HACETTEPE ÜNİVERSİTESİ
EĞİTİM BİLİMLERİ ENSTİTÜSÜ

Department of Foreign Language Education
English Language Teaching Program

TEACHING COLLOCATIONS THROUGH DATA-DRIVEN LEARNING: COMPARISON OF TWO APPROACHES

Sevcan BAYRAKTAR ÇEPNİ

Ph.D. Dissertation

Ankara, (2020)

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EŞDİZİMLİLİKLERİN VERİ YÖNLENDİRME ÖĞRENME YAKLAŞIMI İLE ÖĞRETİLMESİ : İKİ YÖNTEMİN KARŞILAŞTIRILMASI

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Ph.D. Dissertation

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Acceptance and Approval

To the Graduate School of Educational Sciences,

This dissertation prepared by **SEVCAN BAYRAKTAR ÇEPNİ** and entitled "Teaching Collocations through Data-Driven Learning: Comparison of two Approaches" has been approved as a thesis for the Degree of **Ph.D.** in the **Program of English Language Teaching** in the **Department of Foreign Language Education** by the members of the Examining Committee.

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This is to certify that this dissertation has been approved by the aforementioned examining committee members on 24/12/2020 in accordance with the relevant articles of the Rules and Regulations of Hacettepe University Graduate School of Educational Sciences and was accepted as a **Ph.D. Dissertation** in the **Program of** English Language Teaching by the Board of Directors of the Graduate School of Educational Sciences from ...../...../.....

Prof. Dr. Selahattin GELBAL
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Abstract

The present study aimed to investigate the effects of two data-driven collocation learning approaches (Corpus Consultancy and Practice on English-Turkish Parallel Texts) on participants' receptive and productive collocational knowledge of form, use and meaning. The study employed a quantitative research design; the data were collected through a vocabulary size test, a vocabulary knowledge scale, and a receptive and productive knowledge tests with a total number of 43 participants (N 14 in the Web-based group, N 16 in the Parallel Texts Group, and N 13 in the Control group). The Corpus Group received training on using a corpus to find and induce the meaning of the target collocations (10 adjective-noun and 10 verb-noun) through the COCA corpus. On the other hand, the Parallel Texts Group studied a small corpus consisting of English extracts containing target collocations taken from COCA corpus side by side with their L1 translations. The Control group, however, was expected to find the meanings of the collocations by resorting online dictionaries. The perceptions of the participants on both experimental approaches were also elicited via a structured survey consisting of open-ended questions. The results showed that The Corpus Group outperformed the Control Group both in both receptive and productive tests, while the Parallel Texts Group's scores remained to be in between in most cases. The participants in the Corpus Group and the Parallel Texts Group shared their perceived benefits and drawbacks of the approaches.

Keywords: data-driven learning, corpus, concordance lines, collocation, parallel texts, vocabulary learning.

Öz

Bu çalışma, iki veriye dayalı eşdizimlilik öğrenme yaklaşımının (Derlem Danışmanlığı ve İngilizce-Türkçe Paralel Metinler Üzerine Uygulama) katılımcıların algısal ve üretimsel biçim, kullanım ve anlam odaklı eşdizimlilik bilgilerinin üzerindeki etkilerini araştırmayı amaçlamaktadır. Bu amaca ulaşmak için, veriler çoğunlukla nicel bir araştırma deseni içinde, Kelime Bilgisi Gelişimi Ölçeği, Algısal Kelime Bilgisi Testi, üretimsel ve algısal eşdizimlilik testleri ile toplanmıştır. Çalışma toplamda 43 katılımcı ile gerçekleşitirilmiştir. Bu katılımcılar, 14 kişi derlem danışmanlığı, 16 kişi parallel metinler ve 13 kişi kontrol gurupta olmak üzere üç ayrı gurup şeklinde çalışmada yer almıştır. Derlem Gurubu COCA derlemini kullanarak, Paralel Metinler Gurubu tüm metinleri COCA derlimden alınıp, Türkçe karşılıkları ile yanyana yazılarak olşuturulan iki dilli küçük bir derlem üzerinde çalışma yaparak ve Kontrol Gurup ise çevrimiçi sözlük kullanarak 20 hedef (10 sıfat-isim, 10 eylem-isim) eşdizimlilikleri öğrenmeye çalışmışlardır. Ayrıca çalışmanın nitel verisi deneysel guruplardaki katılımcıların görüşleri yapılandırılmış açık uçlu soruları ile toplanmıştır. Sonuçları, Kontrol Gurubun algısal ve üretimsel eşdizimlilik başarısının Derlem Gurubununkinden çok daha az olduğunu, Paralel Metinler Gurubunun başarısının Derlem Gurubundan daha az ama Kontrol Guruptan daha çok olduğunu göstermiştir. Derlem Gurubu katılımcıları ve Paralel Metinler Gurubu katılımcıları kullandıkları yöntemlerle ilgili gördükleri avantajları ve dezavantajları paylaşmışlardır.

Anahtar sözcükler: veri yönelndirmeli öğrenme, derlem, bağlamlı dizin, eşdizimlilik, paralel metinler, çevrimiçi, sözlük.

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weak, my calm when I am angry and my sane when I am crazy. I am privileged to have him beside me all through my doctoral education, both as a husband and as a skilled academician. I also dedicate this dissertation to my daughters, Bilge and Işıl ÇEPNİ, who made me stronger, better and more fulfilled than I could ever imagined. I love you to the moon and back.

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Contents

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Symbols and Abbreviations

L1: First language /Mother tongue

L2: Second/Foreign language

DDL : Data-driven Learning

COCA: Contemporary corpus of American English

ADJ : Adjective

AN : Adjective+ Noun

VN : Verb+ Noun

VKS : Vocabulary knowledge scale

VST : Vocabulary size test

MI : Mutual information

NNS : Non-native speaker

NS : Native speaker

SLA : Second language acquisition

Chapter 1
Introduction

A growing body of literature has recognized the essential role that vocabulary knowledge plays, and as such, is considered as a backbone of learners' capacity for a language (Alderson, 2007; Milton, 2009; Zimmerman, 2001). The role of vocabulary knowledge has been addressed by many researchers, such as Wilkins (1972), who claimed that "without grammar very little can be conveyed; without vocabulary nothing can be conveyed (p.111)". Likewise, McCarthy (2008) highlighted the need for vocabulary by stating that no matter how well knowledge of grammar, sounds, or other skills are mastered, without adequate knowledge of words a meaningful communication cannot exist. Thus, when the position and significance of a rich repertoire of vocabulary knowledge is considered, it would not be wrong to assert that vocabulary knowledge is a prerequisite for successful and appropriate language use. For these reasons, learning and teaching vocabulary has sparked a great deal of interest in the last few decades, and considerable attention has been paid to aspects such as teaching (Nesselhauf, 2003; Wood, 2012; Yunus & Awab, 2012; Zarei & Tondaki, 2015), learning (Nesselhauf, 2005), processing (Laufer & Waldman, 2011; Schmitt, Jiang, & Grabe, 2011; Webb, 2013) and assessment of vocabulary knowledge (Read, 2000; Milton, 2009; Üstünbaş & Ortaçtepe, 2016). These researchers point to the multifaceted nature of vocabulary knowledge and its complexity, as it involves various word knowledge components, resulting in disagreements on definitions or descriptions of these components. Among the many questions and uncertainties, most of the intervention studies in this regard have focused on increasing the vocabulary size of learners. As such, unequal attention has been given to how well or which knowledge components of vocabulary are learned or known by language students.

On the other hand, in recent years, the traditional conception of vocabulary research has shifted from a focus on the teaching and learning of single-word units to multi-word units, or "formulaic sequences," which are defined as word strings that "have become conventionalized in a given language as attested by native-speaker judgment and/or corpus data" (Boers & Lindstromberg, 2012 p. 83). Such formulaic sequences have come to be widely regarded as an essential source for fluent and idiomatic language use (Durrant & Schmitt, 2008), as they are considered to be a

factor in distinguishing the speech of native from nonnative speakers (Conklin & Schmitt, 2007), as well as lower-level versus advanced-level learners (Boers & Lindstromberg, 2012). The psycholinguistic reasons for this prominence have been explained by Boers et al. (2006), who claim that use of these sequences give L2 learners native-like competency, helping them retrieve “chunks” of language from memory and leading to fewer hesitations and more fluent language production in real time conditions.

In this regard, according to recent corpus findings, collocations, as a sub-category of formulaic sequences, have been found to be the most commonly used multi-word units among native speakers. The proportion of collocations in native speaker discourse has been found to be as high as one-third to one-half of any type of discourse (Erman & Warren, 2000). As such, collocational knowledge is a subject worth considerable attention, especially in L2 settings, where collocations are considered to be an important aspect of the language learning processes. The importance directed to the role of collocations in foreign language achievement has been highlighted for decades (e.g., Lewis, 2000; Durrant & Schmitt, 2009; Peters, 2014). Research that has emerged in this regard indicates that collocational knowledge is an essential part of language use, processing, and acquisition; it has been concluded that this knowledge must be retained in the long-term memory (LTM) in order to improve language proficiency (Nation & Webb, 2011).Given the importance of collocations in L2 learning, as well as Cowie’s (1992) claim that sufficient knowledge of multi-word units plays a vital role in L2 learners’ ability to speak or write at an acceptable level, numerous studies have been conducted. The overall picture emerging from these works reveals that, regardless of years of education, L2 learners have problems with using collocations (Laufer, 2010); and that learners at varying proficiency levels fail to comprehend and produce collocations appropriately (Boers & Lindstromberg, 2012; Webb, Newton, & Chang, 2013; Yunus & Awab, 2012; Zarei & Tondaki, 2015).

Given the clear necessity for developing collocational knowledge in a second or a foreign language and the constant failure of L2 learners in producing collocations, a great deal of effort has been exerted to find the reasons for this ongoing issue, and researchers have devoted close attention to finding interventions to facilitate their receptive and productive knowledge. One factor that has been

considered in this regard is retention of multi-word units. The related literature reports that successful vocabulary retention depends on two factors: the number of encounters (Schmitt, 2006; Webb, 2007), and the quality of the input (Folse, 2006; Laufer & Rozovski-Roitblat, 2011). Nation (1990) points out that long-term retention of vocabulary items can be achieved by at least fourteen encounters in different contexts (Nation, 1990); accordingly, Laufer (2005) supports engaging learners in word-focused activities. However, despite the existence of research on the effects of the number of encounters or the quality of exposure on the retention of words, the effects of these factors on collocation learning has not been closely investigated. On the other hand, it has been reported in some studies that learners, while producing the target language, make up word combinations that do not often occur together in English (Nesselhauf, 2005; Laufer & Waldman, 2011). This may stem from their insufficient knowledge, which should be developed by classroom instruction that is on the basis of fundamental principles determined by research findings.

The development of online sources has influenced the field of foreign language teaching, reshaping the views of both learners and teachers in their efforts to learn and teach vocabulary (Chapelle, 2001; Murray, 2000). For example, due to the expansion of internet and new media technologies over the past decade, a wealth of digital dictionaries has become available (Jin & Deifel, 2013). As the number and quality of these dictionaries have increased, empirical studies have been conducted to investigate their effects. In such one study, Laufer and Hill (2000) found that incidental vocabulary learning can be triggered by these resources, as they contain a great deal of contextual information. From this perspective, Nation's (2000) emphasis on the frequency and range approach – in that learners need to pay attention first to frequent and immediately useful collocations, and then to a range of related formulations in different contexts – may be addresses. Similarly, Hill (2000) points out that providing learners with recurring patterns of concrete examples in texts can be an effective way of teaching collocational patterns. To achieve this, the use of corpora and concordancing, tools that allow learners to access to all instances of a linguistic form or structure in their own context, has become popular in supporting the growth of vocabulary knowledge. When a multi-word unit needs to be examined, for example, the unit is scanned, located and listed

with the help of a software program so that learners can see which word goes together with other words, the patterns those words follow, which prepositions those words go with, and so on (Willis, 1990) This complied list is called a concordance, defined as a "huge list for the occurrences of the lexis at hand" (Biber et al., 1998, p. 15)

In line with Piaget's Constructivist Learning Theory, which holds that learners need to take control of their own learning by constructing knowledge and meaning from their own experiences, the originator of Data-driven Learning Approach (DDL), Johns (1991), suggests that language learners must be provided with authentic linguistic data access, must act as a language researcher of corpora. This is to be achieved by means of concordance output, which offers various instances of authentic patterns in different contexts. This process facilitates effective learning, with the potential to prepare students to be more independent outside the classroom. Such an approach shifts the role of the teachers from that of a language expert to a language learning facilitator, resulting in independent and autonomous learners who can control their own learning. Concordance lists have been heavily used within the framework of DDL; Johns (1991a) lists three major advantages of using concordancers in language pedagogy. The first advantage is that concordance, as a computer tool that helps learners make enquiries and speculations, develops the ability to observe patterns in the target language and make generalizations about language patterns. The second contribution is the change it offers with respect to the roles of teachers, putting them in the position of coordinators or advisors who encourage students take the charge of their own learning. The third advantage of DDL is its innovative way of raising grammar consciousness by placing learners at the center of language analysis in the grammar description phase and helping them to discover the rules through authentic evidence.

With these considerations in mind, and given the numerous studies published on this issue, the past two decades have witnessed a revived interest in vocabulary teaching through web-based concordancing in foreign and second language learning (Anğ, 2006; Al-Seghayer, 2001; Aston, 2001; Horst, Cobb, & Nicolae, 2005).

Recent attention has also been focused on studying collocations with references to Parallel Corpus with the aid of concordancing. This is a tool that allows learners to compare two contexts side by side (one in the target language, and the other an L1 translation) for a given item (Barlow, 1996a; Lixun, 2001; Wang, 2001). Parallel Corpus gives learners a chance to compare the contexts for a particular item in one language together its translations, allowing them to see how the item is used according to contextual elements (Roussel, 1991, as cited in Lixun, 2001). In this regard, Barlow (1996a) claims that parallel texts (texts that are translations of each other) are valuable sources for a number of language learning research projects, as they aid learners in investigating the main similarities and differences between particular words and structures in both languages. Through obtaining concrete knowledge of these correspondences, beginning learners can develop their awareness of the feel of a second language. Advanced learners, moreover, continue to deepen their knowledge, understand the most common meanings of a word and perceive clues to the appropriate meaning by examining the related discourse and genre (Barlow, 1996a). In this regard, Lixun (2001) claims that DDL, with the support of parallel concordancing, can effectively increase learners' knowledge of lexical meaning and use by presenting instances of word usage in authentic context. As development of such software is labor intensive, in this study, a paper-based version of parallel texts was used to teach target collocations; the effects of corpus consultancy on the collocational knowledge of the participants was also investigated. The results of the treatment were compared with participants who consulted online bilingual dictionaries.

Statement of the Problem

Attached particular importance to collocation instruction in literature has resulted in a wider recognition of it on the part of researchers, teachers, and language practitioners (McCarthy & O'Dell, 2005; Nesselhauf, 2003). In acknowledging the benefits of collocational knowledge with respect to developing language competence, instruction in this skill has been allocated in academic curricula (Lewis, 2000). However, learning collocations has been reported to pose some difficulties, and learners' production have been observed to contain numerous collocational errors (Bahns & Eldaw, 1993; Laufer & Waldman, 2011; Nesselhauf,

2005). Granger (1998) extrapolated on these findings with a larger amount of data consisting of learner productions which were analyzed via computer technology and revealed widespread learner difficulty in using collocations. Given this concern, the necessity of teaching collocations explicitly has received considerable support, with researchers, classroom teachers and even learners seeking an effective approach for teaching and learning multi-word units.

In addressing this concern, vocabulary instruction has been reshaped in recent years, as the efficiency of traditional techniques (e.g., writing definitions of unknown words or glossing them in a paragraph) has been questioned. Vocabulary teaching approaches that require more student involvement in the learning process have been considered as more effective for learning and retention of unfamiliar terms; thus, growing appeals for data-driven techniques in second language classrooms have been raised.

When learners' awareness of the process of learning is stimulated, and when they are able to manage the complex network of learning, they feel less dependent on the teacher and can track of their own learning, allowing them to make decisions about the difficulties they encounter on their learning journey. The rise of computer-assisted language learning has brought about new possibilities in this regard, and data-driven techniques are now commonly used for learning of lexical items or grammar rules. Using DDL, learners can more easily induce patterns and create their own learning experiences.

However, despite all of the existing studies on collocation learning, there remains a mismatch between research theory and practice. Despite numerous difficulties witnessed in using collocations in a foreign language, only a limited number of studies have addressed affective approaches in collocation instruction in language classes. Furthermore, most of these have focused on issues such as the relationship between collocations and vocabulary size; how collocations have been used by learners; or the extent of the collocational knowledge of learners, while little attention has been given to searching for a more effective way of teaching them. Therefore, experimental studies on the basis of collocation learning are still needed to gain deeper insight into how receptive and productive collocation knowledge can be developed in learners. Moreover, improved language teaching implementations are needed to pave the way for learners to become more independent in the language learning process. Thus, empirical support must be found for more effective

and prominent approaches to teaching collocations. This study is, therefore, concerned with the comparison of two approaches in collocation learning in relation to a control group. One of these is a corpus-based approach, through which learners utilize a corpus to learn target collocations. The other is a paper-based parallel text approach, which is an adaptation of a bilingual corpus on paper; this implementation was carried out to address the lack of availability of an English-Turkish corpus.

Aim and Significance of the Study

Despite ongoing advances in language teaching and learning methods, materials, and curricula, many language learners around the world still display poor outcomes with respect to the target language (Höl, 2016; Williams & Burden, 1997). In Turkey, for example, although compulsory English education starts at the age of 7, when students are in the 2nd grade, the majority of individuals still experience major problems with foreign language classes when they reach the university level (Bayyurt, 2012). As mentioned previously, words are “the basic building blocks of language, the units of meaning from which larger structures like sentences, paragraphs and whole texts are formed" (Read, 2004, p.1), and thus, lexical knowledge plays an essential role in language competence and performance. However, one of the difficulties learners generally encounter is the ability to sufficiently learn and accurately use vocabulary items in the target language. In this sense, developing adequate vocabulary knowledge means knowing much more than individual words or phrases; rather, it involves knowledge of the formulaic sequences that compose a large part of written and spoken discourse (Erman & Warren, 2000; Foster, 2001). Collocation knowledge, as a sub-category of formulaic language, has been highlighted by many researchers in terms of learner performance (Lewis, 2000; Nation, 2001; Wray, 2000). In fact, collocations are suggested as composing of the majority of natural language, and therefore, acquisition of a large number of these chunks of language should give learners the ability to communicate, produce and comprehend the target language successfully (Wray, 2000). With this in mind, studies that investigate effective approaches to teaching collocations have raised interest among applied linguists. Likewise, this study aims to determine the effectiveness of an approach to teaching collocations with the help of technology. Digital tools provide new opportunities for storing

spoken and written language, as well as analyzing various occurrences of the language and considering their individual contexts (Hyatt 2005). Such data is authentic and freely available, thus facilitating learners in taking control over their own learning -- an idea that has received a great deal of attention over the last three decades. In more recent years, in particular, attention has been focused on approaches such as web-based concordancing of monolingual or bilingual sources; and the efficacy of these tools has been investigated in the context of teaching and learning collocations (Anğ, 2006; Aston, 2001; Barlow, 1996a; Boers & Lindstromberg, 2012; Yunus & Awab, 2012). However, only a limited number of studies have explored development of collocation knowledge through data-driven techniques, and this topic has remained unexplored in the Turkish context.

Furthermore, while research on using corpora to teach vocabulary has proliferated in recent years, the use of parallel texts in second language classrooms has not been widely adopted (Chujo, Anthony, & Oghigian, 2009). However, this practice has been noted as beneficial in that parallel texts aid learners in establishing mental links between first language and second language schemata, as well as in creating new L2 schemata in the cases of lack of reciprocity between the two language (Laviosa, 2002).

With this in mind, the present study aims to investigate the comparative effects of corpus consultancy and working on parallel texts in relation to using online dictionaries on EFL Turkish learners' acquisition of verb-noun and adjective-noun collocations. The study is significant in its attempt to offer suggestions to language teachers on innovative approaches to help their learners gain and store multi-words more efficiently in their memories.

Research Questions

In line with the aims, the current study addresses the following research questions:

1. Are there any differences between three groups of nonnative English speaking third-year ELT students (one group employing a web-based concordance, one group practicing with parallel Turkish and English texts, and one group using an online dictionary) in their acquisition of collocational knowledge?

