Sánchez-Gijón, P. (2009). Introduction. In A. Beeby, P. Rodríguez-Inés, & P. Sánchez-Gijón (Eds.), *Corpus use and translating*. John Benjamins. https://www.jbe-platform.com/content/books/9789027291066-btl.82.02int

Bernardini , S. (2004). Corpus-aided language pedagogy for translator education. In K. Malmkjær (Ed.), *Translation in undergraduate degree programmes* (pp. 97-111). John Benjamins. https://doi.org/10.1075/btl.59.08ber

Bernardini , S., & Castagnoli , S. (2008). Corpora for translator education and translation practice. In E. Yuste Rodrigo (Ed.), *Topics in language resources for translation and localisation* (pp. 39-55). John Benjamins https://doi.org/10.1075/btl.79.04ber

Bernardini, S. (2006, May 22-28). Corpora for translator education and translation practice Achievements and challenges. Third International Workshop on Language Resources for Translation Work, Research & Training, Italy.

Bernardini, S. (2022). How to use corpora for translation. In A. O'Keeffe & M. J. McCarthy (Eds.), *The Routledge handbook of corpus linguistics* (pp. 485-498). Routledge. https://doi.org/10.4324/9780367076399-34

Bernardini, S., & Ferraresi, A. (2022). Corpus linguistics. In F. Zanettin & C. Rundle (Eds.), *The Routledge handbook of translation and methodology* (pp. 207-222). Routledge. https://doi.org/10.4324/9781315158945-16/

Bertaccini, F., & Aston, G. (2001). Going to the Clochemerle: Exploring cultural connotations through ad hoc corpora. In G. Aston (Ed.), *Learning with corpora* (pp. 198-220). CLUEB.

Bowker, L. (1998). Using specialized monolingual native-language corpora as a translation resource: A pilot study. *Meta*, *43*(4), 631-651. https://doi.org/10.7202/002134ar

Bowker, L. (2000). Towards a methodology for exploiting specialized target language corpora as translation resources. *International Journal of Corpus Linguistics*, *5*(1), 17-52. https://doi.org/10.1075/ijcl.5.1.03bow

Bowker, L. (2001). Towards a methodology for a corpus-based approach to translation evaluation. *Meta*, *46*(2), 345–364. https://doi.org/10.7202/002135ar

Bowker, L. (2024). Corpora and translator education. In D. Li & J. Corbett (Eds.), *The Routledge handbook of corpus translation studies*. Routledge. https://doi.org/10.4324/9781003184454-26

Bowker, L., & Barlow, M. (2008). A comparative evaluation of bilingual concordancers and translation memory systems. In E. Yuste Rodrigo (Ed.), *Topics in Language Resources for Translation and Localisation* (pp. 1-22). John Benjamins. https://doi.org/10.1075/btl.79.02bow

Bowker, L., & Bennison, P. (2002). Translation tracking system: A tool for managing translation archives. Proceedings of the Third International Conference on Language Resources and Evaluation, Las Palmas, Canary Islands.

Bowker, L., & Fisher, D. (2010). Computer-aided translation. In Y. Gambier & L. v. Doorslaer (Eds.), *Handbook of translation studies* (pp. 60-65). John Benjamins. https://doi.org/10.1075/hts.1.comp2

Brezina, V. (2018). *Statistics in corpus linguistics: A practical guide*. Cambridge University Press. https://doi.org/10.1017/9781316410899

Buendía-Castro, M., & López-Rodríguez, C. I. (2013). The web for corpus and the web as corpus in translator training. *New voices in translation studies*, *10*(1), 54-71. https://doi.org/10.14456/nvts.2013.24

Cappelle, B., & Loock, R. (2013). Is there interference of usage constraints?: A frequency study of existential there is and its French equivalent il y a in translated vs. non-translated texts. *Target. International Journal of Translation Studies*, *25*(2), 252-275. https://doi.org/10.1075/target.25.2.05cap

Carey, E. G., Ridler, I., Ford, T. J., & Stringaris, A. (2023). Editorial Perspective: When is a 'small effect'actually large and impactful?. *Journal of child psychology and psychiatry*, *64*(11), 1643-1647. https://doi.org/10.1111/jcpp.13817

Carl, M., & Schaeffer, M. J. (2017). Why translation is difficult: A corpus-based study of non-literality in post-editing and from-scratch translation. *Hermes*, *56*, 43-57.

Carney, E. (2006). *A survey of English spelling*. Routledge.

Castagnoli, S. (2016). Investigating trainee translators' contrastive pragmalinguistic competence: a corpus-based analysis of interclausal linkage in learner translations. *The Interpreter and Translator Trainer*, *10*(3), 343-363. https://doi.org/10.1080/1750399X.2016.1236562

Champe, G. (2000). Translationese. In O. Classe (Ed. 1), *Encyclopedia of literary translation into English.* Taylor & Francis.

Chesterman, A. (1997). *Memes of translation: The spread of ideas in translation theory*. John Benjamins. https://doi.org/10.1075/btl.22

Coffey, S. (2002). Using a source language corpus in translator training: A resource for teaching and testing activities. *inTRAlinea*(Special issue). Retrieved 05/12/2023, from https://www.intralinea.org/specials/article/1679

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). L. Erlbaum Associates. Publisher description http://www.loc.gov/catdir/enhancements/fy0731/88012110-d.html

Coleman, R. (2018). *Designing experiments for the social sciences: How to plan, create, and execute research using experiments*. SAGE.

Colina, S. (2009). Further evidence for a functionalist approach to translation quality evaluation. *Target*, *21*(2), 235-264. https://doi.org/10.1075/target.21.2.02col

Cook, V. J. (1997). L2 users and English spelling. *Journal of Multilingual and Multicultural Development*, *18*(6), 474-488. https://doi.org/10.1080/01434639708666335

Cook, V., & Bassetti, B. (2005). An Introduction to researching second language writing systems. In C. Vivian & B. Benedetta (Eds.), *Second language writing systems* (pp. 1-68). Multilingual Matters. https://doi.org/10.21832/9781853597954-003

Dayrell, C. (2007). A quantitative approach to compare collocational patterns in translated and non-translated texts. *International Journal of Corpus Linguistics*, *12*(3), 375-414. https://doi.org/10.1075/ijcl.12.3.04day

Defeng, L. (2016). Translator style: A corpus-assisted approach. In M. Ji, M. Oakes, L. Defeng, & L. Hareide (Eds.), *Corpus methodologies explained: An empirical approach to translation studies* (pp. 103– 136). Routledge.

Dewi, H. D. (2017). Translation and language errors in the Indonesian–English translation. *Journal of World Languages*, *4*(3), 193-217. https://doi.org/10.1080/21698252.2018.1443732

Dimitriu, R. (2004). Omission in translation. *Perspectives*, *12*(3), 163-175. https://doi.org/10.1080/0907676X.2004.9961499

Doyle, M. S. (2003). Translation pedagogy and assessment: Adopting ATA's framework for standard error marking. *The ATA chronicle*, *32*(11), 21-28.