2. What are the test scores of the group participants on their receptive knowledge of collocations?

a. Are there any differences in the overall test scores on the receptive knowledge of collocations between the three groups immediately after the intervention?

b. Are there any differences in the test scores on the receptive knowledge of form, use and meaning between the three groups immediately after the intervention?

c. Are there any differences in the overall test scores on the receptive knowledge of collocations between the three groups three weeks after the intervention?

d. Are there any differences in the test scores on the receptive knowledge of form, use and meaning between the three groups three weeks after the intervention?

e. Are there any differences between the three groups in the retention of their receptive knowledge of collocations?

f. Are there any differences between the test scores of the three groups in the retention of their receptive knowledge of form, use and meaning of collocations retention?

g. Which collocation combination (Adjective-Noun or Verb-Noun) is used more correctly on the receptive tests?

h) Is there any difference between the groups in terms of correctly used collocation combinations on the receptive tests?

3. What are the test scores of the three groups of participants on the productive knowledge of collocations?

a. Are there any differences in the overall test scores between the three groups on the productive knowledge of collocations immediately after the intervention?

b. Are there any differences in productive knowledge of form, use and meaning test scores between the three groups immediately after the intervention?

c. Are there any differences in total productive knowledge of collocations test scores between the three groups three weeks after the intervention?

d. Are there any differences in productive knowledge of form, use and meaning test scores between the three groups three weeks after the intervention?

e. Are there any differences between the three groups in retention of their productive knowledge of collocations?

f. Are there any differences between the test scores of the three groups in the retention of their productive knowledge of form, use and meaning of collocations?

g. Which collocation combination (Adjective-Noun or Verb-Noun) is used more correctly on the productive tests?

h. Is there any difference between the groups in terms of correctly used collocation combinations on the productive tests?

4. What are the participants' perceptions towards the corpus consultancy and practice on the parallel texts when learning target collocations?

Assumptions

This study assumed that the participants represented the target population. All the instruments used to gather the data were assumed to be appropriate and to elicit reliable data. It was also assumed that all the participants receiving the treatment understood the instructions and completed the tasks and tests honestly. Finally, the receptive and productive tests prepared by the researcher were assumed to assess the receptive and productive knowledge of the participants.

Limitations

Despite precautions taken to mitigate potential concerns, there are certain limitations that should be disclosed. First, as this was a quasi-experimental study carried out over several sessions, during which the participants underwent interventions and were then tested both immediately after and three weeks after the interventions, maintenance of participation in the study was a challenge. Namely, some loss occurred in relation to the subject being studied due to lack of attendance in previous sessions. Second, the items on the receptive and productive tests were limited in terms of the number the target collocations to alleviate test fatigue. With more test items, the results would better reflect the performance of the participants. Third, due to the use of multiple data collection instruments and interventions, each of which took at least 45 minutes to carry out, it was difficult to maintain the motivation of the participants to complete the tasks and tests. An effort was made to compensate for this issue by giving the participants 10-minute breaks and some incentives for completing the tests. Fourth, the participants were selected via purposive sampling on a voluntary basis; therefore, the findings may not be generalized to a wider population. Finally, as the number of participants in each group was too low for parametric tests, non-parametric equivalents of the tests were conducted. A larger participant sample would yield better results through parametric tests.

Definitions

L2 Receptive/ Productive Vocabulary. The receptive vocabulary refers total number of lexical items that are comprehended while reading and listening in a second or foreign language. The productive vocabulary refers to total number of lexical items that are used while writing and speaking in a second or a foreign language.

Collocation. This term, within the context of this study, is defined as frequently co-existing word combinations found close one another in a text (Nguyen & Webb, 2017).

Corpus. A corpus is defined as a collection of natural written and spoken texts compiled as representatives of a variety or a genre of a language (McEnery & Wilson, 2001). Thanks to advances in computer technology, this natural data can be analyzed and used for pedagogical purposes in language classrooms, allowing learners to benefit from a wide range of authentic samples of language data from which they can derive information and make generalizations to improve their interlanguage.

Corpus approach. Within the framework of corpus linguistics, this theoretical approach is used to describe various dimensions of a language, such as its grammatical, lexical and structural aspects. This approach allows language learners to induce the patterns of the language through exposure to a variety of occurrences of the same structure in different contexts; it is also used for analysis of empirical data.

Concordance. This term is defined as a "huge list [of] the occurrences of the lexis at hand" (Biber et al., 1998, p. 15). A concordance is used as a tool to quickly reveal many important language patterns in a text; as such, it is at the center of corpus linguistics (Sinclair, 1991). The most common format of concordance lines is KWIC (Key Word in Context), which sorts and aligns keywords in a wide layout, also giving the opportunity to check for the context of the keywords.

Parallel texts. This refers to a system where the original text and its translation equivalent are placed side by side in parallel (Kenning, 2010). The importance of such texts has been highlighted, as they offer valuable information that help learners see the intra- and interlingual dimensions of both languages.

Online dictionary. This type of dictionary is accessible via computer or smart phone through the internet on the World Wide Web**.** In such dictionaries, queries are made by typing the query term in a search box and clicking the enter button.

Formulaic language. Schmitt (2010) defines this term as a language that consists of collocations, idioms, proverbs, fixed expressions, and free combinations.

Receptive knowledge. This refers to the ability to recognize and recall a lexical item in its spoken or written form (Pignot-Shahov, 2012).

Productive knowledge. This term denotes the ability to use multiple aspects of a lexical item appropriately while writing and speaking (Pignot-Shahov, 2012).

Vocabulary size or breadth. Vocabulary size refers to all of the words that an individual recognizes and understands (Schmitt, 2014).

Chapter 2

Literature Review

This chapter addresses the literature related to the main topics investigated in this study. It begins with a discussion of the significance attached to the role of vocabulary in foreign language teaching and learning. Then it explicates the pedagogical value of collocations by exploring the definitions attached to them and the findings of the related literature on different forms of instruction in collocation teaching. Afterward the literature on measuring and enhancing collocational knowledge is discussed.

Role of Vocabulary in Learning a Foreign Language

Language learning is an exceedingly long journey in which the traveler is expected to expand his/her interlanguage as much as possible by resorting to many language learning strategies. In this journey, vocabulary knowledge is like a conductor who aids and meets the demands of the traveler by offering him/her the necessary assistance to feed his/her language competence and performance. This conductor is an indispensable part of the journey, as acquiring a second lexicon is an overwhelming task, especially if the objective is to achieve literacy in the second language (Horst, Cobb, & Nicolae, 2005). Due to its importance, the role that vocabulary plays in language teaching and learning has been extensively investigated; the results have largely emphasized that vocabulary knowledge facilitates the ability to function effectively in a language (Harmer, 1991; Lewis, 1993; Read, 2004; Malone, 2018). Harmer (1991), for instance, claims that “vocabulary is like the vital organs and the flesh of the body, whereas structures are the skeleton” (p. 153). In a similar vein, Read (2004) asserts that "words are the basic building blocks of language, the units of meaning from which larger structures like sentences, paragraphs and whole texts are formed" (p. 1). Schmitt (2000) highlights this importance by maintaining that “lexical knowledge is central to communicative competence” (p. 55), as vocabulary knowledge is considered to feed other language skills, as well. In this regard, Nation (1994) points out that “a rich vocabulary makes the skills of listening, speaking, reading, and writing easier to perform” (p. viii).

Despite the essential role that vocabulary knowledge plays, vocabulary learning is one of the main challenges facing learners during their foreign language learning journey (Benkhenafou, 2015). Many second language learners are concerned about the difficulty of vocabulary learning and worried about how to cope with the tremendous task of learning a huge number of words (Hulstijn, 2001). Therefore, both L2 learners and teachers, believing in the necessity of knowing a rich repertoire of words, have shown a keen interest in finding effective ways of learning them (Laufer & Hulstijn, 2001). Over the years, because of this interest, the principal priorities of language teaching have been reshaped, focusing on more acquisition, and learning of vocabulary than on grammar and other skills.

However, despite the difficulties of the task, it becomes progressively manageable if learners' awareness of what knowing a word means is raised, as vocabulary knowledge refers to many other skills than knowing a large number of words. In this sense, Schmitt (2008) comments that, due to the complex nature of vocabulary learning, it is sensible to accept that the method of learning this knowledge might have its own complexities. Thus, the question "what knowing a word or vocabulary knowledge means?" comes to mind.

What is Involved in Knowing a Word?

A word is defined as "A single distinct meaningful element of speech or writing" (Oxford Online Dictionary, n.d.). Language learners often believe that knowing a word refers only to its meaning and form. However, this distinct meaningful element in fact encompasses many aspects, such as meaning, form, pronunciation, letters, syllables, part of speech, and so on. As such, the knowledge of a word is a complex construct (Schmitt, 2010) and multifaceted (Pignot-Shahov, 2012); and as Henriksen (1999) and Nation (2001) point out, vocabulary learning occurs on a multidimensional continuum (Henriksen, 1999; Nation, 2001). Moreover, according to Schmitt (2000), vocabulary knowledge involves not just a word's meaning, but orthographical knowledge, phonological knowledge, grammatical knowledge and register knowledge. Therefore, to begin to understand the various aspects of word knowledge, the distinction between type and token needed to be known, wherein "the total number of word forms" constitutes tokens,

while “the total number of different word forms” are referred to as types (Read, 2000, p. 18). Type, in this regard, can be characterized in terms of function words (grammar of words) and content words (meaning and semantic content of words). With respect to this distinction, knowledge of vocabulary can be regarded as the knowledge of content words; however, this perspective may result in neglecting other aspects of word knowledge. Different forms of content words can be produced by grammatical inflections by adding to the base forms of words; and different meanings of these base forms can be produced with derivational affixes. Yet the definitions of all these aspects of a word are not enough for explaining what is involved in knowing a word; as Nation (1998) asserts, this also requires knowing the written and spoken forms of a word through the ability to use it grammatically and semantically correctly and knowing its collocates, cultural, stylistic and register constraints.

Given this complexity, learners may have difficulties in attaining information on all aspects of a word. Moreover, teachers cannot give this information to their learners all at once, which creates a need for a systematic process of teaching words (Nation, 1998). Therefore, Nation proposes consciousness-raising activities consisting of receptive and productive skills, immersing learners in the world of the words and leading them to acquire different aspects of word knowledge.

Putting forth another model of learning, Nation (2001) claims that knowing a word means knowing its forms, positions, functions, and meanings, as well as its collocations and frequencies. In other words, Nation views vocabulary knowledge as a construct comprising form (pronunciation, spelling and word parts), meaning (form/meaning relationships, concept and referents and associations) and use (grammatical functions, collocations and constraints on use), each of which can be acquired productively and receptively, as outlined in Table 1.

Table 1

Aspects of Vocabulary Knowledge

Form	Spoken
	Written
	Word Parts

Meaning	Referents
	Underlying concept
	Associations
Use	Grammatical functions
	Collocations
	Constraints on use (register, frequency etc.)

(Nation, 1998, p. 11)

With this in mind, Nation (2001) proposed a comprehensive framework in which the aspects of word knowledge are explained according to receptive and productive knowledge (see Table 2).

Table 2

What Is Involved in Knowing A Word (Nation, 2001)

FORM	Spoken	[R]	What does the word sound like?
		[P]	How is the word pronounced?
	Written	[R]	What does the word look like?
		[P]	How is the word written and spelled?
	Word parts	[R]	What parts are recognisable in this word?
		[P]	What word parts are needed to express the meaning?
MEANING	Form and meaning	[R]	What meaning does this word form signal?
		[P]	What word form can be used to express this meaning?
	Concept and referents	[R]	What is included in the concept?
		[P]	What items can the concept refer to?
	Associations	[R]	What other words does this make us think of?
		[P]	What other words could we use instead of this one?
USE	Grammatical functions	[R]	In what patterns does the word occur?
		[P]	In what patterns must we use this word?
	Collocations	[R]	What words or types of words occur with this one?
		[P]	What words or types of words must we use with this one?
	Constraints on use	[R]	Where, when and how often would we expect to meet this word?
		[P]	Where, when, and how often can we use this word?

As shown in Table 2, Nation (2001) divided the first category into three subcategories: “spoken”, “written,” and “word parts”. The receptive aspect of the “spoken” category is defined as knowing what the word sounds like, while being able to pronounce the word is noted as the productive aspect. Furthermore, in the “written” subcategory, knowing what the word looks like is indicated as receptive, while knowing how the word is spelled and written is considered to be productive knowledge. The third subcategory of the knowledge of use, “word parts,” refers to

the recognizable aspects of the word as receptive knowledge, while using the word parts that are needed to express intended meaning is considered to be productive knowledge. This categorization helps researchers and language teachers observe the aspects of word knowledge that cause difficulties for learners and offers them insights into what they can do to increase learner success.

The second category, “meaning,” is also divided into three subcategories:” form and meaning, “concepts and referents,” and “associations.” Here, receptive knowledge of form and meaning is considered as understanding the meaning signaled by the word, while productive knowledge of form and meaning refers to using word forms to express meaning. In the “concepts and referents” and “associations” subcategories, moreover, receptive knowledge refers to understanding meaning of words depending on different contexts, and productive knowledge refers to using words properly according to context.

The “knowledge and use” category (Nation, 2007) is likewise divided into three sub-categories: “grammatical functions,” “collocations” and “constraints in use.” In this regard, knowledge of the “grammatical function” of a word refers to knowing which part of speech a word belongs to, denoting receptive knowledge,), while knowledge of how to use the word accordingly relates to productive knowledge of use. The “collocation” subcategory, on the other hand addresses knowing which words go together. Receptive knowledge of use in this category concerns being able to understand collocates of the words, while productive knowledge refers to being able to use words together that are collocates of one another. The final subcategory, “constraints in use,” involves noticing when, where and how often a o may encounter a word; this is categorized as receptive knowledge of use, whereas knowing when, where and how often one may use a word is categorized as productive knowledge of use. The present study focuses on the” written” subcategory of ”Knowledge of Form,” the ”form and meaning” subcategory of ”Knowledge of Meaning,” and the ’collocation” subcategory of ”Knowledge of Use.”

Dimensions of Vocabulary Acquisition

With respect to the dimensions of vocabulary acquisition, Henriksen (1999) suggested three continua for lexical competence: (a) partial to precise knowledge, (b) breadth and depth of knowledge, and (c) receptive and productive knowledge.

Partial to precise vocabulary knowledge. The incremental nature of vocabulary learning (Henriksen, 1999; Hunt & Beglar, 2005; Schmitt, 2000) creates challenges to mastering second language vocabulary, as learners are expected to understand different aspects of vocabulary knowledge (Nation, 2001; Schmitt, 2000). However, limitations in the number of contexts that are encountered, and the degree of exposure constitute obstacles to complete mastery, as "vocabulary learning is not an all-or-nothing piece of learning but is rather a gradual process of one meeting with a word adding to or strengthening the small amount of knowledge gained from previous meetings" (Nation, 2001, p. 155). In this regard, Nation (1990) argues that learners need to encounter a word from 7 to 16 times or more to learn it thoroughly. In this process, learners may acquire partial vocabulary knowledge, which refers to the level of development of individual word knowledge, eventually achieving precise vocabulary knowledge, wherein they know all aspects of a particular word. In other words, starting from superficial familiarity with the word, each encounter with a word adds something to the learners' knowledge of that word, which accumulates over time and leads learners to use the word correctly while producing it (Laufer & Goldstein, 2004). For example, Schmitt (1998), in an attempted to describe acquisition of individual words, conducted a longitudinal study revealing that learners had few problems with spelling, but encountered problems with the derivational forms and meaning senses of all words. These learners were observed to expand their knowledge of the meaning senses of the target words 2.5 times more often than they forgot them. Overall, his study showed that complete mastery of the words in the students' mental lexicon was a gradual process. In consideration of this gradual process, teachers or researchers should pay close attention to directing learners toward mastery of precise word knowledge.

Breadth and depth of vocabulary knowledge. In the field of second language acquisition (SLA), the importance of measuring the vocabulary size of learners has been emphasized, because vocabulary knowledge is considered to be a strong predictor of language proficiency (Schmitt, Jiang, & Grabe, 2011).

Therefore, specific information on the breadth and depth of learners' vocabulary knowledge, obtained through testing, may aid language teachers in shaping the instructional process.

Breadth of vocabulary knowledge in this context is generally defined as the number of words a person knows (Anderson & Freebody, 1981), or more practically as a general estimation of the number of the words a person knows as determined by a specified level on a vocabulary list (Read 2004). Breadth of vocabulary knowledge is also referred to as vocabulary size (Meara 2005), which denotes the number of words that a learner knows (Nation & Waring, 2002). There have been many attempts in the literature to identify learners' vocabulary size through various instruments (Hu & Nation, 2000; Meara, 1996a; Nation, 2006, Nation & Beglar, 2007). The measurement of these instruments is primarily on the basis of word families (Pignot-Shahov 2012), a string of words with a common base to which different affixes and derivates are added (Schmitt, 2008). As knowing one member of word the word family and having an average level of command of the derivation process aids learners in finding the meaning of an unknown word (Schmitt 2010), the measurement of vocabulary size is essential to predicting learners' overall proficiency in different skills. In this sense, vocabulary size tests give valuable insights about vocabulary breadth to language teachers in setting goals for their learners (Pignot-Shahov, 2012). Additionally, measures such as vocabulary size tests aid researchers in comparing how learners with a specific vocabulary size function in a language, as well as determining the vocabulary gain of learners after certain period of time spent with a specific treatment intended to expand their word knowledge. Through this process, researchers can identify how much word knowledge is needed to perform a task, and then language tasks can be planned and implemented accordingly (Meara, 1996).

In order to develop sound theories about vocabulary size and its effect on language competence, these questions need to be answered: (i) "How many words do native speakers know?" and (ii) "How much vocabulary do you need to use another language?" (Nation & Waring, 1997, pp. 6-7). Nation (2001) claims that, in each year of their early lives, native speakers acquire around 1,000-word families, graduating from universities with a vocabulary size of around 20,000. This goal may not be achievable goal for foreign language learners. Moreover, different vocabulary

sizes are needed to be sufficiently qualified in different language skills (Nation & Beglar 2007). Therefore, attempts have been made to determine the number of words that a learner needs to know for successful orientation in a foreign language. For example, Schmitt (2008) asserts out that, with respect to successful listening, knowing 6,000-word families means that a learner knows 28,015 individual words. In a similar vein, regarding effective reading, knowing 8,000-word families equates to knowledge of 34,660 individual word forms. Research by Laufer (1998), moreover, revealed that a learner requires 95% coverage to comprehend a text and to guess unknown words, while Nation (2006) holds that a learner needs to know 8,000-9,000-word families to master the skill of speaking (Nation 2006).

While breadth of vocabulary knowledge deals with the number of words or word families an individual knows, depth of vocabulary knowledge involves word knowledge (synonym, antonym, pronunciation, collocational meaning etc..) on a deeper level. Although assessment of vocabulary depth has been a controversial issue (Chapelle, 2001), some of these aspects are commonly measured by the Word Associates Test (WAT) developed by Read (2000). With respect to foreign language learning, two general approaches have been proposed for the assessment of second language vocabulary depth (Read 2000). The first is the “developmental” approach, which describes word mastery as an ongoing process starting from not knowing anything about a word to mastering it fully. This knowledge is represented by the Vocabulary Knowledge Scale developed by Paribakht and Wesche (1996). The second is called the “dimensional” approach, which holds that word knowledge involves knowing both the receptive and productive senses of form, use and meaning in both spoken and written language (Schmitt 2010).

Receptive and productive word knowledge. Another classification for word knowledge is the receptive and productive knowledge types (Milton 2009). This distinction is on the basis of Palmer’s (1921) idea of the ability to recognize a word in a given context and the ability to produce it in speaking and writing. Receptive knowledge refers to the ability to recognize the form of a word, understand its meaning, and provide its synonym and its translation in the first language. This knowledge type is often associated with reading and listening skills. On the other hand, productive knowledge, associated with speaking and writing, is defined as the ability to produce the word. Productive knowledge is subdivided into two categories:

controlled and free productive knowledge. The former refers to ability to produce the word with cues, while the latter refers to spontaneous use of a word (Laufer 1998). As with depth of vocabulary knowledge, there have been controversies around how to measure these skills accurately.