Duběda, T., & Obdržálková, V. (2021). Stylistic competence in L2 translation: stylometry and error analysis. *The Interpreter and Translator Trainer*, *15*(2), 172–186. https://doi.org/10.1080/1750399X.2020.1868175

Duff, A. (1981). The third language: Recurrent problems of translation into English: It ain't what you do, it's the way you do it (1st ed.). Pergamon Press.

Edmonds, W. A., & Kennedy, T. D. (2017). Survey approach. In W. A. Edmonds & T. D. Kennedy (Eds.), *An applied guide to research designs: Quantitative, qualitative, and mixed methods* (2nd edition. ed., pp. 133-139). SAGE. https://doi.org/10.4135/9781071802779

El-Nashar, M. M. (2016). Explicitation techniques in English-Arabic translation: A linguistic corpus-based study. *Arab World English Journal 7*(3), 317-335. https://dx.doi.org/10.24093/awej/vol7no3.23

Engwall, G. (1992). Comments. In S. Jan (Ed.), Directions in corpus linguistics: Proceedings of Nobel symposium 82 Stockholm (pp. 164-169). De Gruyter.

Eskola, S. (2004). Untypical frequencies in translated language: A corpus-based study on a literary corpus of translated and non-translated Finnish. In A. Mauranen & P. Kujamäki (Eds.), Translation universals (pp. 83-99). John Benjamins. https://doi.org/10.1075/btl.48.08esk

Eyckmans, J., & Anckaert, P. (2018). Item-based assessment of translation competence: Chimera of objectivity versus prospect of reliable measurement. *Linguistica Antverpiensia, New Series – Themes in Translation Studies*, *16*(0), 40–56. https://doi.org/10.52034/lanstts.v16i0.436

Fantom, N. J., & Serajuddin, U. (2016). The World Bank's classification of countries by income. *World Bank Policy Research Working Paper*, *7528*, 1–52

Fattah, A. A. (2010). A corpus-based study of conjunctive explicitation in Arabic translated and non-translated texts written by the same translators/authors (Publication Number U513962) [Doctoral Dissertation, The University of Manchester]. ProQuest Dissertations Publishing.

Flowerdew, L. (2013). Corpus-based discourse analysis. In J. P. Gee & M. Handford (Eds.), *The Routledge handbook of discourse analysis* (pp. 174-187). Routledge

Francis, W. N. (1982). Problems of assembling and computerizing large corpora. In S. Johansson (Ed.), *Computer corpora In English language research* (pp. 7-24). Norwegian Computing Centre for the Humanities.

Francis, W. N. (1992). Language Corpora B.C. In S. Jan (Ed.), *Directions in corpus linguistics: Proceedings of Nobel symposium 82 Stockholm* (pp. 17-32). De Gruyter.

Frankenberg-Garcia, A. (2002). COMPARA, language learning and translation training. In B. Maia, J. Haller, & M. Ulyrch (Eds.), *Training the language service provider for the new millennium* (pp. 187-198). Universidade do Porto.

Frankenberg-Garcia, A. (2012). Learners' use of corpus examples. *International Journal of Lexicography*, *25*(3), 273-296. https://doi.org/10.1093/ijl/ecs011

Frankenberg-Garcia, A. (2015). Training translators to use corpora hands-on: challenges and reactions by a group of thirteen students at a UK university. *Corpora*, *10*(3), 351-380. https://doi.org/10.3366/cor.2015.0081

Frérot, C. (2013). Incorporating translation technology in the classroom: Some benefits and issues on using corpora and corpus-based translation tools. In S. V. atherine Way, Reine Meylaerts and Magdalena Bartłomiejczyk (Ed.), *Tracks and Treks in Translation Studies: Selected papers from the EST Congress, Leuven 2010* (pp. 143-166). John Benjamins Publishing Company. https://doi.org/10.1075/btl.108.08fre

Fuster-Márquez, M., Santaemilia, J., Gregori-Signes, C., & Rodríguez-Abruñeiras, P. (2021). Insights from corpus-assisted discourse analysis: Unveiling social attitudes and values. In M. Fuster-Márquez, J. Santaemilia, C. Gregori-Signes, & P. Rodríguez-Abruñeiras (Eds.), *Exploring discourse and ideology through corpora.* (pp. 7-16). Peter Lang

Galal, M. M. (2015). Lost in collocation: When Arabic collocation dictionaries lack collocations. *English language and literature studies*, *5*(2), 18. https://doi.org/10.5539/ells.v5n2p18

Gallego-Hernández, D. (2015). The use of corpora as translation resources: A study based on a survey of Spanish professional translators. *Perspectives*, *23*(3), 375-391. https://doi.org/10.1080/0907676X.2014.964269

George, D., & Mallery, P. (2019). *IBM SPSS statistics 26 step by step: A simple guide and reference*. Routledge.

Giampieri, P. (2021). Volcanic experiences: comparing non-corpus-based translations with corpus-based translations in translation training. *Perspectives*, *29*(1), 46-63. https://doi.org/10.1080/0907676X.2019.1705361

Godfroid, A., Ahn, J., Choi, I. N. A., Ballard, L., Cui, Y., Johnston, S., Lee, S., Sarkar, A., & Yoon, H.-J. (2018). Incidental vocabulary learning in a natural reading context: An eye-tracking study. *Bilingualism: Language and Cognition*, *21*(3), 563-584. https://doi.org/10.1017/S1366728917000219

González Davies, M. (2004). Multiple voices in the translation classroom: activities, tasks, and projects. John Benjamins. http://www.loc.gov/catdir/toc/fy051/2004049729.html

Göpferich, S. (2009). Towards a model of translation competence and its acquisition: the longitudinal study TransComp. In S. J. Göpferich, Arnt Lykke Mees, Inger M (Ed.), *Behind the mind: Methods, models and results in translation process research* (pp. 11-37). Samfundslitteratur.

Göpferich, S. (2013). Translation competence: Explaining development and stagnation from a dynamic systems perspective. *Target. International Journal of Translation Studies*, *25*(1), 61-76. https://doi.org/10.1075/target.25.1.06goe

Gouadec, D. (2007). *Translation as a profession*. John Benjamins. https://doi.org/10.1075/btl.73

Granger, S. (1993). International corpus of learner English. In J. Arts, P. de Haan, & N. Oostdijk (Eds.), *English language corpora: Design, analysis and exploitation* (pp. 57–71). Rodopi. https://doi.org/10.1163/9789004653559_007

Granger, S. (1996). From CA to CIA and back: An integrated approach to computerised bilingual and learner corpora. In A. Aijmer, B. Altenberg, & M. Johansson (Eds.), *Languages in contrast: Papers from a symposium on text-based cross-linguistic studies* (pp. 37-51). Lund University Press.