The literature on vocabulary research confirms that receptive word knowledge is gained more rapidly than productive word knowledge (Laufer & Paribakht, 1998; Nation, 2013). Furthermore, receptive knowledge tends to remain larger than productive knowledge (Chen & Truscott, 2010; Laufer, 2005; Laufer & Goldstein, 2004; Melka, 1997; Webb, 2007a) A detailed explanation for these differences was offered by Schmitt (2014), who explains that accurate and appropriate production of a word requires word knowledge aspects such as word classes, collocations or grammatical functions. On the other hand, receptive understanding of a word requires only knowing the form-meaning link, as learners are better able to recall the meaning of a word when it is seen in context. Schmitt's (2014) explanation indicates that receptive knowledge is a prerequisite for productive knowledge. However, the question concerning the relationship between these knowledge types in terms of the necessity of a threshold level for receptive knowledge to lead to production has not been clearly resolved. From one perspective, Meara (1997) proposed a "connection approach," which holds that the number of encounters, the quality of the exposure and networks between lexical items determine the shift from receptive and productive knowledge. However, he rejected the speculation of a continuum along which learners move from a receptive to a productive knowledge state; rather, he posed that newly acquired words change status with the new associations built between other words. On the other hand, Melka (1997) and Read (2000) regard receptive and productive knowledge as a continuum, in which receptive knowledge of a word is acquired first, and when this knowledge reaches a sufficient level, productive knowledge emerges.

The continuum between receptive knowledge and productive knowledge can be likened to that of declarative and procedural knowledge, as, according to DeKeyser (1997), all kinds of learning follows this. In this regard, according to Anderson's (1990) ACT (Active Control of Thought) model of memory, declarative knowledge can be defined as having information about different facts or events; procedural knowledge, on the other hand, can be seen as knowing how to perform

something. With respect to language and language learning, in particular, declarative knowledge refers to lexical, syntactic and pragmatic knowledge, while procedural knowledge refers to oral and written production. Ellis (2009) explains that the transition from declarative to procedural knowledge takes place in three stages. The first of these is the declarative stage, wherein new information is stored. In SLA, according to Schmitt's noticing hypothesis (1990), in order for information to be stored, it must first be noticed, as. noticing is essential for acquisition. When a learner notices an unknown word or a grammatical point, he or she detects it with selective attention for input processing. When the input is filtered with selective attention and stored in working memory, it is ready to be stored in the long-term memory. Therefore, in the first stage of declarative memory, according to Ellis (2009), learners should notice the structure and be aware that it bears certain rules that can be generalized.

The second stage in this process is the associative stage, which calls for associations to be made with the newly noticed structure and the one that already exists in the brain. This is done by deconstructing the structure and applying a general rule to a particular instance. As Anderson (1983) pointed out, learners in this stage are prone to making errors, as it requires reformulation of structures for different meanings. For example, learners may tend to overgeneralize a grammar rule or overextend a lexical item. Furthermore, as association proceeds with newly encountered structures, L1 interference may also cause production of erroneous structures in the target language. Selinker (1972) refers to the language in this stage as "interlanguage," denoting the language system developed by a learner of a second or foreign language that cannot be regarded as either first language or target language; rather, it is a system that falls in between the two.

The third stage of declarative knowledge is the procedural stage, also known as the autonomous stage. At this point, according to Ellis (2009), the mind keeps on making generalizations, but it also discriminates the necessary parts of specific cases, which results in correct usage of irregularities. At this stage, procedures become more automated. Practice and repetition are needed to achieve automaticity in language production. Once learners gain this automaticity, using the language is easier and less mind-occupying, which gives extra energy and resources for the mind to focus on other processes and tasks.

In sum, learners of a second or foreign language need to go through these stages in order to achieve automaticity through the process of noticing, detecting structures with selective attention, internalizing input, and producing the language appropriately.

Multi-word Units and Collocational Knowledge

After the intensive discussion of what is involved in knowing a word, the interest of researchers and pedagogical practitioners has shifted from investigating acquisition of all aspects of single-word units to searching for how multi-word units such as collocations are acquired, as well as identifying the best ways to teach them. Firth (1957) first presented the term collocation, defining it as “the company that the words keep” (p.183). Since the introduction of this term, finding common ground for the precise definition among researchers has been difficult, as it has been viewed through diverse theoretical lenses. Wray (2002), for instance, found that when researchers tend to explain the phenomenon of two or more words co-occurring, they use over 40 different terms, such as formulas/formulae, formulaic speech, formulaic sequences, fixed expressions, and so on.

Researchers have focused on collocations from three main perspectives: the frequency-based approach, the phraseological approach, and a combination of these two perspectives.

The frequency-based approach. The frequency-based approach defines collocations as frequently co-existing word combinations (Nguyen & Webb, 2017). This approach was heavily influenced by the British scholar John Rupert Firth (1957), whose oft-cited quote “You shall know a word by the company it keeps,” (p. 179) is central to this view. The frequency-based approach uses statistical measures to name collocations by investigating the frequency of their occurrences, such as mutual information scores (MI) and T scores. One of the advocates of this approach, Sinclair (1991), defines collocations as “the occurrence of two or more words within a short space of each other in a text” (p.170) and introduces three terms to denote a collocation: node, collocate and span. “Node” refers to the word under investigation, while “collocate” refers to the word coming to any side of the node. “Span,” on the other hand, refers to the number of words permitted to be used on any side of the node. For example, in the sentence “It’s necessary to raise

awareness that eating fast food is very dangerous,", the node word is "awareness," or the word under investigation. The collocate here is "raise," and there is one span between the collocate and the node. The span length has also been a matter of discussion, as some researchers argue that too narrow a span may cause the loss of a substantial number of real collocations; while too broad a span may result in the involvement of a great number of non-collocational items into a search. Therefore, finding a balance between two extremes is recommended (Durrant, 2014).

According to this approach, frequency is another criterion used to define collocations. In this respect, collocations are only identified if the words co-occur frequently. Concordancing serves as a useful tool to sort co-occurring words together, aiding researchers to see multi-word units coming together "with a probability greater than chance" (Halliday, 1966, p. 156).

However, Nesselhauf (2005) points out a drawback to this approach, noting that it fails to take syntactic relationships between the elements of a combination into account, thus overlooking an important element for the identification of a collocation. In addition, some researchers consider that taking co-occurrence as the only criteria may be misleading, as some words may come together due to semantic or syntactic associations (Hama, 2010).

The phraseological approach. Unlike the frequency approach, the phraseological approach regards collocations as word combinations consisting of lexical items that are syntactically related and transparent in meaning (Nizonkiza, Dyk, & Louw, 2013). If all the members of the collocation bear their literal meaning, they are thought to be fully transparent and are treated as "free combinations." On the other hand, if one of the members bears an idiomatic meaning, and the other holds its literal meaning, these are considered to be semi-transparent and are treated as a collocation (Nesselhauf, 2004). In other words, this approach treats word combinations as collocations if at least one of the members is used in a semantically non-transparent way. This approach has been criticized, as it does not place emphasis on the frequency of a collocation's occurrence, which may lead to ignoring a great number of collocations in learning materials (Henriksen, 2013).

The phrasal frequency-based approach. Both the frequency-based and the phraseological approaches attempt to define collocations depending on possible

syntactic and semantic features. However, limiting the definition to one or the other of these characteristics may leave out some lesser-used collocations. Therefore, the “phrasal frequency-based approach” combines the two previous two approaches, expanding the definition of collocation by involving frequency, semantic, and syntactic features altogether. (Gyllstad & Wolter, 2016).

Definition of collocations in the current study

As the construct of collocation has been defined differently by various scholars, identifying a precise definition may pose some challenges. Some clarification is provided by Schmitt (2004), who defines the collocations as multi-word units that are stored as a whole in the mental lexicon. In line with Schmitt’s definition, Wood (2010) points to collocations as “multi-word units which are stored in long-term memory as if they were single lexical units” (p. 38).

Within the scope of this study, the frequency-based approach to defining collocations has been followed, regarding them as word combinations that frequently co-occur in authentic language as determined by their MI score. The target collocations consisted of both verb-noun and adjective-noun collocation combinations. The frequency of co-occurrence of the combinations was established to be a minimum of 50 appearances in COCA corpus. Additionally, MI (mutual information) scores and T scores of the collocations were used to endure that word combinations are associated. The collocations used in the study have a frequency value of at least MI ≥ 3 and a t-score ≥ 2, according to the recommendation of Schmitt (2010). A detailed description of the target collocations is presented in the methodology section.

Models of Acquisition/Learning of Collocations

Considerable research has been devoted to understanding L2 vocabulary learning and use. Recently, drawing on previous studies on vocabulary learning, there has been a notable increase in investigations on how multi-word units, or formulaic language, have been learned by foreign language learners (Wray, 2013). The accumulated research in vocabulary acquisition indicates that formulaic

sequences constitute a high percentage of discourse (Nattinger & DeCarrico, 1992). Erman and Warren (2000), for instance, assert that 50% of the discourse they studied was formulaic. This pervasiveness has led to the identification of a variety of formulaic units, including collocations, lexical bundles, and collograms. Among these units of formulaic language, collocations have been particularly noted (Gablasova et al. 2017) as comprising a large portion of the native speakers' linguistic competence, aiding in communicating successfully and producing and comprehending ideas accurately (Wray, 2000). However, as learners deal with the enormous task of acquiring a large amount of vocabulary in their journey of foreign language learning, acquisition of collocations adds to the burden, as their nature is arbitrary and inconsistent (Benson & Lor, 1999). Yet, because native speakers draw from a mental lexicon of hundreds of thousands of lexical chunks that they can produce fluently, meaningfully and accurately in different contexts (Lewis, 2000), attempting to develop native-like proficiency necessitates learning these collocations successfully.

However, the process of learning collocations is not without challenges, and researchers have noted issues such as lack of attention and limited number of encounters (Boers et al., 2014), as well as interlexical and intralexical factors. In terms of interlexical factors, learner corpus studies have shown that congruency has an influence on learners' correct use of collocations (Laufer & Waldman, 2011; Nesselhauf, 2003). Nesselhauf (2003) defines congruency as the existence or absence of a literal L1 translation equivalent. That is, If L2 literal translation of a collocation can be done with a word-for-word translation in L1, the collocation can be regarded as congruent. In line with Nesselhauf (2003) and Peters (2012), Wolter and Gyllstad (2013) argue that acquisition of congruent and incongruent ones are different from each other, because in the latter case, foreign language learners cannot rely on their first language when they try to induce the meaning and form. Therefore, they may have greater difficulty in learning these terms.

Intralexical factors such as pronounceability, orthography, morphology, synformy and semantic features may also affect the learning of lexical items (Laufer, 1998). Studies on collocation learning have shown that longer words are more difficult to remember (Nation & Webb 2011), and in addition, Bishop (2004) claims that learners, without adequate guidance, are unable to distinguish useful

collocations from a mass of possibilities, resulting in failure to notice and understand them. In this respect, Nation (2001) emphasizes that collocates of the words must be recognized to be used properly, because “all fluent and appropriate language requires collocational knowledge” (p. 318). For this reason, Swan (1996) argues that unless collocations are deliberately selected, prioritized and incorporated into language material, learners will not be able to acquire them.

Given the issues outlined here, the matter of collocation learning has received considerable attention. However, the mental processes of collocation acquisition or learning are only in the initial stages of exploration, and further studies tracing the process are still needed. In the field of formulaic language studies, two prominent models that do provide insight into the acquisition and processing of these multi-word units have been presented in the literature: namely, Ellis’ (2001) and Wray’s (2002) models of collocation acquisition. The next session explores these two views.

Ellis’ (2001) collocation acquisition model. The idea of “chunking” in the collocation learning process dominates the view of this model. According to Ellis (2001), formulaic sequences are developed in the mental lexicon of the learners by associations between multi-word units which co-occur. Multiple encounters with these word combinations aid learners store them as “chunks” in their short-term memory, wherein these units are treated as single units to increase the processing ability of the short-term memory. Contending that the principle of chunking plays a vital role in language learning, Ellis explains the process by drawing on the “law of contiguity,” which holds that when events occur and experienced together, recurrence of one event triggers the recall of one another (James, 1890, as cited in Ellis, 2001, p.42). Ellis also argues that a higher number of formulations of these chunks in the mental lexicon gives learners the ability to extract the regularities of the linguistic system.

Wray’s (2002) collocation acquisition model. A different model of collocation acquisition was offered by Wray (2002), who argued for the holistic storage and processing of multi-words units in the process of their acquisition. In his view, segmenting multi-word units into their constituents is done when there is need to do so. This “needs-only principle”, according to Wray, leads to the creation of formulaic language. From this perspective, children segment sequences when they need them in social communication, which means that pragmatic concerns play a

crucial role in the segmentation process. Therefore, rather than instinctively breaking up multi-words into their smallest constituents to enhance their grammatical and lexical acquisition, children operate through a need for communication. Children maintain many multi-word units in their mental lexicon, even though each component of these units is stored individually, suggesting that dual storage is possible. However, in spite of a large number of studies on collocation acquisition, there is no evidence for storage of collocations as a whole in the mental lexicon (Schmitt, 2014). Yet, expressing the importance of need for analyzing the available input for the purpose of functioning in a language, Wray (2002) cautiously points out that in addition to the need to use these sequences, children must be equipped with the analytic knowledge and grammar insights that are developed over time.

This model also suggests that the proportion of holistic and analytic processing changes as children get older and identifies four stages of development, from babyhood to adulthood, during which children adopt holistic or analytic processes differently. While in the early phases of the first stage (from birth to 20 months), infants seem to operate holistically; in later months, they imitate the utterances they hear from their caregivers, which are considered to be “single unanalyzed units” *(p. 133*). In the second stage (20 to 30 months), grammatical knowledge becomes functional, enabling them to identify segments of the words that are acquired in social interaction. In the third stage, (8 to 18 years), a large number of collocations can be observed in their production; holistic and analytic processing becomes similar in the final stage.

In the course of development of formulaic sequences in L2 learners, the case is observed to be different. This model implies that, unlike first language acquisition, in which multi-words units are stored holistically, L2 learners do not retain information about which words co-occur together. Rather, they store each constituent of the collocations separately, which is thought to be due to lack of sufficient input. For example, when an L1 speaker of a language encounters a multi-word unit, this unit is stored as a word combination, which indicates these two words can come together. However, in the case of L2 learners, each constituent of the collocation is stored separately, as L2 learners are unaware of the fact that these words can come together. Therefore, according to Wray (2002), when they need to

use the collocation, they are unlikely to remember the correct combination. However, this claim has been refuted by the study of Durrant and Schmitt (2010) who found that adult learners could remember collocates of words after they encountered the target collocations.

In sum, models proposed for collocation acquisition provide limited information on the exact nature of the process of acquiring them. More detailed studies must be conducted to develop better insights into the phases of collocation learning in foreign language learning contexts.

Collocation Instruction

The Lexical Approach, introduced by Lewis in 1993, signaled growing attention to vocabulary in language instruction. This approach holds that "the building blocks of language communication teaching are not grammar, functions, notions or some other units of planning and teaching, but lexis" (Richards & Rogers, 2001, p. 132). The Lexical Approach highlights the importance of vocabulary and is characterized by the teaching of chunks, minimal pairs, lexical units and collocations, considering that the path for language learning and communication is not shaped by grammar, functions or units of planning, but by teaching lexis with the help of chunks and collocations. From this perspective, apart from the learning of single words, the learning of word combinations has also attracted attention, and several studies have revealed that multi-word combinations are used more frequently than single words (Altenberg & Granger, 2001; McCarthy & O'Dell, 2017). The notion of multi-word combinations, including fixed expressions, phraseological units, lexical phrases, routines, lexical bundles, prefabricated patterns, chunks, and collocations have been studied by numerous researchers (e.g., Bishop, 2004; Boers, Dang, & Strong, 2017Chan & Liou, 2005; Durrant & Schmitt, 2010)

Among all of these word combinations, the focus of this study is on co-occurrence of words. Some factors that need to be mentioned in collocation learning are outlined below:

Input. Learning or acquisition of lexical items is a gradual process which requires repeated exposure (Nation, 2001; Schmitt, 2010). A very large amount of input is suggested in SLA research for successful lexical acquisition (Krashen, 1985;

Ohta; 2000), and this applies to learning multi-word units, as well. In this regard, insufficient input may be one possible explanation for learners' failure to acquire these units, since specific classes of formulaic language are generally left out of materials used for L2 learners, which in turn results in less exposure and lower retention (Irujo ,1986). Siyanova and Schmitt (2004) expand on this idea, revealing that the frequency of exposure to collocations remained to be too low for L2 learners to improve their collocation production even when they are in a native speaking environment. Yet, although the importance of input has been highlighted, Carroll (2001) claims that the necessary amount of input for collocation acquisition has not been resolved. Therefore, supplementary L2 classroom materials should be provided to increase learners' engagement with collocations.

Collocation Exercises. The most commonly used classroom materials in L2 contexts are textbooks that contain exercises focusing on collocations. These exercises are generally written in different formats, such as various matching exercise and gap filling types, which are considered to prompt learners' engagement and increase the likelihood of long-term retention (Boers, Dang, & Strong, 2017). A recent study by Boers, Demecheleer, Coxhead, and Webb (2014) investigated the effects of exercises on verb-noun collocations. They reported results from four small-scale trials in which collocations were presented in two ways: (1) a matching format asking learners to match the words with their correct constituents; and (2) an exercise presenting the collocations as intact wholes. In the case of erroneous matching, learners were provided with corrective feedback to hinder undesirable word connections in their memories. The pre-test and post-test gains were found to be small, and it was determined that in the matching exercises, the participants made wrong matches. Thus, the participants who received collocations as intact wholes performed better than those who were asked to match the words with their constituents. In line with this study, Durrant and Schmitt (2010) found that presenting collocations as holistic units was more helpful. Therefore, instead of breaking up collocations and asking learners reassemble them, providing learners with holistic units may be a beneficial application in collocation teaching. In this regard, the current study presented the participants with whole, intact collocations with all three conditions.

The frequency and the quality of encounters. Another factor that explains the acquisition of the collocations is the frequency of encounters, as collocation pairs with higher frequencies were found to be used more by nonnative speakers (Durrant & Schmitt, 2009). The positive contribution of multiple encounters was also highlighted by Stahl (2005), who argued that it is necessary for learners of a language to see how words are used in different contexts. Similarly, Hill (2000) claimed that an effective way of learning collocation patterns is to observe vast amounts of recurring patterns of concrete examples in different contexts; the benefits of frequency of encounters has been highlighted by many other studies (Waring & Takaki, 2003; Webb, 2007, Webb, Newton, & Chang, 2012). In addition to frequency, the quality of an encounter has also been stressed, as studies indicate that learners' engagement with new words increases the likelihood of acquiring collocations. That is, the more learners are involved in collocation exercises, the higher their learning and retention (Hulstijn & Laufer, 2001; Laufer & Rozovski-Roitblat, 2011; Peters, 2014).

In summary, increased attention has been given to collocation instruction since the essential place of multi-word units in a foreign language has been noted, which in turn has resulted in a recent effort to develop better insights into collocation teaching and learning. In this regard, studies have shown that learners' awareness of collocations needs to be increased through different instructional approaches, and the amount of input, exercise types, and the frequency and quality of an encounter are found to be among the factors that affect collocation learning.

Verb-Noun and Adjective-Noun Collocations

Previous collocation studies exploring the collocational performances of L2 learners by comparing native and nonnative speaker performance revealed not only insufficient collocation usage by nonnative speakers, but also overused, underused and misused collocation combinations (Ädel & Erman, 2012; Durrant & Schmitt, 2009; Laufer & Waldman, 2011). The reason for this issue is considered to be the smaller number of precast terms at the disposal of nonnative speakers (Cobb, 2003), which results in the continuous use of fixed phrases or specific expressions. Supporting the view of Cobb (2003), Laufer and Waldman (2011) found that L2

learners' production of verb-noun collocations was far lower (5.9%) than that of native speakers' (10%). In the same vein, Howarth's (1998a) study found that native speakers use more verb-noun collocations in their writing than their nonnative counterparts.

Taken together, findings of these studies point to important collocational usage problems. However, such problems are the natural result of language acquisition, as the interlanguage of L2 learners develops gradually. Thus, with respect to L2 pedagogy, the central focus must be on the most problematic collocation combinations or difficulties confronted while learning collocations.

With regard to collocational problems exhibited by L2 learners, Nesselhauf (2005) investigated the verb-noun collocation usage of advanced level German learners of English in a corpus compiled from their writing. She found that nearly one third of the verb-noun collocations the participants produced was unacceptable or questionable and concluded that the selection of correct verbs in verb-noun collocations was problematic among advanced learners. This finding was also supported by Laufer and Waldman's (2011) study, which revealed that learners' production of erroneous verb-noun collocations was present among learners at three proficiency levels.

Various studies have also attempted to investigate L2 learners' use of different types of collocations, such as verb-noun, adjective-noun, and so on, to reveal whether one type of collocation poses more problems than others. In this respect, Gitsaki (1999) presented the acquisition order for the types of collocations, stating that adjective-noun collocations are acquired earlier and more easily, while verb-noun collocations are more difficult and acquired later. The problems encountered with the use of verb-noun collocations by L2 learners may be evidence of this determined order. Another study supporting Gitsaki's (1999) order comes from Siyanova and Schmitt (2008), who revealed that most of the adjective-noun collocations produced by Russian learners of English were appropriate.

The relatively better performance of L2 learners with respect to some types of collocations may be explained by arbitrary restrictions in the word combinations. That is, the degree of restriction plays an essential role in learners' correct production of collocations. Nesselhauf's (2003) study, for instance, revealed that

restricted verb-noun collocations whose word combinations were not open to many options were less prone to errors than those that take on a wider range of nouns.

The influence of L1 has also been investigated, with findings showing that L1 is a strong predictor of learners' collocational errors. Shehata (2008), for example, observed L1 related verb-noun collocation errors in the production of Arabic learners of English. Similarly, Laufer and Waldman (2011) found L1-induced errors with both intermediate and advanced learners, indicating that learners tend to overuse collocations that are congruent and underuse those that are incongruent.

Research into the acquisition of collocations have not gone far beyond identifying certain problems. However, there have been some attempts to devise appropriate methodologies to teach collocations more effectively. Some of these studies are shared in the next section.

Previous Intervention Studies on Explicit Teaching of Collocations

Regardless of the proficiency level of learners, collocation errors have been found to be most common among second language learners (Gui & Yang, 2002; McAlpine & Myles, 2003; Nesselhauf, 2003). Therefore, a considerable number of studies have been conducted to probe into learners' collocational competence, and pedagogical interventions for helping learners in the acquisition process have been noted in the literature. Some studies have shown that learners' attention to collocational relationships is weak, which results in regarding these units as compositional combinations, rather than seeing them as a phenomenon of co-selection (Laufer & Waldman, 2011; Wray, 2002). Therefore, numerous studies have been on collocation instruction. Boers and Lindstormberg (2012) divided these studies into three categories in their review of research on formulaic sequences. These headings are Awareness-Raising and Attention-Directing Studies, Stimulating Lookups to Foster Learner Autonomy, and Stimulating Retention.

Awareness-raising and attention-directing. The positive impact of attention in second language learning has been highlighted through research findings. (Izumi, 2000, 2002; Schmidt, 1990, 2001). Therefore, Schmidt (1990) proposed the "Noticing Hypothesis," which holds that "noticing is the necessary and sufficient condition for the conversion of input to intake for learning" (p. 17). Hulstijn

and Laufer (2001), moreover, claimed that “retention of new information depends on the amount and the quality of attention that individuals pay to various aspects of words” (p. 541). In the light of the findings on significance of attention in language classes, researchers have begun to explore how learners’ attention can adequately be attracted to both linguistic form and meaning simultaneously. Among several approaches proposed, typographical input enhancement, which is used to direct learners’ attention to target input to promote learning, has been a focal point in the field of second language teaching. Making unknown items physically salient by highlighting the target items can increase the amount and rate of noticing.

As classroom time is generally too limited to explicitly teach vast numbers of formulaic word strings, learners’ awareness of ubiquity of formulaic language should be raised (Boers & Lindstormberg 2012). Therefore, some researchers have focused on attention-raising activities to foster the learning of these sequences. For instance, Tseng (2002) investigated the effects of explicit collocation instruction on the collocational competence of 94 senior high school students in Taiwan. Unlike the control group, the participants in the experimental group received 12 weeks of explicit collocation instruction. The study revealed that collocation instruction helped the experimental group far exceed the control group on the post-test, regardless of their prior collocation levels. Similarly, Hsu’s (2002) qualitative study examining the impact of collocation instruction on Taiwanese EFL learners’ collocational competence showed that emphasis on the part of teachers on collocations helped students improve their collocation knowledge. Likewise, Boers, et al. (2006) conducted a small scale experiment to investigate the effects of use of formulaic sequences, especially collocations and idiomatic expressions, on learners’ speaking proficiency, as well as the impact of an instructional method emphasizing “noticing” these sequences on learners’ linguistic repertoire. In their study, 32 participants majoring in English were exposed to a great number of authentic listening and reading materials. During this exposure, the experimental group were informed about the standardized word combinations, while the control group received traditional grammar-lexis instruction. Afterward, two blind judges evaluated the oral proficiency of the participants, revealing that the experimental group was found to be more proficient than the control group. Their study showed that helping learners improve their repertoire of formulaic sequences can contribute to their oral

proficiency. In an earlier study, Wood (2012) investigated the effects of focused instruction of formulaic sequences and fluency on the oral proficiency of Japanese learners of English. The participants were asked to produce narratives before and after six weeks of fluency workshops consisting of 90 minutes per week, for a total of nine hours over six weeks. The activities in the workshop were sequenced according to existing literature on noticing, automatization and memorization, use of a native speaker model, and student ethnographers. After drawing the attention of the participants to the formulaic sequences in each series thorough the workshops, the spontaneous monologues of the participants were analyzed for temporal measures of fluency. The speech rate (SR) of the participants was measured by syllables uttered per minute, and the mean length of runs (MLR) were measured by mean number of syllables uttered between hesitations. The results indicated that focused instruction in formulaic sequences aided learner development of the use of formulaic sequences.

In another small-scale study, Peters (2012) investigated the possible effects of directing learners' attention to formulaic sequences in a text and on typographic salience (bold and underlined) on foreign language learners' retention of these sequences and of single words. The participants were 28 foreign language learners who were asked to read a glossed German text under two conditions. The experimental group was expected to pay attention to both formulaic sequences and single words during reading tasks and to write down unknown vocabulary, while the control group, making no reference to formulaic sequences, was only instructed to read the text and write down new and unfamiliar vocabulary on their task sheet. The researchers divided the target items into 12 single words and 12 formulaic sequences. Half of these words and sequences were printed in bold face and underlined to make them more salient. The study revealed that typographic salience seemed to effect learning formulaic sequences in a positive way, which may show that typographic salience plays a facilitating role in the noticing and learning of unknown lexical items.

Another study by Jones and Haywood (2004) focused on the effects of an instructional method on learners' acquisition of formulaic sequences in an English for Academic Purposes context. Two groups of the participants went through the same syllabus during a 10-week EAP course. While the participants in the

experimental group received training in formulaic sequences, the control group did not. The treatment consisted of reading and writing components in which the focus was on awareness raising exercises. The results of the study suggested that the participants in the experimental group appeared to have increased awareness of formulaic sequences, but their improvement remained modest. Additionally, no increased use of formulaic sequences was found in their writing.

The study by Laufer and Girsai (2008), moreover, investigated the instructional effects of explicit contrastive analysis and translation activities on incidental acquisition of single words and collocations. The participants were three groups of high school students with the same L1 background and with similar L2 proficiency levels in English. Each group received a different instruction: meaning focused instruction, non-contrastive form-focused instruction, and contrastive analysis and translation. The first group was taught ten unfamiliar words and ten collocations in L2 through content-oriented tasks requiring no attention to the target items. The second group performed text-based vocabulary tasks by focusing on the target items, while the third group received text-based translation tasks: from L2 into L1 and from L1 into L2. The time allocated for the activities in the three groups was kept constant. Active recall and passive recall tests were administered, and the test was repeated again a week later. The study revealed that the contrastive analysis and translation group significantly outperformed the other groups on the tests, which suggests that contrastive form-focused instruction facilitates acquisition of single words, as well as collocations, as it raises awareness of interlingual difficulties and engages learners by involving them in tasks.

Koç (2006), on the other hand, investigated the effects of explicit collocation instruction on participants' lexical collocation awareness. Her study also aimed to determine whether these instructions facilitated retention of newly learned vocabulary. A total of 160 upper-intermediate proficiency level Turkish EFL students participated in the study. The participants were divided into 8 intact groups: 4 of them were experimental groups and 4 were control groups. The experimental group received vocabulary instruction focusing specifically on collocations, while the control group focused on single words. To obtain the results of the instruction, a vocabulary retention test was administered as a pre-and post-test. Additionally, in the treatment sessions, three tasks, transcription of verbal processes and

retrospective interviews were used as data collection instruments. The study showed that the experimental group outperformed the control group in terms of retention; the results also showed that the participants developed awareness to the extent that they could identify collocations in any text.

Stimulating lookups through dictionaries. Laufer (2011) aimed to answer whether dictionary lookups foster collocation retention by conducting a study with 95 high school learners of English. The study was conducted in three phases. In the first phase, to examine learners' knowledge of collocations, a pre-test was administered. The participants received fifteen sentences, each of which contained one target collocation and were asked to fill in the missing verb without any dictionary assistance in the initial stage but later they were allowed to use dictionary. The translation of the target collocation was also provided at the end of the sentence, and the participants were asked to fill in the blanks with the correct translation of a Hebrew or Arabic verb. In the second phase, the participants were provided with clean sheets with sentences similar to those in Phase 1 immediately after the first phase. Besides these clean sheets, they were also provided with photocopies of the dictionary entries of the target nouns that were the headwords of the collocations. The participants were expected to use three dictionary entries to find each of the nouns: an English- Hebrew dictionary, LDOCE, and either COBUILD, OALD, or CALD. They were also asked to report in which dictionary they found each verb. In the third phase, the researcher investigated the retention of the target collocations by administering a test a week later without informing the participants beforehand. On the test, the L1 translation of the target collocations were given, and the participants were asked to provide the English translations. The results of the tests showed that there was a significant increase in correct answers in the second phase, which was attributed to the use of the dictionary. All the participants reported to find entries in LDOCE, which included 80% of the collocations that they were required to use in the exercise.

In a further study, Nesselhauf (2005), investigated the effect of using a dictionary in written production of the learners in terms of using collocations. She compiled a learner corpus to observe how learners use idiosyncratic collocations in their writing. The study revealed that similar number of collocational errors between learners consulting to a dictionary and those writing without dictionary. The study

has suggested that learners do not necessarily seek information on the use of collocations by consulting dictionaries.

Moreover, Laufer and Hill's (2000) study aimed to find the relationship between looking up new words and their retention. The study was conducted with 72 participants in three stages: pre-test, tutorial, and vocabulary retention test. In the pretest stage, to be sure that the target items were unknown on the part of the participants, they were asked to log in to a computer program and write the meanings of the L2 target words they saw on the screen. Those who reported knowing more than one of the target words were eliminated from the sample. In the tutorial stage, the participants received a second screen showing a reding text in which 12 target collocations were highlighted. In the course of reading, the participants were allowed to look up the meaning of the target collocation by clicking on it with the mouse. As the highlighted collocations were relevant to text comprehension, the participants were motivated to find their meaning. After they completed the task, they were unexpectedly tested on meaning recall of the target words. The recall data were analyzed with ANOVAs, repeated measures, and correlations to see the possible relationship between retention and lookup behavior. The results of the study revealed that lookup preferences differed from person to person, but that use of information from multiple dictionaries facilitates retention.

Dziemianko's (2010) research, on the other hand, aimed to investigate which form of monolingual English learners' dictionary (electronic or paper) was more useful in receptive and productive tasks. The study also sought determine which format has a more crucial role in retention of meaning and of collocations. The dictionary used in the study was COBUILD6 (2008). The participants were upper-intermediate and advanced students who received a pre-test consisting of two tasks, receptive and productive, for eighteen expressions. Nine of these expressions required the participants to show their knowledge of meaning, while the other nine expressions required the participants to supply a blanked-out preposition. The same test was readministered, this time asking the participants to consult the dictionary. To complete each task, thirty participants used a paper version, and thirty-four participants used the e-version of Collins COBUILD Advanced Learner's English Dictionary. After two weeks, the test was administered again unannounced, but this time, they did not use either version of the dictionary. The study revealed that the

eversion of the dictionary was more useful for both the second and the third task. That is, the participants using the eversion of the dictionary answered significantly more items correctly on both sections of the test.

Stimulating lookups through corpus concordance. Collections of electronic data for the purpose of linguistic analysis and research has led to the emergence of new field of research called corpus linguistics, which is defined as "the empirical study of language relying on computer-assisted techniques to analyze large, principled databases of naturally occurring language" (Biber &Conrad, 2001, p. 548). This new field of research, which has the potential to yield highly fundamental insights about language, is a methodology on the basis of carrying out linguistic analyses through electronically collected written and transcribed texts called "corpora" (singular "corpus"). O'Kafee, McCarthy, and Carter (2007) broadly define a corpus as "a collection of texts, written or spoken, which is stored on a computer" (p. 1). Stimulating lookups can also be achieved through direct corpus evidence. Learners can take advantage of compiled corpus by consulting them to learn or to raise their awareness on the conventionality of a given word string or to try to grasp the meaning of the target item by reading it in context. For instance, they can test whether certain word combinations are formulaic through concordancing, which provides learners with a list of word combinations, starting from the strongest collocates to the weakest.

As the analysis of such a huge amount of data would be impossible without the use of tools, corpus tools have gained widespread use for analyzing a large number of written or transcribed texts, with the aim of developing better insights on the linguistic features of the corpus under analysis. One of the most-used tools for corpus analysis is concordancing. According to a definition provided by Lindquist (2009), a concordance is "a list of all the context in which a word occurs in a particular text" (p. 5). O' Kafee et al. (2007) describe concordances as follows:

> The search word or phrase is often referred to as the "node", and concordance lines are usually presented with the node word/phrase in the center of the line with seven or eight words presented at either side. These are known as Key-Word-In-Context displays (or KWIC concordances). Concordance lines are usually scanned vertically at first glance; that is,

looked at up or down the central pattern, along the line of the node word or phrase (p. 8).

Concordance displays can also be used to extract information on collocations patterns and word clusters. They give information on how words combine with each other in their co-text. Such programs offer opportunities for learners to encounter many examples of a key word or phrase, allowing them to examine usable concentrated data (Chan & Liu, 2005). Therefore, a promising future has been seen in concordancing in the field of language teaching and learning, permitting learners both to discover patterns and to adjust their misconceptions through observing a huge amount of authentic data (Hill, 2000).

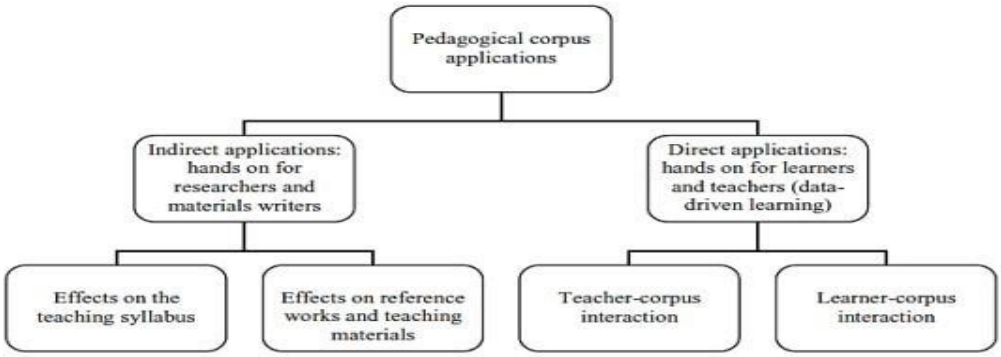
With the integration of corpus technology in the form of electronically compiled written and spoken texts, which have served as a valuable open source for many language studies, scholars have had opportunities to see how language works and how the mechanics of the language offer insights into creative studies in the field (O'Keeffe et al., 2007). Corpus studies offering new ways to detect the unique characteristics of a target language have also been influential in the field of language learning and teaching, as the authentic nature of corpus has been highlighted as providing better implementations in language teaching situations (Johns, 1994). For the first time, researchers, teachers, and learners have found the opportunity to investigate very large collections of texts consisting of hundreds of millions of words to unveil facts about language, such as which words are most often used together, which grammatical patterns are associated with a given word, or which words are used most frequently (Ghadessy, Henry, & Reseberry, 2001). This process allows learners examine authentic patterns and adjust their misconceptions accordingly.

According to Hill (2000), the combination of corpora and concordances has been widely used in the field of language teaching and learning, and corpus research in language teaching and learning has increased in journals and volumes since the 1990s (McEnery & Xiao, 2011). The uses of corpora by learners have been summarized by Vettorel and Lopriore (2013) as follows:

> "(i)Study real language uses such as idioms, collocations, phrases etc., and compare observations and findings with language norms presented in

reference materials, (ii)Analyze their errors in learner corpora, (iii) Compare the uses of special and general language, (iv) Identify and understand the uses of spoken language and how it is different from written language, (v)By using bilingual corpora, contextualize translation tasks. Investigate discourse and language varieties as nonnative speakers use the potential of language awareness, (vi)Use the power of their first language to compare languages (p. 75)."

Two general approaches to the use of corpora in language studies have been adopted. The first is corpus analysis on the part of teachers, linguists or researchers



in order to develop language teaching materials depending on the authentic nature of the corpus; the second is corpus analysis on the part of learners to allow them to induce the patterns in the language by being exposed to variety of occurrences of the same structure in different contexts. Two ways of using corpus in classifying pedagogical applications have been illustrated by Römer (2011) (see below).

Figure 1. The use of corpora in second language learning and teaching (Römer, 2011)

The use of corpus research for the sake of producing materials and resources for learners and teachers is considered an indirect application of corpora (Römer, 2006). In such corpus studies, products have been given names such as "corpus-based materials" and "corpus informed materials." The distinction between these is that the former is produced by faithfully depending on what computers tell the teacher or researcher about the language use. The latter, on the other hand, is not necessarily produced by depending on the whole corpus but filtered according to set criteria that are useful for learners (McCarthy, 2008, p. 566). Corpus-based dictionaries can be counted as examples of direct application of corpora, and nearly, all well-known continuously developing dictionaries are on the basis of large corpora

(O'Keefe et al., 2007). Other applications of indirect use of corpora can also be found in the syllabus design and in the development of testing materials (Boulton, 2009).

In the direct application of corpora, learners are involved in the task of discovering language by inducing patterns and making generalizations from real life language samples via corpora (Bernadini, 2004). The options for using such direct applications have been shared by Tomlinson (2011). First, a teacher should choose some corpus samples in the form of concordance lines or frequency lists and provide students with these materials. Then, they should direct students' attention to the patterns by asking questions about the data sets given. Secondly, online corpora found on websites such as COCA, Time, MICASE and MICUSP may be used. Another option is to construct a specialized corpus for classroom use, through which teachers can offer students opportunities to use tools such as Antconc and Worthsmith, working on the pre-determined patterns by analyzing the concordance lines in the corpus.

The current study is concerned with the direct application of corpora through learner-corpus interaction. The benefits obtained from the corpus through such interaction are supported by many researchers. For example, Ljung (1990) showed that traditional textbooks or language teaching materials tend to over-present concrete words and ignore more abstract and societal terms; while Braun (2005) highlighted the importance of exposure to authentic language and language materials. Thus, corpora compiled with native speaker productions have been regarded as a tremendous for authentic language (Hill, 2000; Johns, 1994; O'Kafee, McCarthy, Carter (2007). Analyzing such corpora via a data-driven approach has been viewed as a good starting point in this process.

Moreover, the DDL studies in literature support the use of concordancing for effective learning. Concordancers are considered to be valuable tools to observe and examine collocations, which hold an important place in language learning and teaching (McEnery & Xiao, 2011). As such, the impact of learners' corpus concordancing on vocabulary learning has been investigated over the past two decades. Cobb's (1997) study, for example, compared the effectiveness of online concordance exercises with traditional vocabulary exercises. While the learners in the control group practiced vocabulary through online concordancing, the control group used a set of traditional vocabulary exercises. The study showed that online

concordance exercises were more effective for students' vocabulary learning than traditional exercises.

In later years, a broader perspective was adopted by Cobb (1997) who also examined receptive and productive knowledge of words in his study, investigating the instructional effects of learners' corpus consultation on gaining definitional knowledge of words. In his 12-week long study, the participants were asked to learn 200 words a week. They were assigned to two different groups. The experimental group studied the target words with a purpose-built corpus that was compiled from reading materials, while the control group worked with a word list and dictionary. The participants received a pretest, immediate post-test, and delayed post-test. The results of the study revealed that the two groups' immediate post-test scores on receptive tests did not differ significantly. However, it was found that the learning effect of the experimental group remained higher than the control group on the delayed post-test, indicating that receptive knowledge of words can be learned through exposure to concordances, wordlists or dictionaries; but it can be better retained by concordancing, which provides learners with deeper processing of the language input. As for the productive knowledge of the collocations that was measured by controlled productive tests, the outcome of the study showed that the experimental group's scores were significantly higher than those of the control group. This finding was presented with the claim that encountering words in varied situations with varied contexts facilitates successful learning, while word knowledge gained from dictionary consultancy cannot be transferred to active use, due to the fact that the level of knowledge remains inert (Cobb,1997). Cobb further suggested that both receptive and productive knowledge of the collocations can be facilitated through corpus concordancing, which enable learners observe the words in various context and situations.