Granger, S. (2003). Error-tagged learner corpora and call: A promising synergy. *CALICO Journal*, *20*(3), 465-480. http://www.jstor.org/stable/24157525

Granger, S., & Lefer, M. A. (2020). The Multilingual Student Translation corpus: A resource for translation teaching and research. *Language Resources and Evaluation*, *54*(4), 1183-1199. https://doi.org/10.1007/s10579-020-09485-6

Gut, U. (2020). Spoken corpora. In S. T. Gries & M. Paquot (Eds.), *A practical handbook of corpus linguistics* (pp. 235-256). Springer. https://doi.org/10.1007/978-3-030-46216-1_11

Halverson, S. L. (2015). Cognitive translation studies and the merging of empirical paradigms: The case of 'literal translation'. *Translation Spaces*, *4*(2), 310-340. https://doi.org/10.1075/ts.4.2.07hal

Han, C. (2020). Translation quality assessment: A critical methodological review. *The Translator*, *26*(3), 257-273. https://doi.org/10.1080/13556509.2020.1834751

Hansen, G. (2010). Translation 'errors'. In Y. Gambier & L. v. Doorslaer (Eds.), *Handbook of translation studies: Volume 1* (pp. 385–388). John Benjamins. https://doi.org/doi.org/10.1075/hts.1.tra3

Hatim, B., & Munday, J. (2019). *Translation: An advanced resource book for students* (Second edition. ed.). Routledge.

Hoidn, S., & Klemenčič, M. (2021). Introduction and overview. In S. Hoidn & M. Klemenčič (Eds.), *The Routledge international handbook of student-centered learning and teaching in higher education* (1st ed., pp. 1-13). Routledge.

Hoidn, S., & Reusser., K. (2021). Foundations of student-centered learning and teaching. In S. Hoidn & M. Klemenčič (Eds.), *The Routledge international handbook of student-centered learning and teaching in higher education* (1st ed., pp. 17-46). Routledge.

Holmes, J., & Meyerhoff, M. (2003). *The handbook of language and gender*. Blackwell.

Hönig, H. G., & Kussmaul, P. (1982). Strategie der Übersetzung : ein Lehr- und Arbeitsbuch. G. Narr.

Hoover, D. L., Culpeper, J., & O'Halloran, K. (2014). Digital literary studies: Corpus approaches to poetry, prose, and drama. Routledge.

House, J. (1997). Translation quality assessment: A model revisited. Gunter Narr Verlag.

House, J. (2001). Translation quality assessment: Linguistic description versus social evaluation. *Meta*, *46*(2), 243-257. https://doi.org/10.7202/003141ar

House, J. (2015). *Translation quality assessment: Past and present*. Routledge.

Hu, K. (2016). *Introducing corpus-based translation studies* (1st ed.). Springer. https://doi.org/10.1007/978-3-662-48218-6

Humbley, J., Koby, G. S., & Wright, S. A. (1999). English Terminology. In J. Delisle, H. Lee-Jahnke, & M. C. Cormier (Eds.), *Terminologie de la traduction: Translation terminology* (pp. 108-212). John Benjamins. https://doi.org/10.1075/fit.1.03hum

Hunston, S. (2022). How can a corpus be used to explore patterns? In A. O'Keeffe & M. J. McCarthy (Eds.), *The Routledge handbook of corpus linguistics* (pp. 140-154). Routledge. https://doi.org/10.4324/9780367076399-11

Hurtado Albir, A. (2017). *Researching translation competence by PACTE group*. John Benjamins Publishing Company.

Hussain, R. A. M. (2019). An analysis of undergraduate Saudi EFL female students' errors in written English essays. *Arab World English Journal* (Special issue), 241-258. https://doi.org/10.24093/awej/efl1.17

Ilani, A., & Barati, H. (2016). Translations of Journalistic Texts in Iranian Undergraduate Students: an error Analysis approach. *International Journal of English Linguistics*, *6*(6), 147-161.

Jablonkai, R. R., & Csomay, E. (2022). Introduction. In R. R. Jablonkai & E. Csomay (Eds.), *The Routledge handbook of corpora and English language teaching and learning*. Routledge.

James, C. (2013). *Errors in language learning and use: exploring error analysis* (1st ed.). Routledge. https://doi.org/10.4324/9781315842912

James, C., Scholfield, P., Garrett, P., & Griffiths, Y. (1993). Welsh bilinguals' English spelling: An error analysis. *Journal of Multilingual and Multicultural Development*, *14*(4), 287-306. https://doi.org/10.1080/01434632.1993.9994536

Jensen, A. (1999). Time pressure in translation. In G. Hansen (Ed.), *Probing the process in translation: Methods and results* (pp. 103-120). Samfundslitteratur.

Jianwen, L., Yanfang, S., & Kanglong, L. (2023). Corpus-assisted translation learning: Attitudes and perceptions of novice translation students. In M. Kin-wah (Ed.), *Advances in techno-humanities: Case studies from culture, philosophy, and the arts* (pp. 76-92). Routledge.

Karpova, O. M. (1992). Shakespeare lexicography. Trends of development (XVIII-XX cc.). In H. Tommola, K. Varantola, T. Salmi-Tolonen, & J. Schopp (Eds.), *Proceedings of the 5th EURALEX international congress* (pp. 593-600). Tampereen YIiopisto.

Kearns, J. (2006). *Curriculum renewal in translator training: Vocational challenges in academic environments with reference to needs and situation analysis and skills transferability from the contemporary experience of Polish translator training culture* [Doctoral Dissertation, Dublin City University].

Kelly, D. (2005). A handbook for translator trainers: a guide to reflective practice. St Jerome Publishing.

Kennedy, G. (2014). *An introduction to corpus linguistics*. Routledge. https://doi.org/10.4324/9781315843674

Kenny, D. (2001). *Lexis and creativity in translation: A corpus-based study* (1st ed.). Routledge. https://doi.org/10.4324/9781315759968

Kenny, D. (2020). Technology and translator training. In M. O'Hagan (Ed.), *The Routledge handbook of translation and technology* (pp. 498–515). Routledge.

Khatter, S. (2019). An analysis of the most common essay writing errors among EFL Saudi female learners. *Arab World English Journal*, *10*(3). https://doi.org/10.24093/awej/vol10no3.26

Killman, J. (2018). A Context-based approach to introducing translation memory in translator training. In: Godev, C. (eds) *Translation, globalization and translocation. The classroom and beyond*. Palgrave Macmillan. https://doi.org/10.1007/978-3-319-61818-0_8

Kiraly, D. (2012). Growing a project-based translation pedagogy: A fractal perspective. *Meta*, *57*(1), 82-95. https://doi.org/10.7202/1012742ar

Kiraly, D. C. (1995). *Pathways to translation*. Kent State University Press.

Kiraly, D. C. (2000). A social constructivist approach to translator education: Empowerment from theory to practice. St. Jerome.

Kiraly, D. C. (2014). A social constructivist approach to translator education: Empowerment from theory to practice. Routledge.

Kiraly, D. C., & Massey, G. (Eds.). (2019). *Towards authentic experiential learning in translator education* (2nd ed.). Cambridge Scholars.

Klaudy, K. (2003). Languages in translation: Lectures on the theory, teaching and practice of translation. Scholastica.

Koby, G. S. (2015). The ATA flowchart and framework as a differentiated error-marking scale in translation teaching. In Y. Cui & W. Zhao (Eds.), *Handbook of Research on teaching methods in language translation and interpretation* (pp. 220-253). IGI Global. https://doi.org/10.4018/978-1-4666-6615-3.ch013

Koby, G. S., & Baer, B. J. (2003). Task-based instruction and the new technology: Training translators for the modern language industry. In G. S. Koby & B. J. Baer (Eds.), *Beyond the ivory tower: Rethinking translation pedagogy* (pp. 211-227). John Benjamins. https://doi.org/10.1075/ata.xii.15kob

Koby, G. S., & Baer, B. J. (2005). From professional certification to the translator training classroom: Adapting the ATA error marking scale. *Translation Watch Quarterly*, *1*(1), 33-45.

Kornacki, M. (2018). *Computer-assisted translation (CAT) tools in the translator training process* [Doctoral Dissertation, University of Lodz]. http://hdl.handle.net/11089/23214

Kraft, M. A. (2020). Interpreting effect sizes of education interventions. *Educational Researcher*, *49*(4), 241-253. https://doi.org/10.3102/0013189X2091279

Kruger, H. (2019). That again: A multivariate analysis of the factors conditioning syntactic explicitness in translated English. *Across Languages and Cultures*, *20*(1), 1-33. https://doi.org/10.1556/084.001

Krüger, R. (2012). Working with corpora in the translation classroom. *Studies in second language learning and teaching*, *2*(4), 505-525. https://doi.org/10.14746/ssllt.2012.2.4.4

Kübler, N., Mestivier, A., & Pecman, M. (2018). Teaching specialised translation through corpus linguistics: Translation quality assessment and methodology evaluation and enhancement by experimental approach. *Meta*, *63*(3), 807-825. https://doi.org/10.7202/1060174ar

Kučera, H. & Francis, W. N. (1967). *Computational analysis of present-day American English*. Brown University Press.

Kunilovskaya, M., Ilyushchenya, T., Morgoun, N., & Mitkov, R. (2023). Source language difficulties in learner translation: Evidence from an error-annotated corpus. *Target*, *35*(1), 34-62. https://doi.org/10.1075/target.20189.kun

Kunilovskaya, M., Morgoun, N., & Pariy, A. (2018). Learner vs. professional translations into Russian: Lexical profiles. *Translation & Interpreting*, *10*(1), 33-52. https://doi.org/10.12807/ti.110201.2018.a03

Kupsch-Losereit, S. (1985). The problem of translation error evaluation. In C. Tietford & A. E. Hieke (Eds.), *Translation in foreign language teaching and testing* (pp. 169–179.). Gunter Narr.

Kussmaul, P., & Tirkkonen-Condit, S. (1995). Think-Aloud Protocol Analysis in Translation Studies. *Meta*, *8*(1), 177-199. https://doi.org/10.7202/037201ar

Kutuzov, A., & Kunilovskaya, M. (2014). Russian learner translator corpus. In P. Sojka, A. Horák, I. Kopeček, & K. Pala (Eds.), *Text, speech and dialogue* (pp. 315-323). Springer https://doi.org/10.1007/978-3-319-10816-2_39

Laursen, A., & Pellón, I. (2014). Text corpora in translator training. *The Interpreter and Translator Trainer*, *6*(1), 45-70. https://doi.org/10.1080/13556509.2012.10798829

Laviosa, S. (1996). Corpus Linguistics and translation studies. In V. Viana, S. Zyngier, & G. Barnbrook (Eds.), *Perspectives on corpus linguistics* (pp. 131-153). John Benjamins.

Laviosa, S. (1998). The Corpus-based approach: A new paradigm in translation studies. *Meta*, *43*(4), 474-479. https://doi.org/10.7202/003424ar

Laviosa, S. (2004). Corpus-based translation studies: Where does it come from? Where is it going? *Language Matters*, *35*(1), 6-27. https://doi.org/10.1080/10228190408566201

Laviosa, S., & Falco, G. (2021). Using corpora in translation pedagogy. In V. X. Wang, L. Lim, & D. Li (Eds.), *New Perspectives on Corpus Translation Studies* (pp. 3-27). Springer Singapore. https://doi.org/10.1007/978-981-16-4918-9_1

Laviosa, S., & Falco, G. (2023). Corpora and translator education: Past, present, and future. In J. Pan & S. Laviosa (Eds.), *Corpora and translation education. Advances and challenges.* Springer. https://doi.org/10.1007/978-981-99-6589-2_2

Laviosa-Braithwaite, S. (1997). Investigating simplification in an english comparable corpus of newspaper articles. In K. Klaudy & J. Kohn (Eds.), *Transferre Necesse Est* (pp. 531-540). Scholastica.

Liu, D., & Jiang, P. (2009). Using a corpus-based lexicogrammatical approach to grammar instruction in EFL and ESL contexts. *The Modern Language Journal*, *93*(1), 61-78. https://doi.org/10.1111/j.1540-4781.2009.00828.x

Liu, K. (2020). *Corpus-assisted translation teaching: Issues and challenges*. Springer. https://rave.ohiolink.edu/ebooks/ebc2/9789811589959

Liu, K., & Afzaal, M. (2021). Syntactic complexity in translated and non-translated texts: A corpus-based study of simplification. *PLoS One*, *16*(6), e0253454. https://doi.org/10.1371/journal.pone.0253454

Liu, K., Su, Y., & Li, D. (2023). How do students perform and perceive parallel corpus use in translation tasks? Evidence from an experimental study. In J. Pan & S. Laviosa (Eds.), *Corpora and translation education: Advances and challenges* (pp. 135-157). Springer Nature Singapore. https://doi.org/10.1007/978-981-99-6589-2_7

Llach, M. P. A. (2011). *Lexical errors and accuracy in foreign language writing*. Multilingual Matters. https://doi.org/10.21832/9781847694188

López-Garcia, V., & Rodríguez-Inés, P. (2019). Learning corpus linguistics tools and techniques to cope with the current challenges of audiovisual translation. *The Interpreter and Translator Trainer*, *13*(3), 307-325. https://doi.org/10.1080/1750399X.2019.1656409

Lörscher, W. (1996). A Psycholinguistic analysis of translation processes. *Meta*, *41*(1), 26-32. https://doi.org/10.7202/003518ar

Malamatidou, S. (2018). *Corpus triangulation: Combining data and methods in corpus-based translation studies*. Routledge.

Martella, R. C. N., Ron J., & Morgan, R. L. M.-M., Nancy (2013). *Understanding and interpreting educational research*. Guilford Publications.

Mateo, R. M. (2014). A deeper look into metrics for translation quality assessment (TQA): a case study. *Miscelánea: A Journal of English and American Studies*, *49*, 73-94.

Mateo, R., Martínez, S., & Guijarro, A. J. (2016). The modular assessment pack: A new approach to translation quality assessment at the Directorate General for Translation. *Perspectives*, *25*(1), 18-48. https://doi.org/10.1080/0907676X.2016.1167923

Mauranen, A. (2004). Corpora, universals and interference. In A. Mauranen & P. Kujamäki (Eds.), Translation universals (pp. 65-82). John Benjamins. https://doi.org/10.1075/btl.48.08esk

McAlester, G. (2000). The evaluation of tTranslation into a foreign language. In C. Schäffner & B. J. Adab (Eds.), *Developing translation competence* (pp. 229–241). John Benjamins. https://doi.org/10.1075/btl.38.21mca

McEnery, T., & Hardie, A. (2012). *Corpus linguistics: Method, theory and practice*. Cambridge University Press.

McEnery, T., & Wilson, A. (1996). *Corpus linguistics* (1st ed.). Edinburgh University Press.