These findings were supported by Jafarpour and Koosh (2006), who conducted a research study whose aim was threefold. The first aim was to determine whether concordancing materials presented through a data-driven learning approach affect the teaching/learning of collocations of propositions. The second aim was to examine the impact of proficiency level on the knowledge of collocations; and the final objective was to determine the extent to which learners' second language collocational knowledge is affected by their L1. In their study, 200

participants were randomly divided into two groups. In the first group, the participants were taught propositions and their collocational patterns in a conventional manner, while the second group applied a DDL approach, using concordancing to learn the same patterns. The results of the study showed that the DDL approach was effective in teaching and learning collocations of propositions. Moreover, learners' proficiency level and their collocation performance was positively correlated, and they tended to carry their L1 collocational patterns into their L2 production.

Kaur and Hegelheimer (2005), in selecting target academic words for eighteen intermediate level participants, investigated learners' free production of academic words specifically. The participants were randomly assigned to a an experimental or a control group. The experimental group was given access to a concordance, while the other group was only allowed to use a dictionary. The results of the study showed that the experimental group outperformed the control group in terms of using the target words significantly more correctly in a writing task, which suggested that dictionary consultancy was less useful in facilitating productive knowledge.

Another study on the instructional effects of corpus consultancy was conducted by Akıncı (2009), who aimed to determine the effectiveness of data-driven learning, explicit instruction, and combined methods in teaching verb-noun collocations. The study was carried out through measuring the recognition accuracy and judgment about the acceptability of collocations on the part of 58 participants who were first year students in an ELT department. The perceptions of the participants about the corpus consultancy were also investigated. The participants were divided into three groups. The first group was named the DDL group and included 20 participants who followed DDL instructions. The explicit instruction group included 19 participants, and the combined group, which included 19 participants, followed both DDL and explicit instruction. The researcher found that there was a statistically significant difference among the participants in terms of recognition accuracy of verb-noun collocations. While the explicit instruction group performed better than the data-driven group, there was no significant difference between the explicit and combined groups. The results also showed that the

participants found corpus consultancy more useful and effective in learning verb noun collocations.

In a further study, Rahimi and Momeni (2012) examined the effects of teaching collocations explicitly through concordance lines on learners' language proficiency. The study employed a pre-posttests design and sixty Iranian pre-university students majoring in the field of mathematical sciences participated in in the study. While the control group received and learned new collocations with translation and definition tasks, the experimental group participants learned the same items with corpus-based activities. The results of the study revealed that the experimental group outperformed the control group, implying that the language proficiency of learners can be facilitated by teaching collocations with concordancers. Sun and Wang (2003), moreover, investigated the relative effectiveness of inductive and deductive approaches to learning collocations, also through the use of a concordancer. They found that the inductive group, having more cognitive load, improved significantly more than the deductive group in the performance of collocation learning.

DDL and Paper-based Concordancing

The potential applications of electronic corpora through web-based concordancing may not always be accessible in language classes. In this respect, Farr (2008) explains that some teachers are concerned with class sessions in the computer room for variety of reasons, while Tian (2005) points out that teachers may not have regular access to computer laboratories or technical support. Such problems have led some researchers to investigate other DDL approaches that are easier for teachers to access and implement. For instance, in the light of the effectiveness of concordancing on vocabulary learning, the impact of paper based concordancing materials has been explored. A paper-based approach means that learners are working on printed concordance lines on paper, rather than on computer screens. Beforehand, their teachers search for the target words and provide the concordance lines to the students to examine; this approach is thought to be more readily understood and time efficient and does not require students to access to computers (Boulton, 2010).

In a recent study on this subject, Huang (2014) investigated whether and to what extent data-driven learning (DDL) activities affect lexico-grammatical use of abstract nouns in L2 writing. He compiled a topic-based corpus and taught learners concordancing through that corpus, dividing 40 Chinese students majoring in English into control and experimental groups randomly. The experimental group practiced the targeted abstract nouns with paper-based concordance lines, while the control group explored the same material using a dictionary. The results showed that the experimental group's papers contained a higher variety of collocational and colligational patterns and had fewer linguistic errors in using the target abstract nouns. It was also seen that the same group improved in noticing and using collocations in their writing. In a similar vein, pointing the out advantages of using printouts of concordances in his earlier study in 2008, Boulton (2010), taking the computer out of equation, investigated the effect of paper-based concordance materials in vocabulary learning for low-proficiency English learners. He selected fifteen problematic target items from students' written production and distributed a set of paper-based concordance materials to the learners in the experimental group. The control group, on the other hand, received traditional dictionary-based materials. The results of the study showed that corpus-based exercises helped students learn the target words more efficiently than the traditional learning materials.

As teachers provide learners with only the targeted vocabulary items in paper concordancing, some researchers have made counter-arguments on the nature of DDL, which is considered to make learners more independent by allowing them to analyze all choices and make generalizations from the language use. However, Kirschner et al. (2006) claims that beginner learners or learners with lower aptitude may fail to learn effectively from an inductive approach, implying that paper based DDL materials are more appropriate for learners of these groups (as cited in Boulton, 2010, P.538)

Turnbull & Burston (1998) is quoted in Boulton (2010, p.12) suggesting that learners need to be introduced to inductive learning strategies with a gradual introduction to concordance work, and they need to receive extensive guidance in using these strategies so that they can progress at their own pace while making their independent queries.

Overall, DDL studies have been proven to facilitate vocabulary learning. However, very few studies have compared the effectiveness of web-based and paper based concordancing on learners' collocation knowledge (Boulton, 2010). Therefore, the present study aims to compare these two approaches in terms of how they impact students' receptive and productive collocation knowledge.

Parallel Texts

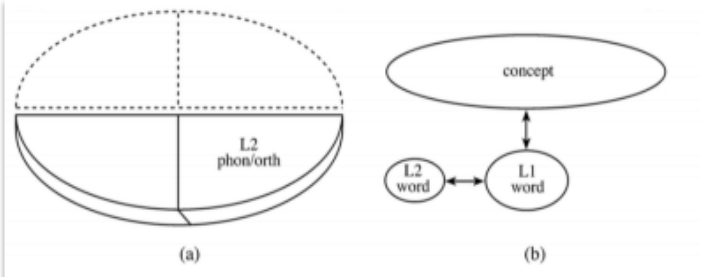
With respect to parallel texts, Hartman (1994) gave a widely accepted definition, explaining them as corresponding original texts in different languages. The importance of such texts has been emphasized, as they offer valuable information on the intra- and interlingual dimensions of two languages. Widely used in translation studies, the notion of "comparability" between texts is considered to be the main attraction to researchers; the linguistic and interlingual comparisons have made them the object of systematic analysis. In computational linguistics, for example, the term "parallel" has been used for an original text and its translation (Peters, Picchi, & Biagini 1996). As such, parallel text corpora consist of two texts: one original source text and its translation. The present study takes this approach, viewing parallel texts as an original text and its translation.

Very often, dictionaries or glossaries offering variety of sources may not provide sufficient guidance to find the exact meaning of multi-word units or expressions in the target language. Learners may feel frustrated when there are ambiguities among a variety of choices when they need to understand or learn these multi-word units, which are considered to be one of the difficult aspects of vocabulary learning. Thus, these parallel texts can be a major help, as they provide learners with context in which the units are clarified by the surrounding words.

The compilation of parallel texts with the aid of computer tools has brought about the concept of bilingual corpora, also referred to as multilingual corpora, translation corpora, comparable corpora, or equivalent corpora. Although these terms can be used interchangeably, McEnery and Xiao's (2008) distinction make it clear. They have explained that translation corpora can be counted as an umbrella

term with three categories: parallel corpora, comparable corpora, and equivalent corpora. While parallel corpora are composed of source texts and their translations, comparable corpora consist of monolingual sub-corpora, which use the same sampling frame composed of similar texts in two or more languages. The combination of parallel corpora and comparable corpora yields equivalent corpora. The distinction between multilingual and bilingual corpora is made on the basis of the number of languages involved.

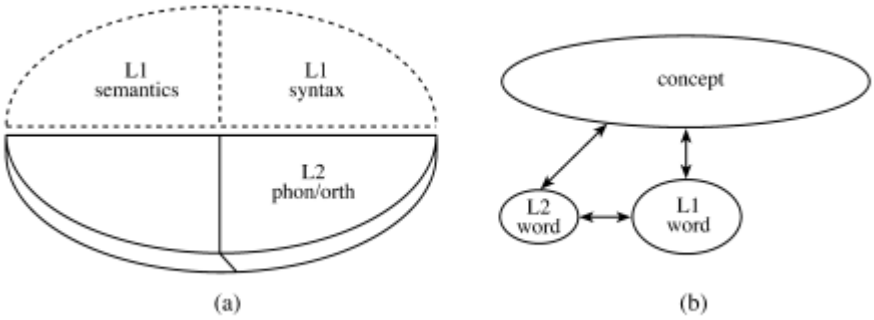
The untapped potential of parallel corpora has been recognized when the possible effects of encountering two languages have been researched. For example, as it differs significantly from acquisition of L1 words, L2 lexical development is claimed by Jiang (2000) to have two constraints, especially when it is taught in classrooms. The first is the limited exposure to the L2, which limits learners' ability to extract and create semantic, syntactic, and morphological information for a target word and integrate it in the lexical entry of that word. The second constraint is the existence of an established lexical system in the L1, on which learners of a second language, especially adult learners, may heavily rely when they are directed to find L1 translations. This may make learners less motivated to pay attention to forming their own second lexical system (Jiang 2000). Thus, the theoretical framework for the effectiveness of encountering parallel texts can be explained by Jiang's (2000) "Lexical Representation and L2 Development Model," which explains how a specific L2 word evolves in the learning process. This model holds that in the first phase of lexical progress, stimulation of the associations between L2 words and their L1 counterparts is required. That is, when an unknown word is heard, its L1 meaning counterpart becomes accessible, and comprehension becomes complete (see Figure 2 for an illustration).



*Taken from Jiang (2000)

Figure 2. Lexical representation (a) and Processing (b) at the Initial Stage of Lexical Development in L2

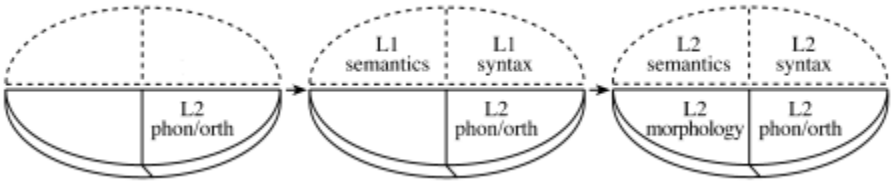
In the second phase, the more one gains experience with L2 words, the stronger the link between them and their L1 counterparts becomes, which in turn results in dual activation of word forms and lemma information simultaneously. See Figure 3 for an illustration.



*Taken from Jiang (2000)

Figure 3. Lexical Representation (a) and Processing (b) in L2 at the Second Stage

In the third phase, the lexical entries of L2 and L1 are almost alike in terms of semantic, syntactic, morphological, as well as formal specifications about the target word. Figure 3 illustrates this overall L2 lexical development.



*Taken from Jiang (2000)

Figure 4. Lexical Development in L2: From the More Formal Stage to the Integration Stage

Therefore, depending on the model explained above, exposure to parallel texts has been considered to stimulate L2 collocational development in a more effective way, where learners are provided with the L1 counterpart of the target collocations in its own Turkish context along with the L2 contexts. In this manner, learners are not faced with frustrations while searching for the meanings of

collocations; moreover, they may become certain about the meaning of the target collocations. In terms of this model, another advantage of parallel texts is that they provide instances of collocations used in both English and Turkish context, which aids development of syntactic, semantic and pragmatic information that is needed for lexical development in L2. Therefore, the focus in this paper, within the framework of bilingualism, is to address the benefits of bilingual paper-based corpus integration in the second language classroom, using parallel texts as a distinctive approach to teach collocations.

Parallel corpus technology has generally been used in translation and comparative language research, but there are also a limited number of research studies touching on its pedagogical applications in second language classrooms, as well as the need for additional classroom applications (Chan & Liou, 2005; Fan & Xu, 2002; Tsai & Choi, 2005)

In this regard, Tsai and Choi (2005) conducted an experimental study to explore the lexical acquisition and retention of American learners of Chinese. The experimental group consulted to parallel corpus concordances to practice new lexical items while the control group used a traditional approach, dictionaries, to learn the same target words. The results of their study showed that the corpus-based group had a greater observed level of acquisition and retention when the pre- and post-test results of both groups were compared.

Chan and Liou (2005), moreover, investigated the influence of using web-based practice units on improving the collocational knowledge of learners with the design of web-based Chinese-English bilingual concordances. The participants in their study were 32 college EFL students who received a pre-test and two post-tests, as well as a background questionnaire. The researchers designed five web-based units consisting of a semantic grid analysis, a bilingual concordancer, and interactive exercises with voice readings of online information. Three units were taught through the use of a bilingual concordancer, and two were taught without it. The participants were asked to consult the most suitable verb collocates while doing the online units by using a web-based bilingual concordance. In the other two units, the participants were taught by pattern explanations only, without consulting the bilingual concordancer. The results of the study indicated that the participants made significant collocation gains immediately after the online practice; however, the

delayed post-test results showed that they had regressed. However, the final scores of the participants were still better than their entry level, revealing that the bilingual concordancer helped them progress in learning the target items. Although the participants reported that they did not like the bilingual concordancer-aided collocation teaching as much, the results proved that their performance was better than the non-concordancing group.

Another study on the effectiveness of bilingual concordancers was conducted by Fan and Xu (2002), who asked their participants to use a Chinese/ English parallel corpus of legal documents to answer comprehension questions. In line with the findings of Tsai and Choi (2005) and Chan and Liou (2007), Chan and Liu (2007) were interested in seeing the influence of using five web-based practice units on English verb-noun collocations with the design of a web-based Chinese-English bilingual concordancer (keyword retrieval program) on collocation learning. Their results, taken from thirty-two college students, indicated that learners made significant collocation improvement immediately after the online practice but regressed later on. However, their final scores were still better than their entry level. The study showed that the participants both benefitted more from the bilingual concordancers than other means and preferred to use it more.

Adding to the literature on the use of parallel corpora in second language classroom settings, Xu and Kawecki (2005) explored the effectiveness of an aligned Chinese/English/French trilingual parallel corpus in a French foreign language class. The participants in the study were Chinese L1 learners who were highly proficient in L2 English. They were asked to use a corpus to derive both meaning and use of the target lexical items in French by comparing the French terms with their English and Chinese equivalents. They were also asked to contrast the form and function of the target words with the other two languages. The study revealed that the use of the trilingual corpus aided learners in expanding their knowledge of both L1 and L2 in the process of learning a third language. Therefore, the researchers concluded that the participants benefited from the trilingual parallel corpus, especially when they had difficulty in comprehending pragmatically and semantically challenging linguistic concepts.

Another encouraging study on the part of using parallel corpora was Gao's (2011) study, which revealed that a parallel corpus facilitates understanding and

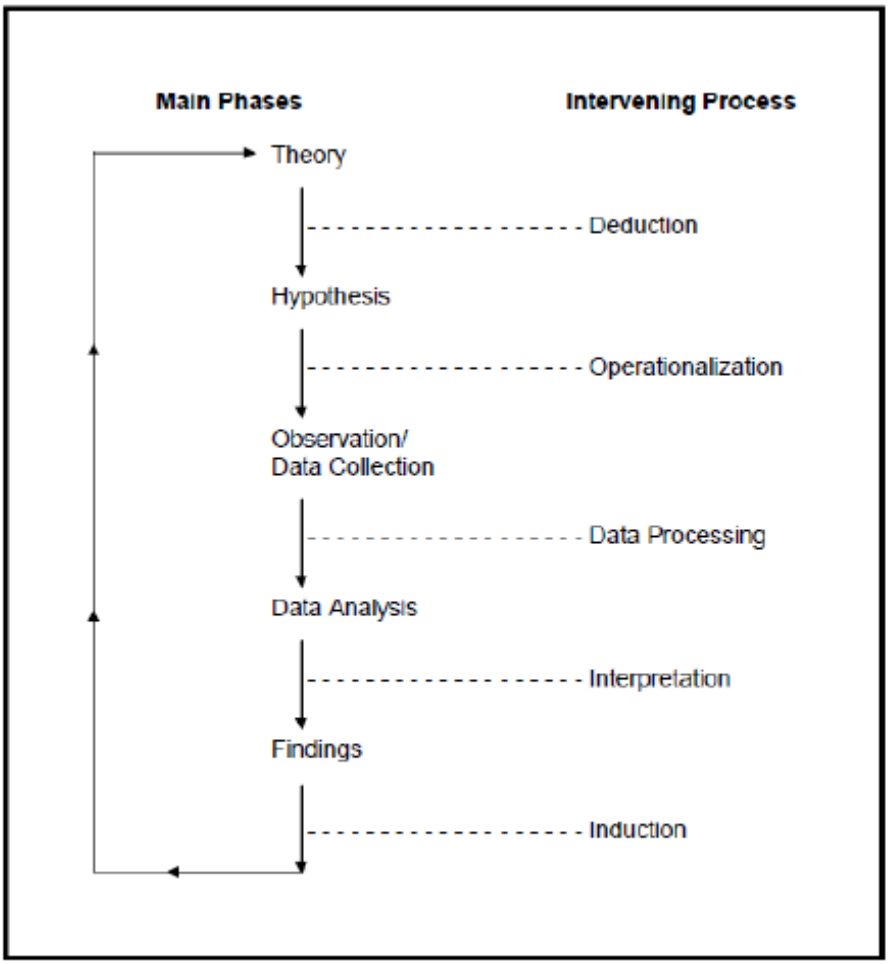
retrieval of unknown expressions by providing learners with target expressions and their equivalents in the mother tongue. In line with findings of the current study, Goa's (2001) research indicated significant gains when the pre-test and post-test scores were compared. More detailed analysis of his study showed that improvements in the post-test were on word choice and word combinations.

Chapter 3
Methodology

This study is composed of one pilot study and one main study. This chapter of the dissertation presents the research methodology that was followed in both aspects beginning with the research design. Then it presents the findings of the pilot study with the description of the participants and setting. After the pilot study is presented, the implications of the pilot study for the main study are discussed, which is followed by a presentation of the main study, with a detailed description of the participants, setting and instruments. Finally, the data collection, scoring and analysis procedures are explained.

The Nature of Quantitative Research

The research methodology employed in the current study is mainly a quantitative one that reduces the ideas into small sets such as variables in order to form hypotheses and research questions (Creswell, 2009). In such research, to verify the hypothesis, numerical measures of observations or the behaviors of individuals are taken, and the elicited data are analyzed through statistical method. The findings of such analysis have a potential to be reproduced and generalized beyond the context of the study. Quantitative study designs are considered to be specific and well structured; they have been tested for their validity and reliability; and their explicit definition and recognition is possible (Kumar, 2011). Quantitative research designs are structured, rigid, fixed, and predetermined, as they are expected to ensure accuracy in measurement and classification (Kumar, 2011). This type of research requires a formulation of a theory to be tested. To achieve this, researchers need to establish causal links between dependent and independent variables by manipulating independent variables and observing related changes (Bryman, 1989) (see Figure 5).



(Bryman, 1988, p.20)

Figure 5. The Logical Structure of Quantitative Research Process

Qualitative research methods, on the other hand, have been influenced by social constructivism (Creswell, 2009). The fundamental concentration in qualitative research is to understand, clarify, discover, and explain circumstances, emotions, perceptions, attitudes, values, beliefs, and experiences of a group of people. Therefore, the research designs in such methods are often on the basis of deductive instead of inductive rationale and are adaptable and emergent in nature (Kumar, 2011). Often flexible and evolving, the information gathering methods and processes are based on collecting data from the people through an open frame of enquiry, which helps researchers to develop a pattern of meaning or a theory through an inductive process (Creswell, 2009). In contrast to quantitative studies, the focus of these methods is not on generalization of findings to other contexts, but on explaining or describing cases depending on an individual or a group in a specific situation or context (Phakiti, 2014).

In spite of the differences between quantitative and qualitative methods, researchers may use both in a single study to add breadth and depth to the investigation. With this in mind, the data gathering method of the current study includes these two research paradigms, but the main focus is on quantitative methodology, since the aim was to explore the effectiveness of three different interventions on the receptive and productive collocational knowledge of the participants. The quantitative data drawn from the instruments was complemented by qualitative data gathered from open-ended perception questions concerning two interventions.