McEnery, T., & Wilson, A. (2001). *Corpus linguistics* (2nd ed.). Edinburgh University Press.

McEnery, T., & Xiao, R. (2007). Parallel and comparable corpora: What is happening? In A. Gunilla & R. Margaret (Eds.), *Incorporating corpora* (pp. 18-31). Multilingual Matters. https://doi.org/10.21832/9781853599873-005

McLaughlin, M. (2009). The Linguistics of translated texts: the language of translation as the 'Third Code'. *Translation Lunch*. Retrieved 12/10/2022, from https://shorturl.at/cnBU7

Mellinger, C. D., & Hanson, T. A. (2022). Research data. In F. Zanettin & C. Rundle (Eds.), *The Routledge handbook of translation and methodology* (pp. 207-222). Routledge. https://doi.org/10.4324/9781315158945-23

Meyer, C. F. (2002). *English corpus linguistics: An introduction*. Cambridge University Press.

Mikhailov, M., & Cooper, R. (2016). *Corpus linguistics for translation and contrastive studies: A guide for research.* Routledge. https://doi.org/10.4324/9781315624570

Mikhailov, M., & Villikka, M. (2001). Is there such a thing as a translator's style. In P. Rayson, A. Wilson, T. McEnery, A. Hardie, & S. Khoja (Eds.), *Proceedings of Corpus Linguistics 2001 Conference* (pp. 378-385). Lancaster University.

Mills, S., & Mullany, L. (2011). *Language, gender and feminism: Theory, methodology and practice*. Routledge. Contributor biographical information http://www.loc.gov/catdir/enhancements/fy1204/2010049754-b.html

Monzó-Nebot, E. (2024). Corpora and the translation of legal texts. In D. Li & J. Corbett (Eds.), *The Routledge handbook of corpus translation studies*. Routledge. https://doi.org/10.4324/9781003184454-23

Moorkens, J. (2018). What to expect from neural machine translation: A practical in-class translation evaluation exercise. *Interpreter and Translator Trainer*, *12*(4), 375-387. https://doi.org/10.1080/1750399x.2018.1501639

Moorkens, J., Castilho, S., Gaspari, F., & Doherty, S. (2018). *Translation quality assessment: From principles to practice*. Springer.

Moreno, F. J. V. (2016). Teaching the use of ad hoc corpora in the translation of legal texts into the second language. *Language and law/Linguagem e Direito*, *3*(1), 100-119.

Mossop, B. (1989). Objective translational error and the cultural norm of translation. *TTR*, *2*(2), 55-70. https://doi.org/10.7202/037046ar

Mossop, B. (2014). *Revising and editing for translators* (3rd, Ed.). Routledge. https://doi.org/10.4324/9781315767130

Na, P. (2005). *Error analysis in Vietnamese - English translation: Pedagogical implications*. [Doctoral Dissertation, Western Sydney University]. http://handle.uws.edu.au:8081/1959.7/20242

Nebot, E. M. (2008). Corpus-based Activities in Legal Translator Training. *The Interpreter and Translator Trainer*, *2*(2), 221-252. https://doi.org/10.1080/1750399X.2008.10798775

Neshkovska, S. (2019). The role of electronic corpora in translation training. *Studies in Linguistics, Culture, and FLT*, *7*(3), 48-58.

Neubert, A., & Shreve, G. M. (1992). *Translation as text*. Kent State University Press

Newmark, P. (1988). *A textbook of translation*. Prentice-Hall International.

Nisa, S. U., Alhaider, S. M., Usmani, S., Wani, N. H., & Asiri, S. (2023). Errors in writing among female students at the tertiary level in Saudi Arabia. *International Journal of Linguistics, Literature and Translation*, *6*(3), 150-166. https://doi.org/10.32996/ijllt

Nofal, K. H. (2012). Collocations in English and Arabic: A comparative study. *English language and literature studies*, *2*(3), 75. https://doi.org/10.5539/ells.v2n3p75

Nord, C. (2005). Text analysis in translation: Theory, methodology, and didactic application of a model for translation-oriented text analysis (2nd ed.). Rodopi.

Nord, C. (2018). *Translating as a purposeful activity. Functionalist approaches explained (2nd ed.).* St. Jerome. https://doi.org/10.4324/9781351189354

O'Brien, S. (2012). Towards a dynamic quality evaluation model for translation. *The Journal of Specialised Translation*, *17*(1), 55-77.

O'Brien, S., & Vázquez, S. R. (2020). Translation and technology. In S. Laviosa & M. Gonzalez Davies (Eds.), *Routledge Handbook of Translation and Education* (pp. 264-277). Routledge.

O'Keeffe, A., & McCarthy, M. J. (2022). Of what is past, or passing, or to come': corpus linguistics, changes and challenges. In A. M. O'Keeffe, Michael J. (Ed.), *The Routledge handbook of corpus linguistics* (pp. 1-9). Routledge. https://doi.org/10.4324/9780367076399-1

Obrusnik, A. (2023). Data acquisition and other technical challenges in learner corpora and translation learner corpora. In J. Pan & S. Laviosa (Eds.), *Corpora and translation education: Advances and challenges* (pp. 161-169). Springer Nature Singapore. https://doi.org/10.1007/978-981-99-6589-2_8

Olohan, M. (2001). Spelling out the optionals in translation: A corpus study. *UCREL Technical Papers*, *13*, 423-432.

Olohan, M. (2004). *Introducing corpora in translation studies*. Routledge. http://www.loc.gov/catdir/toc/ecip0413/2004001381.html

Oțăt, D. (2018). Working with bilingual corpora to enhance legal translation competence. *Romanian Journal of English Studies*, *15*(1), 134-144. https://doi.org/10.1515/rjes-2018-0018

PACTE. (2003). Building a translation competence model. In F. Alves (Ed.), *Triangulating translation: Perspectives in process oriented research* (pp. 43–66). John Benjamins. https://doi.org/10.1075/btl.45.06pac

PACTE. (2011). Results of the validation of the PACTE translation competence model Translation problems and translation competence. In C. Alvstad, A. Hild, & E. Tiselius (Eds.), *Methods and*

Strategies of Process Research: Integrative Approaches in Translation Studies (Vol. 94, pp. 317-343). https://doi.org/10.1075/btl.94.22pac

PACTE. (2017). Data collection and analysis. In A. Hurtado Albir (Ed.), *Researching translation competence by PACTE group* (pp. 107-116). John Benjamins https://doi.org/10.1075/btl.127.07pac

Pataki, K. W., Metz, A. E., & Pakulski, L. (2014). The effect of thematically related play on engagement in storybook reading in children with hearing loss. *Journal of Early Childhood Literacy*, *14*(2), 240-264. https://doi.org/10.1177/1468798413480516

Pearson, J. (1996). Electronic texts and concordances in the translation classroom. *TEANGA: The Irish Yearbook of Applied Linguistics;*(16), 85-95.

Pearson, J. (2003). Using parallel texts in the translator training environment. In F. Zanettin, S. Bernardini, & D. Stewart (Eds.), *Corpora in translator education* (pp. 15-24). Routledge.

Pellicer-Sánchez, A. (2016). Incidental L2 vocabulary acquisition from and while reading: An eye-tracking study. *Studies in Second Language Acquisition*, *38*(1), 97-130. https://doi.org/10.1017/S0272263115000224

Piróth, A. (2016). Translation into a non-native language–IAPTI's survey. *Rivista internazionale di tecnica della traduzione*, *18*, 15-29. https://doi.org/10.13137/2421-6763/13663

Plonsky, L., & Oswald, F. L. (2014). How big is 'big'? Interpreting effect sizes in L2 research. *Language Learning*, *64*(4), 878-912. https://doi.org/10.1111/lang.12079

Pokorn, N. K. (2005). *Challenging the traditional axioms: Translation into a non-mother tongue*. John Benjamins. https://doi.org/10.1075/btl.62

Prensky, M. (2001). Digital natives, digital immigrants part 2: Do they really think differently? *On the horizon*, *9*(6), 1-6.

Prentice, D. A., & Miller, D. T. (2016). When small effects are impressive. In A. E. Kazdin (Ed.), *Methodological issues and strategies in clinical research* (pp. 99-105). American Psychological Association. https://doi.org/10.1037/14805-006

Pym, A. (1992). Translation error analysis and the interface with language teaching. In C. Dollerup & A. Loddegaard (Eds.), *Teaching translation and interpreting: Training talent and experience.* (pp. 279-288). John Benjamins. https://doi.org/10.1075/z.56

Pym, A. (2001). Trial, error and experimentation in the training of translation teachers. In S. T. Elena & D. F. Oscar (Eds.), *Traducción & comunicación* (2 ed., pp. 73–90). Universidade de Vigo.

Pym, A. (2008). On Toury's laws of how translators translate. In A. Pym, M. Shlesinger & D. Simeoni (Ed.), *Beyond descriptive translation studies: Investigations in homage to Gideon Toury* (pp. 311-328). John Benjamins. https://doi.org/10.1075/btl.75.24pym

Pym, A. (2012). Training translators. In K. Malmkjær & K. Windle (Eds.), *The Oxford handbook of translation studies* Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199239306.013.0032

Qasem, F. (2020). Crosslinguistic influence of the first language: Interlingual errors in the writing of ESL Saudi learners. *Macrolinguistics*, *8*, 105-120.

Ramón, N. (2015). Comparing original and translated Spanish: A corpus-based analysis of adjective position. *Babel-Revue Internationale De La Traduction-International Journal of Translation*, *61*(4), 527-551. https://doi.org/10.1075/babel.61.4.05ram

Ramos, M. D. S., & Moreno, F. J. V. (2016). Using monolingual virtual corpora in public service legal translator training. In E. MartinMonje, I. Elorza, & B. G. Riaza (Eds.), *Technology-enhanced language learning for specialized domains: Practical applications and mobility* (pp. 228-239). Routledge.

Reiss, K., & Vermeer, H. J. (2013). Towards a general theory of translational action: Skopos theory explained (C. Nord, Trans.). St Jerome.

Rico, C. (2017). The ePortfolio: constructing learning in translation technology. *Interpreter and Translator Trainer*, *11*(1), 79-95. https://doi.org/10.1080/1750399x.2017.1306995

Rodríguez-Castro, M. (2018). An integrated curricular design for computer-assisted translation tools: developing technical expertise. *Interpreter and Translator Trainer*, *12*(4), 355-374. https://doi.org/10.1080/1750399x.2018.1502007

Saldanha, G. (2011). Translator Style. *The Translator*, *17*(1), 25-50. https://doi.org/10.1080/13556509.2011.10799478

Saldanha, G., & O'Brien, S. (2013). *Research methodologies in translation studies*. Routledge.

Salkie, R. (2002). Two types of translation equivalence. In B. altenberg & S. Granger (Eds.), *Lexis in contrast: Corpus-based approaches*. John Benjamins. https://doi.org/10.1075/scl.7.06sal

Saville, D. J. (1990). Multiple comparison procedures: The practical solution. *The American Statistician*, *44*(2), 174–180. https://doi.org/10.2307/2684163

Schaeffer, M. (2013). The ideal literal translation hypothesis: The role of shared representations during translation [Doctoral Dissertation, University of Leicester].

Schell, S. (2012). Student-centered university learning: turning traditional education models upside down. *ReVista: Harvard Review of Latin America*, 20-23.

Schmitt, N. (2010). *Researching vocabulary: A vocabulary research manual*. Springer. https://doi.org/10.1057/9780230293977

Selinker, L. (1972). Interlanguage. *International Review of Applied Linguistics in Language Teaching*, *10*(1-4), 209-232. https://doi.org/10.1515/iral.1972.10.1-4.209

Shreve, G. M. (2006). The deliberate practice: Translation and expertise. *Journal of translation studies*, *9*(1), 27-42.

Shreve, G. M., & Angelone, E. (2010). Translation and cognition: Recent developments. In G. M. Shreve & E. Angelone (Eds.), *Translation and cognition*. John Benjamins. https://doi.org/10.1075/ata.xv.01shr

Sinclair, J. (1991). *Corpus, concordance, collocation*. Oxford University Press.

Sinclair, J. (2001). Preface. In M. Ghadessy, A. Henry and R. L. Roseberry (eds.), *Small corpus studies and ELT: Theory and practice*, (pp. vii-xv). John Benjamins.

Sinclair, J. (2005). Corpus and text: Basic principle. In M. Wynne (Ed.), *Developing linguistic corpora: A guide to good practice* (pp. 1-16). Oxbow Books.

Sofer, M. (2013). *The translator's handbook* (8th rev. edition. ed.). Schreiber Publishing.

Soltani, F., Nemati, A., & Yamini, M. (2020). An analysis of translation errors in 5 literary genres based on American Translation Association (ATA) framework. *Cogent Arts & Humanities*, *7*(1). https://doi.org/10.1080/23311983.2020.1799732

Stewart, D. (2000). Conventionality, creativity and translated text: The implications of electronic corpora in translation. In M. Olohan (Ed.), *Intercultural faultlines: Research models in translation studies: v. 1: Textual and cognitive aspects* (pp. 73-91). St. Jerome Publishing.

Stewart, D. (2009). Safeguarding the lexicogrammatical environment Translating semantic prosody. In A. Beeby, P. R. Ines, & P. SanchezGijon (Eds.), *Corpus use and translating: Corpus use for learning to translate and learning corpus use to translate* (Vol. 82, pp. 29-46).

Stewart, D. (2018). Italian to English translation with Sketch Engine: A guide to the translation of tourist texts. Trento Tangram Edizioni Scientifiche.