Study Design

The study adopts a quasi-experimental design, which is classified under experimental research because of its purpose to establish causal relationships between variables. Quasi-experimental designs are different from true experimental designs, as the selection of the samples is not achieved through random sampling due to factors such as institutional governing, ethical or practical concerns relating to language classes (Phakiti, 2014). Although the findings of such studies are usually considered to be suggestive and facilitative for more sophisticated, randomized experimental designs, there are some potential limitations, such as the characteristics of learners, time of day, and teachers, which make it difficult to draw causal-like inferences. However, in such designs, randomization of experimental conditions is also possible with intact classes, as the treatments were randomly assigned to classes; this may strengthen the validity of the research (Phakiti, 2014). This study used a “Pretest-post-test design,” which is among the most frequently used designs in language learning research. This design allows researchers to “measure change[s] in a situation, phenomenon, issue, problem or attitude,” (Kumar, 2011, p. 130), which is achieved by comparison of differences in phenomena or variables before and after an intervention The main advantage of this design is to assess the impact of the intervention by comparing differences of scores elicited before and after the intervention. In order to strengthen the causal links for the intervention and overcome criticism about controlling all variables that may affect the results, a control group is used (Kumar, 2011). In a study with a control group design, two comparable groups (control and experimental) are

selected on the basis of the similarity of their characteristics in every respect but for the intervention (which is thought to bring change on the basis of the treatment). This design may include more than two experimental groups, and a delayed post-test may be added according to purpose of the research questions. In this study, two experimental groups and one control group completed both a pre-test and a post-test to determine the level of their improvement in collocational knowledge. Additionally, the study also employed a delayed post-test, through which the retention of the receptive and productive knowledge of the collocations was measured.

The baseline established for the study was to learn 20 unknown target collocations in two sets that were selected on the basis of set criteria and verified with Paribakht and Welch's (1996) Vocabulary Knowledge Scale. Two different treatment models were introduced to two experimental groups, while the control group was asked to consult an online dictionary. After each treatment (learning 5 adjective-noun and five verb-noun collocations), the participants immediately took a post-test to reveal the effects of these treatment models and ascertain any change in the dependent variable. The relative effectiveness of these interventions was established depending on the degree of change in the receptive and productive knowledge of the target collocations.

The participants were randomly assigned to the groups, which ensured that all possible other variables were scattered among the groups, as one of the biggest problems encountered in such designs is the difficulty of ensuring that different groups are in fact comparable in every respect except the treatment. In this manner, the process of randomization strengthens the certainty that the groups are comparable (Kumar, 2011).

Threats to Internal Validity

With respect to threats to internal validity, the history threat refers to the possibility of attributing change in observed effects to extraneous or historical events, rather than to the intervention. This threat is controlled by an immediate post-test, which was applied with both the experimental groups and the control group. The target collocations were selected independently from the course

materials of the participants, and they were only revealed in the intervention processes. Furthermore, none of the participants were allowed to take note of them to eliminate the possibility of independent individual study after the immediate post-test.

Testing threat, on the other hand, refers to the effect of the pre-test on the participants' post-test performance. This did not constitute a threat for the current study, as the pre-test was administered a week before the interventions. This test included unknown collocation combinations, which were selected on the basis of the participants' answers to the Vocabulary Knowledge Scale. As for the delayed post-test, the participants were asked to retake all of the receptive and productive tests three weeks after the post-test. Over those three weeks, they did not receive any other intervention or test. Altogether there were three receptive tests for form, use and meaning, as well as a productive test, which constituted four tests in total.

To avoid another testing threat (the effect of the tests on each other), the participants first received the productive test, which asked them to write the missing parts of the collocations. Then, the receptive tests were given in the following order: first, the participants received receptive test for form, which asked for the spelling of the words in the collocations separately, so that they could show their knowledge of receptive form without being affected by any previous testing. Then, on the receptive test for use, they were asked to match words with the collocates. Lastly, they received the third receptive test that assessed whether they knew the meaning of the target collocations.

The Pilot Study

A small-scale pilot study was conducted prior to the main study to test whether the crucial components of the research were feasible, as well as to eliminate any potential problems before the main study. The pilot study offered opportunities to observe the data collection process and see the participants' attitudes towards the intervention, which in turn, informed any required adjustments to be implemented in the main study.

Setting and the participants. The study was conducted at the Ankara Yıldırım Beyazıt University School of Foreign Languages in the Fall term of the 2018-2019 academic year. The mission of the school of foreign languages is to improve students' overall English skills to enable them use English effectively in their 100% English medium academic and professional lives. In this respect, the curriculum of Ankara Yıldırım Beyazıt University School of Foreign languages is designed to cover all skills in English. The academic year comprises four quarters, during each of which students take 7 weeks of English courses. In total, students take 28 weeks of intensive English courses, 24 hours a week. These courses are offered to students in an integrated way through a main course, as well as courses addressing specific skills such as listening and speaking, reading, and writing. Students are assessed both formatively and summatively. In each term, they are expected to take three main course tests and five pop quizzes, as well as giving two speaking presentations and keeping a writing portfolio. They are expected to achieve at least 70 points out of 100 on a proficiency test to pass the preparatory class. The school designates the proficiency levels in accordance with the Common European Framework of Reference for Languages (CEFR), ranging from A1 to C2+ (A1, A2, B1, B1+, B2, B2+, C1, C1+, C2 and C2+). The students are placed in each level according to a placement test that is conducted at the beginning of the academic year.

The participants in the study were 22 B1+ level students whose age ranged from 18-23 and who were responsible for compulsory foreign language education. The sampling procedure used by the researcher was purposive, which is a type of non-probability sampling method that depends on selection of participants according to given criteria. The reason for choosing the participants at this level was that the learners were thought to have enough of a command of the English language to be able to succeed in the interventions. Due to the fact that the participants received the treatment and took the required tests over 3 successive weeks, those who missed even one class hour were excluded from the study. Therefore, the number of participants in the Corpus Group was 17, which was reduced to 8 after all tests; the Number of the participants in the Parallel Texts Group was 15, which was reduced to 7. The number of the participants in the Control Group

was 15, which was also reduced to 7. See Table 3 for a description of the demographics of the participants.

Table 3

Demographic Information of the Participants in the Pilot Study

Variables		N	%
Age	18	6	% 27.27
	19	8	% 36.36
	20	4	% 18.18
	21	2	% 9.09
	22	2	% 9.09
	Total	22	
Gender	Male	14	% 63.3
	Female	8	% 36.7
	Total	22	
Department	Electrical and Electronic Engineering	15	% 68.18
	Mechanical Engineering	7	% 31.81
	Total	22	

Data collection for the pilot study. The data were collected during the regular class meetings. An Informed Consent Form was presented, and the aim of the study was briefly explained to the participants. Afterward, the Vocabulary Size Test (Nation & Beglar, 2007) was used to test the participants' word frequency levels to select the target collocations for the study. The time allocated for this test was 45 minutes. The vocabulary size of the participants was found to be between 3000 and 4000 bands. Both elements of a collocation, i.e., the verb and the noun, were selected from the same or a higher frequency band. For example, a noun from 3K (the second 1,000 most frequent word families) was paired with a verb from either 3K or 4K. The minimum frequency of the collocations in the COCA corpus was 50 (as with Nguyen and Webb (2017), who set the minimum frequency in their study as 50). The MI scores of the target collocations were set to be 3.0 or higher, which indicates that a word pair is a collocation (Durrant & Doherty, 2010). After giving attention to the frequency level and MI scores of the target collocations, for the productive writing assignment (entitled "The Person you Admire"), another careful selection of collocations was made to enable the participants to use the collocations

in their writing. To avoid choosing known collocations for the study, all of the participants were given the Vocabulary Knowledge Scale (VKS), the aim of which is to construct a “practical instrument for use in studies of the initial recognition and use of new words” (Paribakht & Wesche, 1996, p. 29). The collocations that were familiar or known were excluded from the study, and the target collocations (see Table 4) were introduced to the participants.

Table 4

Target Collocations in the Pilot Study

Verb-Noun Collocations	Adjective Noun Collocations
Dedicate time	Profound impact
Overcome obstacles	Infinite patience
Offer guidance	Detailed description
Convey information	Great admirer
Inspire confidence	Positive outlook

Table 5

Data Collection Instruments and Timeline of the Pilot Study

Session 1 Demographic Information and Look Up Preferences Ques./ Vocabulary Size Test		
Session 2 Vocabulary Knowledge Scale		
Session 3		
(COCA Group)	(Parallel Texts Group)	(Control Group)
Consulting to COCA Corpus	Consulting to Parallel texts	Consulting to Online Dictionary
Receptive and Productive Tests	Receptive and Productive Tests	Receptive and Productive Tests

All the participants were informed about the details and procedures for the study prior to each session. Additionally, they received further assistance and information whenever needed.

Table 6

Concepts and Instruments Used in the Pilot Study

Concept	Instruments	References
L2 Vocabulary	L2 Vocabulary Size Test	Nation, I.S.P. and Beglar, D. (2007)
L2 Vocabulary Knowledge	Vocabulary Knowledge Scale	Paribakht & Wesche (1996)
Receptive Knowledge	Tests of Receptive Knowledge of Form, Use and Meaning	On the basis of Nation , I.S.P 2001
Productive Knowledge	Writing Assignment for Productive Knowledge	Given by the Researcher

The data were gathered through Vocabulary Size Test, the Vocabulary Knowledge Scale, three receptive tests and one productive writing assignment. A reliability analysis was carried out on each test, which comprised 10 questions. Cronbach's alpha showed the Receptive Form Test to have an acceptable level of reliability, with a = .849; as did the Receptive Use Test, with a = .855. However, the receptive meaning test failed to reach acceptable reliability, with a = .428.

Instruments

Vocabulary knowledge scale. Paribakht and Wesche (1996) developed their Vocabulary Knowledge Scale (VKS) to track the acquisition of new words. This 5-point scale consists of self-report and performance items that expect learners to supply rather than to select information on the scale, allowing them to indicate how well they know the words. The purpose of the scale is to compare the effectiveness of an instructional technique on learners' vocabulary improvement. Therefore, the scale was designed to obtain information on each L2 decontextualized target prompt word to reveal the extent of knowledge of the words, as below:

I: I don't remember having seen this word before

II: I have seen this word before, but I don't know what it means

III: I have seen this word before, and I think it means …… (synonym or translation)

IV: I know this word. It means…… (synonym or translation)

V: I can use this word in a sentence. …… (e.g.: please also do section IV)

After participants supplied information on the scale for the words, the assessment categories and scores were determined according to the levels. As the first two levels were self-reported, and the other levels depended on linguistic responses, the responses for the first two levels were scored as 1 and 2 successively. Unaccepted responses in levels 3, 4, or 5 were scored as 2. Similarly, a response to 4 could be scored as 3, or to 5 either 3 or 4. In this study, the exact criteria applied to determine "correctness" was established as follows:

- ✓ First level receives score of 1
- ✓ Second level receives score of 2
- ✓ If the correct synonym or translation is given, the third level receives 3 points; if the translation or synonym is partly correct or incorrect, it receives 2 points.
- ✓ If the correct answer is provided, it is scored as 4; however, if the answer is incorrect or partly correct, the score is 2.
- ✓ If sentence is provided with the correct semantic and grammatical use, it is scored as 5; however, if the answer is incorrect or partly correct, the score is 3.

Drawing from Paul Nation's Vocabulary Lists, potential target collocations were selected according to the vocabulary size of the participants. All potential collocations were listed in the Vocabulary Knowledge Scale and were given to the participants. Responses to only the first and second levels were counted as unknown collocations and used as target collocations.

Receptive tests of form, meaning and use. The receptive tests were designed according to Nation's (2007) description of "What is Involved in Knowing a Word" (p. 27). Nation (2001) proposed a comprehensive framework in which the

aspects of word knowledge are explained by subdividing them into receptive and productive knowledge. Nation (2007) divided the first of these categories into three subcategories: “spoken,” “written,” and “word parts.” The receptive aspect of the “spoken” category is defined as knowing what the word sounds like, while being able to pronounce the word is stated to be the productive part. In the “written” subcategory, knowing what the word looks like is noted as receptive, and knowing how the word is spelled and written is considered to be productive knowledge. Third subcategory of the knowledge of form, “word parts,” refers to the recognizable aspects of a word as receptive knowledge, while using the word parts that are needed to express intended meaning is considered to be productive knowledge.

The receptive test for form was based on the written category, which highlights the importance of knowing what a word looks like and knowing its spelling (see Table 7).

Table 7

Extract from the Receptive Test for Form

Choose the best option with the correct spelling.

1	a.profound	b.prefound	c.profaund
2	a.impect	b.impact	c.inpact
3	a.dedicete	b.deicate	c. dedicate
4	a.temi	c.teim	c.time

In this test, as the study focused on collocation knowledge, each component of the collocations was addressed separately.

The receptive test for use was based on the “collocation” subcategory of “Use,” as this category entails that receptive knowledge of collocations can be presented if learners know which words or parts of words occur with the target word (see Table 8).

Table 8

Extract for Receptive Test for Use

Match each of the words on the left with the word on the right that it often occurs with.

1.profound	a. time	1:
2.dedicate	b. b.impact	2:

The receptive test for meaning was based on the “form and meaning” sub-category of “Meaning”. As the subcategory describes, receptive knowledge of meaning can be presented by understanding the meaning of the collocations in context (see Table 9).

Table 9

Extract from the Receptive Test for Meaning

Read the paragraph and circle the correct collocation.

Over time, there has been several people who had profound impact / infinite patience on various aspects of my life, based on their personal characteristics, and values.

As the reliability of this test was below the desired level, this test type excluded, and a test with a multiple-choice format was included in the main study.

Productive test for form, use and meaning test. The productive test was administered as a writing task that asked the participants to “Write a paragraph with at least 250 words about the ‘Person You Admire ‘.” The participants were informed that they were expected to use the collocations they learned in the previous lesson. The target collocations were selected according to the writing topic, which made their task more manageable.

Rubric for grading the production test. As the participants were asked to write a paragraph using the target collocations they practiced through different methods, their use of the collocations was scored according to a rubric which was prepared

by the researcher. The items in the rubric were determined according to Nation's (2007) framework.

Findings of the pilot study. In this section, the results of the tests from the pilot study are presented, and some implications are drawn from piloting process for the main study.

The first research question was "Which teaching approach (corpus consultancy, paper-based practice on parallel texts or online dictionary practice) contributes more to the participants' collocation knowledge?" As the number of the participants was low, and the data was not normally distributed, the Wilcoxon signed-rank test (nonparametric version of dependent t- test) was used to compare the participants' pre- and post-test scores from the Vocabulary Knowledge Scale.

The Wilcoxon Signed-Rank Test results revealed that there were significant differences between the pre- and post-test scores of all groups, which is a very natural result, as the participants had practiced the target collocations (see Table 10).

Table 10

Wilcoxon Signed Ranks Test Results for Pre- and Post-test of the Vocabulary Knowledge Scale

GROUP	Vocabulary Knowledge Scale	Mean Rank	Z	Asym. Sig. (2-tailed)
Web-Based	Pre-test	.00	-2,524[b]	,012
Concordancing	Post-test	4.5		
Practice on	Pre-test	.00	-2,379[b]	,017
Parallel Texts	Post-test	4		
Online Dictionary	Pre-test	.00	-2,371[b]	,018
	Post-test	.4		

However, to determine if there were statistically significant differences between the corpus based, paper based, and control groups in terms of the collocation knowledge of the participants according to the Vocabulary Knowledge Scale post-test scores, The Kruskal Wallis H test, which is a rank-based nonparametric test, was used (see Table 11).

Table 11

The Kruskal Wallis H Test Results for the Post-test Scores of the Vocabulary Knowledge Scale

	Test Statistics[a,b]	
	Vocab knowledge Pre-test	Vocab Knowledge Post-test
Chi-Square	,000	13,274
Df	2	2
Asymp. Sig.	1,000	,001
a. Kruskal Wallis Test		
b. Grouping Variable: GROUP		

The Kruskal Wallis Test results indicated that there was a significant difference between the three groups of participants. To understand the direction of the difference, Tamhane's post hoc test was conducted (see Table 12).

Table 12

Tamhane's Post Hoc Test Results for Group Differences in VKS

Dependent Variable	GROUP	GROUP	Mean Difference	Std. Error	Sig.
Vocab Knowledge Test Post	corpus based	Parallel text	-,53214	,29814	,290
		Control	1,72500*	,41105	,003
	Parallel text	Corpus based	,53214	,29814	,290
		Control	2,25714*	,32209	,000

The test showed that the Corpus Group outperformed the control group in VKS, X^2 (2)= 13,274, p=001.

The second research question was "Which collocation teaching approach made a more positive contribution to learner's productive and receptive knowledge of use, form and meaning?"

Table 13

Kruskall Wallis Test Results of Receptive Collocation Knowledge of Corpus Based, Paper Based, and Control Groups

	Receptive Form	Receptive Use	Receptive Meaning	Receptive Total
Chi-Square	14,833	6,071	7,537	10,588
Df	2	2	2	2

Asymp. Sig.	,001	,048	,023	,005

The Kruskal Wallis H test, which is a rank-based nonparametric test, was used to determine if there were statistically significant differences between corpus based, paper based, and control groups. The Kruskal-Wallis H test results showed that there was a statistically significant difference in the receptive collocation scores between the different treatments. The receptive form scores of the Corpus Group were X^2 (2) = 14.833, p=0.001, with a mean rank receptive form score of 15.38, 14.57 for the Parallel Texts Group, and 4 for the control group. The receptive use scores of the Corpus Group were X^2 (2) = 6,071, p=0.048, with a mean rank receptive use score of 13.31, 14.37 for the Parallel Texts Group, and 6.86 for the control group. The receptive meaning scores of the Corpus Group were X^2 (2) = 7.537, p=0.023, with a mean rank receptive meaning score of 10.44, 14.86 for the Parallel Texts Group, and 4.93 for the control group. The test also showed a significant difference in total receptive scores between groups: X^2 (2) = 10.588, p=.005. The mean rank of the receptive total score of the Corpus Group was 14.31, 14.86 for the Parallel Text group, and 4.93 for the control group.

Table 14

Kruskal Wallis Test Results of Productive Collocation Knowledge of the Corpus Based, Paper Based, and Control Groups

	Productive Form	Productive Use	Productive Meaning	Productive Total
Chi-Square	6,424	3,929	10,943	11,485
Df	2	2	2	2
Asymp. Sig.	,040	,140	,004	,003

The results of the Kruskal Wallis H test showed a significant difference between the productive form and productive meaning scores of the participants. The Kruskal-Wallis H test results for productive form were X^2 (2) = 6.424, p=.040 with a mean rank of corpus-based productive form score of 15.25, 11.86 for the Parallel Texts Group, and 6.86 for the control group. The productive meaning scores of the Corpus Group were X^2 (2) = 10.943, p=.004, with a mean rank productive meaning score for the corpus-based group of 12.69, 16.07 for the paper based group, and

5.57 for the control group. The productive total scores of the corpus-based group were X^2 (2) = 11.485, p=.003, with a mean rank productive total score for the corpus based group of 13.88, 15.57 for the paper based group, and 4.75 for the control group.

Table 15

Tamhane's Post Hoc Test Results of Productive Collocation Knowledge of Corpus Based, Paper Based, and Control Groups

	Productive Form		Productive Use		Productive Meaning		Productive Total	
	Mean Rank	P Value	Mean Rank	P Value	Mean Rank	P Value	Mean Rank	P Value
Control-	6.86	.011	8.29	.253	5.57	.024	4.71	.006
Corpus Based	15.25		11.50		12.69		13.88	
Control-	6.86	.145	8.29	.110	5.57	.001	4.71	.002
Paper Based	11.86		14.71		16.07		15.57	
Corpus Based -	15.25	.307	11.50	.526	12.69	.282	13.88	.613
Paper Based	11.86		14.71		16.07		15.57	

The results showed there was a statistically significant difference in productive collocation scores between the different treatments. The productive form scores of the Corpus Group were X^2 (2) = 6.424, p=0.040, with a mean rank receptive form score of 15.25, 11.86 for the Parallel Texts Group, and 6.86 for the control group. The productive use scores for the Corpus Group were X2 (2) = 3.929, p=0.048, with a mean rank productive use score of 11.50, 11.86 for the Parallel Texts Group, and 8.29 for control group. The productive meaning scores of the Corpus Group were X^2 (2) = 10.943, p=0.004, with a mean rank productive meaning score of 12.69, 16.07 for the Parallel Texts Group, and 4.71 for the control group. The test also showed a significant difference in total productive scores between groups: X^2 (2)= 11.485, p=.003. The mean rank of the productive total score for the

Corpus Group was 13.88, 15.57 for the Parallel Texts Group, and 4.71 for the control group.

Drawing on Hill's (2000) claim that observing vast amounts of recurring patterns of concrete examples in different contexts is an effective way of learning collocations, the study asked three groups of participants to practice target collocations either through web-based concordancing by consulting the COCA corpus; through parallel texts whose English versions were taken from the same corpus, with a translation carried out by two English Language Teaching PhD Candidates; or through an online dictionary. In line with research results of Cobb (1997), the pilot study showed that online concordancing was more effective on students' collocation learning than searching for the meaning of words in a dictionary. The results of the study also revealed that the participants in both the corpus based and parallel text practice groups improved significantly more than the participants in the control group. This may stem from the fact that seeing the collocations in different contexts and more than once at the same time had a more positive impact on their performance. It was also observed that the same groups (corpus based and parallel texts) improved in noticing and using collocations in their writings. Both groups succeeded in using the target collocations in their tests, and no significant difference was found between the web-based concordancing practice and parallel text practice groups in terms of receptive and productive knowledge of the target collocations, which indicates that both approaches facilitated the collocation knowledge of the participants.

Implications for the Main Study

The pilot study aimed to gather information about the data collection procedure and the instruments to be used in main the study. Based on the participants' suggestions and the researcher's observations, some necessary changes were noted as follows:

- Participants with a higher level of English proficiency were needed, as the participants in the pilot study had difficulty in understanding some of the context in the COCA corpus.

- To determine the retention of the target collocations, a delayed post-test was needed for the receptive and productive tests.
- The participants failed to provide all of the target collocations in the writing task, which made the assessment of productive collocational knowledge difficult. This experience directed the researcher to prepare a controlled productive test for the main study.
- The time allocated for the three groups was the same, but the control group finished searching for the collocations earlier, which led the researcher to believe that there was a need for a task with a higher involvement load for the main study.

Main Study

The aim of the study was to investigate and compare the effectiveness of two approaches on teaching verb-noun and adjective-noun collocation knowledge. Three groups of the participants practiced unknown target collocations through different methods: one group consulted the COCA corpus, one group practiced target items on parallel texts (English-Turkish), and the last group consulted online dictionaries. The study also aimed to reveal the perceptions of the participants on corpus consulting and using parallel texts, which were new experiences to them.

Experimental group condition 1- corpus group. This group was introduced to the COCA corpus and were expected to search for meanings of the target collocations by consulting it.

Experimental group condition 2 - parallel texts group. The small parallel texts corpus, sized 4500 words, consisted of comparable original English texts taken from the COCA corpus and their Turkish translations. Both texts were matched and given to the learners in horizontal lines. All of the samples were extracts of target collocations taken from the COCA corpus. The extracts taken from the corpus were chosen carefully, with only those that were rich in contextual clues (followed by explanations, synonyms, antonyms, and so on) selected. These extracts were translated to Turkish by two PhD candidates majoring in English and checked by another PhD candidate majoring in Translation. The parallel texts consisted of five instances of each collocation in one long or two sentence-level contexts, along with their Turkish translations. The participants in this group were provided with the

corpus and asked to study the target collocations. The details of the required task are explained in the “Task for Intervention” section.

Control group condition - online dictionary. Dictionary use and word lists have been regarded to be the most commonly used vocabulary teaching methods (Nation, 2001). Therefore, various researchers have used online dictionaries as traditional vocabulary learning sources for their control groups’ conditions (e.g., Cobb, 1997; Huang 2014; Kaur & Hegelheimer, 2005, Tsai and Choi 2005). On the basis of these studies, consulting the online dictionaries was considered to be an appropriate source for finding the meanings of the collocations in the control group condition of the current study. However, among the different types of dictionaries used recently, it was difficult to control the usage of all dictionaries. Therefore, in the initial phase of the study, all of the participants were asked questions about their lookup behaviors in order to find the most commonly conducted lookup behavior, which would aid the researcher in confining the usage of the dictionaries so that other variables would be controlled. Accordingly, the lookup preferences of the participants were gathered, and the results are tabulated below, in Table 16.

Table 16

Dictionary Type Preferences of the Participants

	Frequency	Percent	Valid Percent
Paper Based Bilingual	4	4,9	4,9
Online Monolingual	28	34,1	34,1
Online Bilingual	50	61,0	61,0
Total	82	100,0	100,0

The data illustrate that 61% of the participants preferred to use online bilingual dictionaries, while 34% chose online monolingual sources. Only 5% of the participants reported using paper-based bilingual dictionaries. In addition, they were given a series of Likert-type questions concerning the names of the dictionaries, asking them to report how often they used each. A write-in option was also provided to allow them to share other sources they might use when looking up unknown collocations. The results are shown in Table 25.

Table 17

Descriptive Statistics of the Most Commonly Used Dictionaries for Collocations

	N	Minimum	Maximum	Mean	Std. Deviation
Tureng	82	3	5	3,96	,728
Cambridge Collocation Dic.	82	2	4	3,06	,709
Oxford Collocation Dic.	82	2	5	2,91	,652
Macmillan Collocation Dic.	82	1	4	2,88	,908
Ozdic	82	2	4	2,70	,732
Longman	82	2	3	2,39	,491
Merriam Webster	82	1	4	1,99	,598
Valid N (listwise)	82				

As the table indicates, the most commonly used dictionary was found to be Tureng, with a mean score of 3.96. This was followed by the Online Cambridge Collocation Dictionary (M= 3.06) and the Online Oxford Collocation Dictionary respectively (M= 2.91).

To the question on how often they used smartphones and computers for finding the meaning of unknown collocations, it was found that the participants' preference was primarily smartphones, with a mean of 4.22 (see Table 26).

Table 18

Descriptive Statistics for Preferences for Computers and Smartphones to Find Collocations

	N	Minimum	Maximum	Mean	Std. Deviation
Smart Phones	82	3	5	4,22	,685
Computers	82	2	4	2,68	,683

The questionnaire on the lookup preferences of the participants indicates that the participants reported common use of the online dictionary TURENG, which was developed by an experienced Turkish translator, Özgür Süyel. This dictionary provides searchers with the opportunity to viewing all results of a searched term and its other combinations according to different categories (Technical, Law, Medical, and so on. The dictionary can be considered as a unique, as a high percentage of its database consists of phrases and idioms that are not found in other Turkish

dictionaries. The participants also reported using the online Cambridge and Oxford dictionaries, which are both monolingual. The results also revealed that the participants used their smartphones more often than computers when searching for words. Therefore, in the light of these responses, the participants in the control group were asked to use the online Tureng, Cambridge and Oxford Dictionaries via their smartphones to search for the target collocations.

Setting and Participants

The main study was carried out in the English Language Teaching Department at Hacettepe University, a state university in the capital of Turkey. The sampling procedure used by the researcher was purposive, a type of non-probability sampling method that depends on selection of samples according to given criteria. A total of 84 students participated in the study on a voluntary basis. These students had been required to take a standardized exam series in Turkey to gain acceptance to the university program. In this regard, they were required to take a language proficiency exam called the Foreign Language Exam, as well as an exam that assessed their general word knowledge and their aptitude. The language test consisted of 80 multiple-choice questions that assess vocabulary, grammar, and reading proficiency, but not writing, listening, or speaking skills, which showed that their reading, vocabulary, and grammar skills were adequate. After being accepted to Hacettepe University, the participants were then required to take a proficiency exam before beginning their program of study. The school of foreign languages at Hacettepe University provides a one-year intensive foreign language program for candidates who fail to meet the required scores on the proficiency test. The students, whose medium of education will be either fully English or partially English (30%) must complete this program successfully to be able to advance to their first year of study in their program. The school designates proficiency levels in accordance with Common European Framework of Reference for Languages (CEFR), ranging from A1 to C2+ (A1, A2, B1, B1+, B2, B2+, C1, C1+, C2 and C2+). Those who achieve the C1 level on the proficiency exam are admitted to the first year of their program. Moreover, the first-year classes in the department are also designed to improve proficiency by focusing more on English language skills. Courses are provided in reading, speaking, listening, writing, pronunciation and effective communication, placing all students in the position of learners of English

as an L2. Having taken the proficiency exam in the school of foreign languages, the participants of this study advanced to the first year in their individual departments. The vocabulary size of the participants ranged from 6000 to 9000. The department assigned the students randomly in three groups to be able to conduct courses in a more effective way with fewer students. That is, all first-year students were already assigned to groups at the beginning of the study, so the researcher selected the groups (corpus based concordancing, parallel text, and control groups) randomly for each treatment.

Table 19

Descriptive Statistics for Vocabulary Size of the Participants

Group	N	Vocab. Size Mean	Standard Deviation
Control Group	13	7323,08	657,209
Corpus Group	14	7471,43	1447,241
Parallel Texts Group	16	7543,75	1263,840

There were 34 participants in the Corpus Group (25 female and 9 male), 30 participants in the Parallel Texts Group (21 female and 9 male), and 21 participants in the Control Group (16 female and 5 male). However, 41 students were excluded from the study, as they missed some of the sessions. Nonattendance meant that they did not take the required intervention or tests, which were crucial for comparison of the data with the other groups. The participants (ages ranging from 19 to 22) that attended all of the sessions were retained in the study, making the total number 43. See Table 17 for demographic information.

Table 20

Demographic Information of the Participants in the Main Study

Group	Female	Male	Total
Corpus Group	7	7	14
Parallel Texts Group	14	2	16
Control Group	11	2	13
		TOTAL	43

The English learning history of the participants was similar, with nearly all of them reporting that they had studied English for twelve to fifteen years, with a

heavier focus in the last two years to be able to achieve the required national English Proficiency exam scores to study in an English Language Teaching program in a university.

Data Collection

Unlike the pilot study, the data were collected over 14 weeks, and the participants practiced with two sets of target collocations (10 verb-noun and 10 adjective-noun). The data collection instruments and the timeline for the main study are outlined in Tables 18 and 19.

Table 21

Data Collection Instruments

Research Questions	Data Collection Instrument
Demographic Information and Look Up Preferences	Demographic Information and Look Up Preferences Questionnaire
Question 1: Differences achievement of collocational knowledge	Vocabulary Knowledge Scale (VKS)
Question 2: Receptive Knowledge Scores	Receptive Tests
Question 3: Productive Knowledge Scores	Controlled Productive Test
Question 4: Correctly Used Collocation Combinations	Receptive and Productive Tests
Question 5: Participant perceptions on Corpus Consultancy and Parallel Text approaches	Open-ended Questionnaire

Table 22

Data Collection Instruments and Timeline of the Main Study

Group	Session 1	Duration
All groups	Demographic Info / Look Up Preferences Questionnaire +Vocabulary Size Test	55 mins
	Session 2	
All groups	Vocabulary Knowledge Scale	45 mins
	Session 3	
Corpus Group	Pre-test + Teaching how to use COCA corpus	40 mins
	Learning target collocations through concordancing COCA corpus	45 mins
Parallel Texts Group	Pre-test + Learning target collocations through working on Parallel Texts	45 mins

Control Group	Pre-test + Learning target collocations by consulting online dictionaries	45 mins
	Session 4	
All groups	Post-test Receptive Test for Use, Form and Meaning Controlled Productive Test	45 mins
	Session 5 (three weeks later)	
All groups	(Delayed Post-test) Receptive Test for Use, Form and Meaning Controlled Productive Test	45 mins
	Sessions 6,7,8 Except vocabulary size test and vocabulary knowledge scale, same procedures are applied for the second set of the target collocation.	
All groups	Vocabulary Knowledge Scale (as a post-test)	
Corpus and Parallel Text Groups	Open Ended Perception Questionnaire	

The demographic information and lookup preferences of all participants were elicited through a questionnaire. The data on age, gender, and years of English study of the participants were collected, and a few questions were asked to identify their common preferences for using dictionaries, including which dictionaries they generally used when looking up unknown collocations. This information was needed to determine the lookup source for the control group, while the other two groups received different interventions for learning the target collocations.

Vocabulary size test. The Vocabulary Size Test developed by Nation and Beglar (2007) is designed to measure total receptive written vocabulary size of both native and non-native students. This test contains 140 multiple-choice items. For each frequency band (1K,2K,3K, and so on up to 14K), 10 items were chosen from each 1000-word family level. These frequency levels were chosen from word families occurring in the British National Corpus. For example, the first 10 items were for the 1000-word level, the second 10 items were for the 2000-word level, the third 10 items were for the 3000-word level, the fourth 10 items were for the 4000-word level, and so on. Knowledge of the words was tested through decontextualized questions presented in multiple choice format. The vocabulary items were taken from the Nation's (2006) lexical lists obtained from the British National Corpus. Test takers were expected to choose the correct synonym of the underlined word in each question. The number of correct answers was multiplied by 100 to determine the vocabulary size of the test takers, as one test item embodied 100 words. For

example, if a student scored 30 out of 140, the score was multiplied by 100, indicating that the vocabulary size of the student was 3000 word families. A multiple-choice format was selected for several reasons, as outlined by Beglar (2010):

(1) to allow a wide range of content to be sampled efficiently,

(2) to allow the test to be used with learners from a variety of language backgrounds (i.e., many learners are familiar with the multiple-choice format),

(3) to control the level of difficulty of the items by demanding approximately the same degree of knowledge for each item (achieved through the consistent use of one set of items writing procedures)

(4) to make marking as efficient and reliable as possible,

(5) to make learners demonstrate knowledge of each item. (p.103).

A sample question (taken from Nation and Beglar's VST, 2007, p.1) from the test is presented below:

MAINTAIN: Can they maintain it?

a. keep it as it is b. make it larger c. get a better one than it d. get it

The reason for administering this instrument was that such vocabulary size tests are needed to determine the level of course materials that should be developed for a language class. In this regard, Laufer and Goldstein (2004) claimed that size tests are essential, as they lead to more efficient placement in language learning programs. Therefore, the purpose of using the Vocabulary Size Test was twofold. The first reason was to select target collocations that the participants in the study had not seen before. In other words, finding their vocabulary size helped the researcher select appropriate target collocations for the vocabulary knowledge scale that was conducted afterward to assure that the participants did not know the collocations. The second aim was to ease the burden of the participants' tasks, which asked them to find the meaning of the collocation word combinations that were appropriate to their level. Therefore, the vocabulary size of the participants was assessed with the Vocabulary Size Test of Nation and Beglar (2007) (See Appendix B for the full version of the vocabulary size test).

The current adaptation of the instrument was supported by Beglar (2010), who provided preliminary validity evidence for a 140-item form of the Vocabulary

Size Test. The participants in that study were nineteen native speakers of English and 178 native speakers of Japanese. Focusing on several aspects of Messick's (1995) framework, Beglar (2010) based his study on the Rasch model. The results of his study indicated that the performance of the participants and the items were just as he predicted in his *a priori* hypotheses, and early all of the items exhibited a good fit to the Rasch model. It was also found that the Rasch reliability indices were >0.96, which suggested that various combinations of the items measured the vocabulary size of the participants correctly.

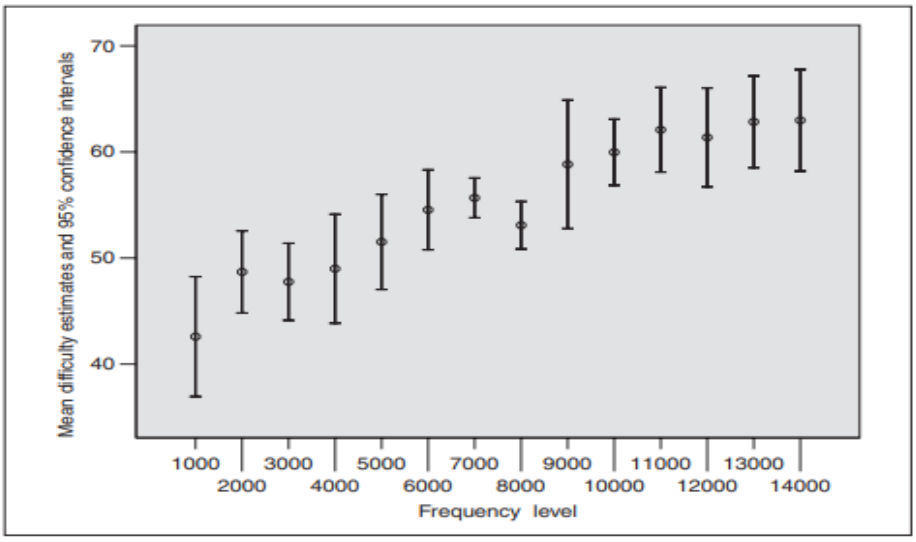


Figure 4. Mean difficulties and 95% confidence intervals for the 14-word frequency levels.

Given the mean ensemble difficulties of the 14-word frequency levels, Figure 4 demonstrates that the theoretical expectations of the vocabulary size test were met, as the mean item difficulties reveal the easiest group was the 1000-word level, while the most difficult group was the fourteenth 1000-word level.

Vocabulary knowledge scale. The purpose of using the vocabulary knowledge scale was twofold. The first reason for doing so was to select unknown collocations. In addition, because the scale was intended to compare the effectiveness of the instructional techniques on learners' vocabulary achievement, the second reason was to determine the extent to which the participants improved their knowledge of the collocations. The participants were scored on both the pre-test and the post-test according to the same scale. As only unknown items were selected for the study, the participants initially received minimum scores. The

difference in the post-test scores of the scale illuminated the collocation improvement among the groups. In this study, the exact criteria applied to determine "correctness" was established as follows:

- ✓ First level received a score of 1
- ✓ Second level received a score of 2
- ✓ If the correct synonym or translation was given, the third level received 3 points; if the translation or synonym was partly correct or incorrect, it received 2 points.
- ✓ If the correct answer was provided, it was scored as 4; however, if the answer was incorrect or partly correct, the score was 2.

The scores obtained from this scale were only the pre-test and post-test scores, which were elicited at the very beginning and at the end of the study.

Target collocations. The COCA corpus that was developed by Mark Davies (2008) at Brigham Young University, which contains more than one billion words, was used to extract the lexical items that were utilized in the study. The items were selected according to their frequency levels and MI scores. The COCA corpus was utilized in the study for various reasons. The first and the most important of these was that it is considered to be the corpus with the largest words size that is available free of charge. Additionally, it is believed to be the most widely used corpus of English, containing a wide array of texts from several genres, thus offering extensive insight into variations of English. After the vocabulary size of the participants was found with the VKS (Nation & Beglar, 2007), the component words of the collocations were researched on the basis of Nation's (2012) BNC/COCA most frequent word lists. As the vocabulary size of the participants was above the 6000-most-frequent-word band, the components of the collocations were primarily selected from the 6000-word list and above in order to find collocations that were unknown to the participants. Nearly every word in these bands was researched for possible collocation combinations. Both components of the target collocation-- i.e., the verb and the noun -- were selected from the same frequency band or above. For example, a noun from 6K (the sixth 1,000 most frequent word families) was paired with a verb from either the 7K, 8K, or 9K band or above.

The minimum frequency of the collocations in the COCA corpus was 50, in line with Nguyen & Webb (2017), who set the minimum frequency as 50 in their study. Furthermore, the MI scores of the collocations, which are indicators of their strength, were set to be 3.0 or higher, as this denotes that a word pair is a collocation (Durrant & Doherty, 2010). A t-score was also integrated into the item development process, in line with existing research (e.g., Gablasova et al., 2017) that holds that an MI value may create problems in calculating the frequency of collocations, especially when each lexical item in a collocation has a high frequency. Therefore, in this study, the MI value was supported with a t-score, both of which indicate the strength of the collocations. In this sense, the t-score calculates how likely it is that the observed frequency of the collocation is not due to chance. As recommended in the literature, t-values of 2.00 or higher are sufficient to assert that a word pair is a collocation (Durrant & Doherty, 2010).

Following the criteria described here, a total of 68 collocations were selected for placement in the VKS (Paribakht & Wesche, 1996). The participants were asked to rate their level of knowledge of collocations according to items in the scale. Based on their responses, the collocations which the participants noted as “I have never seen this word before,” or “I have seen it, but I don’t remember it” were selected as the target collocations for this study. As such, a total of 20 target collocations were selected, and the receptive and productive tests were developed around these collocations.