Stewart, D., Bernardini, S., & Aston, G. (2004). Introduction. In G. Aston, S. Bernardini, & D. Stewart (Eds.), *Corpora and language learners* (pp. 1-18). John Benjamins. https://doi.org/10.1075/scl.17.01ste

Streiner, D. L. (2015). Best (but oft-forgotten) practices: the multiple problems of multiplicity-whether and how to correct for many statistical tests. *The American Journal of Clinical Nutrition*, *102*(4), 721–728. https://doi.org/10.3945/ajcn.115.113548

Sullivan, G. M., & Feinn, R. (2012). Using effect size-or why the P value is not enough. *J Grad Med Educ*, *4*(3), 279-282. https://doi.org/10.4300/jgme-d-12-00156.1

Tekwa, K. (2024). Artificial Intelligence, corpora, and translation studies. In D. C. Li, John (Ed.), *The Routledge Handbook of Corpus Translation Studies* (pp. 103-118). Routledge. https://doi.org/10.4324/9781003184454-8

Teng, F. (2019). The effects of context and word exposure frequency on incidental vocabulary acquisition and retention through reading. *The Language Learning Journal*, *47*(2), 145-158. https://doi.org/10.1080/09571736.2016.1244217

Teubert, W. (2005). My version of corpus linguistics. *International Journal of Corpus Linguistics*, *10*(1), 1-13. https://doi.org/10.1075/ijcl.10.1.01teu

Tian, L. (2020). Application of parallel corpus to teaching style and translation. In: E. Popescu, T. Hao, TC. Hsu, H. Xie, M. Temperini, W. Chen, (eds) *Emerging technologies for education*. SETE 2019. Lecture Notes in Computer Science, vol 11984. Springer. https://doi.org/10.1007/978-3-030-38778-5_26

Tirkkonen-Condit, S. (2005). The Monitor model revisited: Evidence from process research. *Meta*, *50*(2), 405-414. https://doi.org/10.7202/010990ar

Tognini-Bonelli, E. (2001). *Corpus linguistics at work*. John Benjamins. https://doi.org/10.1075/scl.6

Tsai, P. S. (2023). An error analysis on tense and aspect shifts in students' Chinese-English translation. *Sage Open*, *13*(1). https://doi.org/10.1177/21582440231158263

Vannestål, M. E., & Lindquist, H. (2007). Learning English grammar with a corpus: Experimenting with concordancing in a university grammar course. *ReCALL*, *19*(3), 329-350. https://doi.org/10.1017/S0958344007000638

Varantola, K. (2003). Translators and disposable corpora. In F. Zanettin, S. Bernardini, & D. Stewart (Eds.), *Corpora in translator education* (pp. 55-70). Routledge. https://doi.org/10.4324/9781315760162

Varantola, K. (2003). Translators and disposable corpora. In F. Zanettin, S. Bernardini, & D. Stewart (Eds.), *Corpora in translator education* (pp. 55–70). Routledge.

Vigier-Moreno, F. J. (2019). Corpus-assisted translation of specialised texts into the L2. From the classroom to professional practice. *trans-kom,*, *12*, 90-106.

Vinay, J. P., & Darbelnet, J. (1995). *Comparative stylistics of French and English: A methodology for translation* (J. C. Sager & M.-J. Hamel, Trans.). John Benjamins. https://doi.org/10.1075/btl.11

Vintar, S. (2008). Corpora in translator training and practice: A Slovene perspective. In G. Anderman & M. Rogers (Eds.), *Incorporating corpora: The linguist and the translator* (pp. 153-167). Multilingual Matters. https://doi.org/10.21832/9781853599873-012

Wang, A., & Pellicer-Sánchez, A. (2022). Incidental vocabulary learning from bilingual subtitled viewing: An eye-tracking study. *Language Learning*, *72*(3), 765-805. https://doi.org/10.1111/lang.12495

Wang, Z. L., Liu, K. L., & Moratto, R. (2023). A corpus-based study of syntactic complexity of translated and non-translated chairman's statements. *Translation & Interpreting-the International Journal of Translation and Interpreting*, *15*(1), 135-151. https://doi.org/10.12807/ti.115201.2023.a07

Washbourne, K. (2019). Training and education, theory and practice. In M. Baker & G. Saldanha (Eds.), *The Routledge encyclopedia of translation studies* (3rd ed., pp. 597-602). Routledge https://doi.org/doi/10.4324/9781315678627-127

Wilkinson, M. (2005). Using a specialized corpus to improve translation quality. *Translation Journal 9*(3). Retrieved August 18, 2022, from https://translationjournal.net/journal/33corpus.htm

Williams, I. A. (2007). A corpus-based study of the verb observar in English-Spanish translations of biomedical research articles. *Target*, *19*(1), 85–103. https://doi.org/10.1075/target.19.1.06wil

Williams, M. (2013). A holistic-componential model for assessing translation student performance and competency. *Mutatis Mutandis: Revista Latinoamericana de Traducción*, *6*(2), 419-443.

Xiao, R. (2010). How different is translated Chinese from native Chinese? A corpus-based study of translation universals. *International Journal of Corpus Linguistics*, *15*(1), 5-35. https://doi.org/10.1075/ijcl.15.1.01xia

Xiao, R., & Dai, G. (2014). Lexical and grammatical properties of Translational Chinese: Translation universal hypotheses reevaluated from the Chinese perspective. *10*(1), 11-55. https://doi.org/10.1515/cllt-2013-0016

Yamada, M. (2020). Language learners and non-professional translators as users. In M. Ohagan (Ed.), *The Routledge handbook of translation and technology* (pp. 183-199). Routledge.

Zanettin, F. (1998). Bilingual comparable corpora and the training of translators. *Meta*, *43*(4), 616-630. https://doi.org/10.7202/004638ar

Zanettin, F. (2000). DIY corpora. The WWW and the translator. In B. Maia, J. Haller, & M. Urlrych (Eds.), *Training the language services provider for the new millennium* (pp. 239-248). Universidade do Porto.

Zanettin, F. (2001). Swimming in words: Corpora, translation, and language learning. In G. Aston (Ed.), *Learning with corpora* (pp. 177-197). CLUEB. http://www.loc.gov/catdir/toc/fy0714/2002450025.html

Zanettin, F. (2002). Corpora in translation practice. *Language Resources for Translation Work and Research*, 10-14. Retrieved 03/06/2023, from https://shorturl.at/astwC

Zanettin, F. (2009). Corpus-based translation activities for language Learners. *The Interpreter and Translator Trainer*, *3*(2), 209-224. https://doi.org/10.1080/1750399X.2009.10798789

Zanettin, F. (2014). *Translation-driven corpora corpus resources for descriptive and applied translation studies*. Routledge. https://doi.org/10.4324/9781315759661

Zeitoun, S., & Dakik, D. (2018). Using a monolingual textual English corpus in translation. *Arab World English Journal for Translation & Literary Studies*, *2*(3), 100-123. https://doi.org/10.24093/awejtls/vol2no4.7

APPENDICES

APPENDIX A

04-16-2022

Dear participants

I am writing to let you know about an opportunity to participate in a voluntary research study about *Corpora in Translation Teaching.* This study is being conducted by *Mohammed Al Ramadhan*, a PhD candidate at Kent State University.

If you agree, your participation includes attending classes on a regular basis as any other regular course, participating in class, and taking quizzes and assignments. The study is anticipated to take no more than the summer semester, an 8-week period.

If you would like additional information about this study, you may contact me at (malramad@kent.edu) or my advisor, Dr. Brian Baer, at (bbaer@kent.edu).

Thank you for your consideration, and once again, please do not hesitate to contact us if you are interested in learning more about this Institutional Review Board approved project.

Mohammed H. Alramadhan
Department of Modern and Classical Language Studies
Kent State University

APPENDIX B

Consent to Participate in a Research Study
(Control Group)

Study Title: Corpus-driven Translation Pedagogy: An Empirical Study

You are being invited to participate in a research study. This consent form will provide you with information on the research project, what you will need to do, and the associated risks and benefits of the research. Your participation is voluntary. Please read this form carefully. It is important that you ask questions and fully understand the research in order to make an informed decision.

Purpose
Use of parallel corpus in translation training is being investigated in this work. However, no treatment will apply to your section. You will receive regular instruction as usual. The study's findings will be incorporated into the researcher's PhD dissertation.

Procedures
Three main phases will take place in this dissertation. The first phase is dedicated to measuring your level of proficiency in translation through a pretest. The pretest will be administered at the beginning of the semester and will include two short texts to translate, from English to Arabic and vice versa. Both texts will be general, non-specialized ones.

The second phase will involve teaching this course according to the suggested syllabus by the English Department. Because this is a required translation course as part of your academic plan, you are expected to attend sessions on a regular basis and complete your assignments on time. All assignments will be graded by the researcher and returned with feedback.

The last phase will involve testing. All students will take a final exam as part of the requirements of course completion.

Benefits
Your role will not be different from any other class. By taking part in this study, you are expected to see progress in your translation skills. You will learn about translation, hone your translation skills in a professional manner and gain experience that makes you stand in the market.

Risks and Discomforts
There are no risks associated with this study. You may only feel a little challenged by the in-class exercises and assignments that are required on a weekly basis.

Confidentiality
We will keep your information confidential within the limits of the law, but due to the nature of the internet there is a chance that someone could access information that may identify you without permission.

Future Research
Your de-identified information will not be used or shared with other researchers.

Compensation
Not applicable

Voluntary
Participation in this study is voluntary. You may discontinue participation at any time without penalty or loss of benefits.

If you have any questions or concerns about this research, you may contact (Dr. Brian Baer) at (bbaer@kent.edu). This project has been approved by the Kent State University Institutional Review Board. If you have any questions about your rights as a research participant or complaints about the research, you may call the IRB at 330-672-2704.

APPENDIX C

Consent to Participate in a Research Study
(Treatment Group)

Study Title: Corpus-driven Translation Pedagogy: An Empirical Study

You are being invited to participate in a research study. This consent form will provide you with information on the research project, what you will need to do, and the associated risks and benefits of the research. Your participation is voluntary. Please read this form carefully. It is important that you ask questions and fully understand the research in order to make an informed decision.

Purpose
Use of parallel corpus in translation training is being investigated in this work. We want to see if corpus utilization can help improve the abilities of aspiring translators like you. The study's findings will be incorporated into the researcher's PhD dissertation.

Procedures
Three main phases will take place in this dissertation. The first phase is dedicated to measuring your level of proficiency in translation through a pretest. The pretest will be administered at the beginning of the semester and will include two short texts to translate, from English to Arabic and vice versa. Both texts will be general, non-specialized ones.

The second phase will involve teaching this course with the aid of a digital corpora and a translation memory software. Because this is a required translation course as part of your academic plan, you are expected to attend sessions on a regular basis and complete your assignments on time. All assignments will be graded by the researcher and returned with feedback.

The last phase will involve testing. All students will take a final exam as part of the requirements of course completion.

Benefits
By taking part in this study, you are expected to see clear progress in your translation skills. You will learn how to hone your translation skills in a professional manner and gain experience that makes you stand in the market. You will learn how to use certain tools that expert translators use in the industry. Familiarity with these tools can distinguish you from others who are less familiar with them.

Risks and Discomforts
There are no risks associated with this study. You may only feel a little challenged with using the digital corpora and the translation software at the beginning if you are not familiar with using computers.

Confidentiality
We will keep your information confidential within the limits of the law, but due to the nature of the internet there is a chance that someone could access information that may identify you without permission.
Future Research
Your de-identified information will not be used or shared with other researchers.

Compensation
Not applicable

Voluntary
Participation in this study is voluntary. You may discontinue participation at any time without penalty or loss of benefits.

If you have any questions or concerns about this research, you may contact (Dr. Brian Baer) at (bbaer@kent.edu). This project has been approved by the Kent State University Institutional Review Board. If you have any questions about your rights as a research participant or complaints about the research, you may call the IRB at 330-672-2704.

To participate click the button below. If you do not want to participate, exit the window.

APPENDIX D

Adapted ATA Framework for Grading

CODE	ERROR DESCRIPTION	# ERRORS
Target Language Mechanics		
G	Grammar	
SYN	--Syntax	
WF	--Word form	
SP	Spelling	
C	--Case (upper/lower)	
P	Punctation	
Meaning Transfer		
UNF	Unfinished passage	
A	Addition	
AMB	Ambiguity	
COH	Cohesion	
F	Faithfulness (translation strays too far from ST meaning)	
L	Literalness	
MU	Misunderstanding of the ST	
O	Omission	
T	Terminology	
VF	Verb form	
IND	Indecision	
Writing Ability		
U	Usage	
R	Register	
ST	Style	
TOTAL		

APPENDIX E

Source Text

البيئة

البيئة لفظة شائعة الاستخدام ويرتبط مدلولها بنمط العلاقة بينها وبين مستخدمها. فالبيت بيئة والمدرسة بيئة والحي بيئة والكرة الأرضية بيئة والكون كله بيئة. يمكن أن ننظر إلى البيئة من خلال النشاطات البشرية المختلفة.. فنقول البيئة الزراعية والبيئة الصناعية والبيئة الثقافية والبيئة الصحية وهناك أيضا البيئة الاجتماعية والبيئة الروحية والبيئة السياسية.. من ذلك يظهر أن وضع تعريف شامل للبيئة يستوعب مجالات استخدامها المختلفة لا يتيسر بسهولة ويتطلب أن نلم بإطار كل من هذه المجلات.

انعقد في عام ١٩٧٢ بمدينة ستوكهولم، عاصمة السويد، مؤتمر الأمم المتحدة للبيئة البشرية. اختلفت وجهات النظر بين الدول الصناعية والدول النامية حول النهج البشري الواجب اتباعه في البيئة، فقد رأت الدول الصناعية ضرورة أن تبقى الدول النامية دون خطط تصنيع لأن ذلك يؤدي إلى تلويث البيئة مما ينتج عنه مضاعفات وأضرار في مجالات عيش الإنسان المختلفة. واستشهدت هذه الدول بما تعانيه من مشكلات التلوث اقتصاديا صحيا واجتماعيا... إلا أن الدول النامية اعتبرت هذا «الصراخ» بأهوال التلوث لا مبرر له ما دام الناس في الدول الصناعية يتمتعون بمستوى معيشة مرتفع... وتحمس البعض من أفريقيا وأمريكا اللاتينية وارتفع صوتهم بالقول «مرحبا بالتلوث» الذي يرفع من مستوى معيشة أبناء مجتمعاتنا.

وعلى الرغم من اختلاف وجهتي النظر فيما يتعلق بأسلوب التعامل مع البيئة، إلا إن الذين اجتمعوا في ستوكهولم في أكتوبر من عام ١٩٧٢ تحت مظلة الأمم المتحدة أظهروا وعيا بأن مستقبل التنمية بل وربما بقاء الجنس البشري أصبح محفوفا بأخطار متزايدة بسبب تصرفات الإنسان الخاطئة في البيئة.