Table 23

Target Collocations with MI and T Scores

Target Collocation	MI-Score	T-Score
Show solidarity	3,18	11,0535
Exert pressure	7,41	11,97319
Bid farewell	7,42	15,45378
Inflict pain	6,74	12,4702
Vicious cycle	6,33	26,89762
Bear witness	6,58	27,84573
Meticulous attention	5,27	9,343699
Innate ability	5,87	13,97112
Natural Affinity	4,31	8,840655
Intrinsic motivation	5,65	28,40361

Hit puberty	5,82	12,09113
Bear fruit	5,5	21,41173
Lend credence	9,6	10,62887
Yield results	4,37	10,25336
Become ubiquitous	4,18	10,01761
İllicit drug	6,59	24,21083
Piecemeal approach	5,42	10,03764
Noxious fumes	10,39	8,425733
Voracious appetite	11,31	12,08235
Subversive activities	6,2	7,722057

Tasks for the Interventions

Schmidt (2008) claims that intensive engagement with new vocabulary items that are taught clearly through tasks increases the chances for effective learning. The depth of involvement needed has been suggested as comprising three basic components: need, search, and evaluation (Laufer & Hulstijin, 2001). The need component is related to the motivational, noncognitive dimension of involvement, which carries two degrees of prominence: moderate and strong. If the need is externally placed on the learners, the need becomes moderate; on the other hand; if the need is self-imposed, the need becomes stronger. The search and evaluation components, on the other hand, are related to the cognitive dimensions of involvement, which require learners make form and meaning relationship. Search, in this regard, is the process of attempting to find the meaning and usage of unknown words by consulting different sources. Evaluation, moreover, refers to deriving the appropriate meaning and use of a given word in its context. In this process, learners seek for the most appropriate meaning by assessing the usage of word in a context. Just like the need component, the evaluation component has two degrees of prominence: strong and moderate. If learners are expected to use the new word in a sentence, the prominence is strong, but if given word is asked to be used in a given sentence, the prominence is moderate.

The involvement load is evaluated by counting these degrees of prominence. To be able to operationalize the abstract concept of involvement load into a measurable concept, Hustijn and Laufer (2001) proposed an “involvement index,”

which provides a measure for the degrees of prominence. In this process, the absence of a factor is marked 0; if the factor has moderate prominence, it is marked as 1; and if the factor has strong prominence, it is marked as 2. Involvement load hypothesis can be investigated through tasks that require different degrees of need, search and evaluation.

According to this hypothesis, and depending on the nature of the intervention, each group received a different task. The Corpus Group received a paper with three columns; one in which the target collocations were given and two others that were left blank. One of the blank columns asked the participants to the write meaning/translation of the target collocation by consulting the COCA corpus. The participants were then expected to write a sentence using the target collocations in the third column (see Appendix D).

As for the task for the Parallel Texts Group, five instances of each target collocation, along with one or two sentence-level contexts, were taken from the COCA corpus and translated in Turkish. The English and Turkish contexts we placed side by side in two columns. In addition, there was a third, blank column that asked the participants to write a sentence with the target items (see Appendix E).

The task of the Control Group was to find the meaning of the target collocations that were given on the top of the task sheet and place them in an appropriate gap that was given for each sentence on the sheet. They were also given a blank row to write a sentence using the target collocation. Table 13 shows the involvement loads for each of the groups (see Appendix F).

Table 24

Involvement Loads and Indexes of Tasks

	Corpus Group	Parallel Texts Group	Control Group	Reason
Need	Moderate (1)	Moderate (1)	Moderate (1)	All the participants were asked externally to find the meaning of the target collocations.
Search	Strong (2)	Strong (2)	Strong (2)	They were asked to search for meaning to complete the tasks

Evaluation	Strong (2)	Strong (2)	Strong (2)	They were asked to use the collocation in a sentence

As Table 21 demonstrates, an effort was made to keep the involvement loads of the participants similar for each group throughout the tasks.

Item Development for Receptive and Productive Tests

The receptive tests consisted of three parts: form, use and meaning. Each part contained 10 items, addressing all of the target collocations in each set. The receptive tests were designed according to Nation's (2007) description of "What is Involved in Knowing a Word" (p. 27). In this regard, Nation (2001) proposed a comprehensive framework in which the aspects of word knowledge are explained by subdividing them into receptive and productive knowledge. Nation (2007) divided the first category, form, into three subcategories: "spoken", "written" and "word parts". The receptive aspect of the "spoken" category is defined as knowing what the word sounds like, while being able to pronounce the word is stated to be the productive aspect. In the "written" subcategory, knowing what the word looks like is considered as receptive and knowing how the word is spelled and written is considered to be productive knowledge. The third subcategory of the knowledge of form, "word parts", refers to the recognizable aspects of a word as receptive knowledge, while using the word parts that are needed to express the intended meaning is considered to be productive knowledge.

In this study, the receptive test for form was based on the "written" category, which highlights the importance of knowing what the word looks like and knowing the spelling of the word. Therefore, the receptive test for form, in a multiple-choice format, asked the participants to choose the words with the correct spelling. Each word from the collocations was presented separately to assure that the participants knew the spelling of both words. The receptive test for use, on the other hand, was intended to determine of the participants' knowledge on which word could be used with another word. Thus, this test consisted of two sets of words to be matched with each other, and the participants were asked to match the words with their collocation counterparts. The receptive meaning test, moreover, following a multiple-choice

format, asked the participants to choose the best collocation to complete the meaning of the sentence by filling in the blanks. The tests were given one by one successively. None of the participants received the next test until all participants had finished the previous test. The controlled production test, which examined the participants' ability to use a word when prompted by a teacher or the researcher, was administered first. The test included a gap-filling exercise in which a sentence context was presented, and the initial two letters were provided to the participants. The underlying reason for giving the first two letters of the target item was that it would be very easy for the participants to supply the missing parts if the complete node word was given. Therefore, they were given only hints to restrict their answer choices, as with Schmitt (2010), who asserted that learners may give acceptable but irrelevant answers to the target items if the first letter is not given. Another aim of this test was to determine whether the learners could spell the word correctly (to be assessed for productive knowledge of form) and whether they knew the word combinations (to be assessed for productive knowledge of use). Each sentence on the test was taken from the COCA corpus. After the participants completed the productive test, the receptive tests for form, use and meaning were given successively. The participants received 10 points for each correct item on the test (see Appendices D-N for the tests).

Inter-rater Reliability Check

After the receptive and controlled productive tests were prepared with the target collocations, two language experts were consulted. These experts were instructors of English who had been teaching English for at least ten years and who were PhD candidates majoring in English Language Teaching. For the receptive test for meaning and the controlled productive test, as well as the task given to the control group, it was especially important that the language be clear and comprehensible to the participants. As all the material was taken from the COCA corpus, which includes advanced-level authentic language, sentences that could be understood without the support of the context were needed. Therefore, for these two tests types, the experts were given information on the purpose of their consultancy and asked to choose the most comprehensible alternative for the tests. They were given three question options for each collocation and asked to place a tick on the most appropriate items. All of their responses were reviewed, and the items with

multiple ticks were chosen for the tests. On the other hand, for the receptive tests for form and use, the experts were only asked to review the questions and correct any spelling and other mistakes.

After all tests were administered and scored by the researcher, one of these experts was consulted again for scorer reliability. This time, he was asked to score the participants' responses, and Cohen's κ was run to determine if there was agreement between the two raters' scores on the receptive and productive pre-tests, post-tests and delayed post-tests. Table 22 presents the inter-rater reliability analysis of the test scores provided by the two scorers.

Table 25

Interrater Reliability of the Receptive Tests

Test	Cohens' Kappa	Sig.	Test	Cohens' Kappa	Sig
Pre-receptive	.917	.000	Pre-productive	.869	.000
Post Receptive	.949	.000	Post Productive	.875	.000
Delayed Receptive	.901	.000	Delayed Productive	.877	.000

Altman (1991) provided the following guidelines for rating the strength of agreement depending on the K value:

Table 26

Guidelines for Strength of Agreement

Value of *K*	Strength of agreement
< 0.20	Poor
0.21 - 0.40	Fair
0.41 - 0.60	Moderate
0.61 - 0.80	Good
0.81 - 1.00	Very good

On the basis of the guideline above, it can be concluded that there was very good agreement between both raters in terms of all tests scores, as they were found to be above 0.81. In the event of differences in the scores, the responses were checked again, and any necessary corrections were made.

Structured Open-Ended Questionnaire

In order to explore the participants' perceptions of the approaches they used while learning the target collocations, they were asked to answer the following set of open-ended questions:

Questions for the Corpus Group:

- How do you evaluate the experience of learning new collocations by resorting to concordance lines of COCA corpus?
- While reading the concordance lines and their contexts, did you only focus on grasping the meaning of the collocation?
- Did you use before or will you use this method in your vocabulary learning journey?
- What are the advantages or disadvantages of the method?
- Do you have something extra to note about the method?

Questions for the Parallel Text Group:

- How do you evaluate the experience of learning new collocations by working on parallel texts?
- Did you only focus on trying to grasp the meaning of the target collocations, or did you also concentrate on usage of the collocations in different sentences?
- Did you use before or will you use this method in your vocabulary learning journey?
- What are the advantages or disadvantages of the method?
- Do you have something extra to note about the method?

Data Analysis

The data collected for the study consisted of the quantitative scores from the VKS (pre-test and post-test); the scores from the receptive and productive tests (pre-test, post-test and delayed post-test); and the qualitative data derived from the

open-ended questionnaire. The quantitative data were analyzed with the SPSS version 21 software. Descriptive statistics were tabulated for the related chapters and research questions, and statistical analysis was performed. Before conducting the statistical analysis, outliers, nonlinearity, and normality of data were checked to determine which test was appropriate for the analysis. Accordingly, the Wilcoxon signed-rank test (nonparametric equivalent to the dependent t-test) was used to compare the pre-test, post-test and delayed post-test scores on the VKS. This test is used when there is a non-normal data distribution, which makes the use of the dependent t-test inappropriate. The test was used to compare two sets of scores coming from the same participants to investigate any change in scores from one time point to another. The same test was also run for comparison of the post-test and delayed post-test scores of the participants.

To obtain valid results from the Wilcoxon signed-rank test, the data need to pass three assumptions. The first assumption is that the dependent variable in the data should be measured at the ordinal or continuous level. As the scores obtained from the VKS and the receptive and productive tests were at the continuous level, the first assumption was passed. The second assumption holds that the independent variable should consist of two categorical or related groups. As the participants groups were from the same program and had similar proficiency levels, the data also passed this assumption. The third assumption relates to the distribution of the data. As the sample size was limited for each group ($n<30$), the normality assumption was violated, and the data were thus assumed to be not normally distributed.

In addition, the Kruskal-Wallis H Test was used to compare the differences in the receptive and productive scores of the participants. This test is also sometimes called “one-way ANOVA on ranks,” and it is used to determine whether there are statistically significant differences between two or more groups. The test, however, cannot tell which independent variable is statistically significantly different from the others; it can only show that at least two groups are different. Therefore, Tukey’s HD Test was also run to see the relationship between the variables.

Thematic Content Analysis

The data elicited from the open-ended questionnaire were analyzed with thematic content analysis to portray the thematic content of perceptions of the

participants on interventions. Inductive and semantic approach of thematic analysis were taken, and six steps developed by Braun and Clarke (2008) were followed.

Step 1 Familiarization. Before starting to analyze the data, all responses were read to get a thorough overview of the elicited data and initial notes were taken.

Step 2 Coding. Some sections of the texts were highlighted, and each distinct unit of meaning was marked. Repeated patterns (themes) across the data set were found and were coded.

Step 3 Generating Themes. After all the data was initially coded, the long list of coded data was re-focused to derive a broader level of themes by categorizing different codes into potential themes. Candidate main themes were identified.

Step 4 Reviewing Themes. To understand whether the candidate themes are really themes, all candidate ones in the data set were reviewed to see either data within themes cohere together meaningfully or not. Additionally, the existence of clear and understandable distinctions between themes was also considered. Once the data was categorized according to themes, the validity of individual themes was checked by two language experts to ascertain whether the themes are accurate representation of the data set.

Step 5 Naming and Defining Themes. After having a final list of themes, representative names were given by reading the collated data extracts thoroughly again. Sub-themes were identified.

Step 6 Producing the report. Within and across themes, the data extracts were analyzed and reported according to identified themes and sub-themes.

Chapter 4
Findings

This chapter presents the results of the data analysis, along with initial interpretations in reference to the research questions.

Data Screening

Before conducting the analyses using the SPSS software, the assumptions for all of the analyses were reviewed. After all missing values and incomplete items were discarded, the data were tested for violations of normality and linearity.

Table 27

Test of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
Vocab. Size	,150	43	,016	,914	43	,004
Vocab..Knowledge Scale	,154	43	,012	,921	43	,006
Receptive Tests	,155	43	,011	,878	43	,000
Productive Tests	,158	43	,009	,951	43	,068

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

The Kolmogorov-Smirnov and Shapiro-Wilk Normality Test results displayed in Table 27 suggest a violation of assumptions for most of the instruments, as their p values were lower than .05 (Pallant, 2011). Aside from the tests of normality, normal probability plots were checked to gain a clearer understanding of shape of the distribution. The results revealed that the instruments did not indicate a normal distribution, with reasonably not straight lines. This occurred due to the fact that a low sample size lacks sufficient strength to provide meaningful results on normality tests. Therefore, the analyses conducted for the study were based on non-parametric tests, which are also called distribution free tests, where the data did not assume a normal distribution.

Reliability Analyses

Prior to the data analysis, reliability analysis was run for the Vocabulary Knowledge Scale and Receptive and Productive tests.

The reliability analysis of the vocabulary size test. The reliability analysis indicates that the mean Cronbach's Alpha was .82, and all the coefficients of the subscales were above 0.70. Therefore, it can be concluded that the scale was reliable (see Table 28).

Table 28

Results for the Reliability of the Vocabulary Size Test

	Cronbach's Alpha
6000- word band	.862
7000-word band	.844
8000-word band	.791
9000-word band	.813
10000-word band	.831

The reliability analysis of the vocabulary knowledge scale. The results of the analysis are illustrated in Table 29. As indicated, the Cronbach's alpha index of the scale was .75, which is an acceptable value.

Table 29

The Reliability Analysis of Vocabulary Knowledge Scale

	Cronbach's Alpha
Vocabulary Knowledge Scale	.752

The reliability analysis of the receptive tests. As shown in Table 30, the Cronbach's alpha indexes of internal consistency were acceptable for all tests, varying between .712 and .880.

Table 30

The Reliability Analysis of Receptive Tests

	Cronbach's Alpha
Receptive Test for Form	.880
Receptive Test for Use	.856

Receptive Test for Meaning	.712

The reliability analysis of the productive tests. Table 31 reveals the Cronbach's alpha indexes of internal consistency on the productive tests for form.

Table 31

The Reliability Analysis of the Productive Test for Form, Use and Meaning

	Cronbach's Alpha
Productive Test for Form	.74
Productive Test for Use	.761
Productive Test for Meaning	.772

Descriptive Statistics

Vocabulary size of the participants. The first phase of the research focused on finding the vocabulary size of the participants in order to determine the appropriate target collocations from Paul Nations' most frequent word lists. Therefore, all the participants took the Vocabulary Size Test. The results are reported below, in Table 32.

Table 32

Descriptive Statistics for the Vocabulary Size of the Participants

GROUP		N	Minimum	Maximum	Mean	Std. Deviation
Control	Vocab. Size	13	6300	8400	7307,69	680,026
	Valid N (listwise)	13				
Corpus	Vocab. Size	14	5900	9100	7535,71	1359,076
	Valid N (listwise)	14				
Parallel Texts	Vocab. Size	16	5900	9400	7550,00	1254,857
	Valid N (listwise)	16				

A more detailed analysis of the vocabulary size of the participants is provided below, in Table 33.

Table 33

Group Descriptive Statistics for the Vocabulary Size of the Participants

GROUP	Word Size	Frequency	Percent
Control Group	6300	1	7,7
	6600	3	23,1
	7000	2	15,4
	7200	1	7,7
	7700	2	15,4
	7900	2	15,4
	8100	1	7,7
	8400	1	7,7
Total		13	100,0
Corpus Group	5900	1	7,1
	6000	3	21,4
	6600	1	7,1
	6700	2	14,3
	8100	1	7,1
	8600	1	7,1
	8700	1	7,1
	9000	2	14,3
	9100	2	14,3
Total		14	100,0
Parallel Texts Group	5900	1	6,3
	6000	2	12,5
	6100	1	6,3
	6800	2	12,5
	6900	1	6,3
	7000	1	6,3
	7700	1	6,3
	8000	1	6,3
	8600	1	6,3
	8700	1	6,3
	8800	1	6,3
	9000	1	6,3
	9100	1	6,3
	9400	1	6,3
Total		16	100,0

As Table 33 illustrates, the mean scores of the vocabulary size of the participants in each group were similar; for the Control Group, M=73; for the Corpus Group, M= 75, and for the Parallel Texts Group, M= 75. The vocabulary size of the participants ranged from 6000-word families to 10000.

Table 34

Kruskal Wallis H Test for the Vocabulary Size of the Participants

	GROUP	N	Mean Rank	Chi-Square	df	Asymp. Sig.
Vocab. Size	Control	13	20,54	,278	2	,870
	Corpus	14	22,25			
	Parallel Texts	16	22,97			
	Total	43				

The results of the Kruskal Wallis H Test revealed that there was no statistically significant difference between the three groups in terms of their VST scores: F (2,190) = .278, p > 05, r = .870.

In the current study, the mean of the L2 vocabulary size of the English-major undergraduates was found to be moderate (M=74.5/140). The minimum score was found at the 5900-word level, and the maximum score was found at the 9400-word level.

Findings for Research Question 1

According to the scores of the participants on the VKS, are there any differences between the three groups of nonnative English-speaking junior ELT students (the group employing web-based concordance, the group practicing with parallel Turkish and English texts, and the group consulting the dictionary) in their achievement in collocational knowledge?

The study aimed to examine the effects of corpus consultancy, practice with parallel texts, and online dictionary use on the participants' receptive and productive collocational knowledge. To this end, the participants completed the VKS before and after the intervention. The purpose of asking the learners to complete the VKS was two-fold. The first aim was to determine which collocations were unknown to the participants. The second was to score their starting point in order to gather numerical data for quantitative analysis. The participants were also asked to complete the VKS as a post-test at the end of the interventions to shed light on their development of target collocational knowledge. Table 35 summarizes the results of the Wilcoxon Signed Ranks for the pre-and post-test scores of the participants.

Table 35

Comparison of VKS pre-test and post-test scores for instructional effects

Group	Vocabulary Knowledge Scale	Mean Rank	Median	Z	Asym. Sig. (2-tailed)
Corpus Group	Pre-test	.00	20	-3,297[b]	,001
	Post-test	7.5	85		
Parallel Texts	Pre-test	.00	20	-3,520[b]	,000
Group	Post-test	8.5	81.88		
Control Group	Pre-test	.00	20	-3,181[b]	,001
	Post-test	7	76.25		

The pre-test and post-test scores of the VKS, the purpose of which was to compare the effectiveness of the instructional techniques on the learners' vocabulary achievement, were calculated to examine the extent to which the participants learned the target collocations. The Wilcoxon Signed-Rank Test results revealed that there were significant differences between the pre-test and post-test scores of the Corpus Group (Z=3.297, p=.001), the Parallel Text Group (Z= -3.520, p=.000) and the Control Group (Z=3.181, p=.001).

This was not an unexpected result, as the participants proceeded from knowing nothing about the collocation to studying and practicing them via the intervention and tests on the target items. However, to determine if there were statistically significant differences between the Corpus Based, Parallel Texts Group, and Control Groups in terms of the collocational knowledge of the participants according to the Vocabulary Knowledge Scale, their post-test scores were compared with the Kruskal Wallis H test, which is a rank based nonparametric test.

Table 36

Post-test Scores Comparison of the VKS of the Three Groups.

		GROUP	N	Mean Rank	Chi Square	Asymp.Sig
Vocabulary Knowledge Score	Post-test	Control	13	15,96	5.650	.059
		Corpus	14	27,43		
		Parallel Texts	16	22,16		

	Total	43

The Kruskal-Wallis Test was conducted to examine the differences in the post-test scores obtained from the VKS. No significant differences were found among the three categories of participants who received different interventions, $X^2(2) = 5.650$, $p = .059$, with a mean rank VKS score of 15.96 for the Control Group, 27.43 for the Corpus Group and 22.16 for the Parallel Texts Group. Although there was no statistically significant difference among groups, the mean rank scores of the participants revealed that Control Group did not performed as well as the participants in the Corpus Group and the Parallel Texts Group.

Findings for Research Question 2

What are the tests scores on the receptive knowledge of collocations of the three groups of participants?

The participants took a series of receptive tests consisting of tests for form, use and meaning for 20 target collocations To determine any differences between the groups, the participants completed a pre-test, an immediate post-test, and a delayed post-test three weeks after the intervention to be able to determine the retention levels of the collocational knowledge among the groups. Table 37 reports the descriptive statistics for all tests according to the groups.

Table 37

Descriptive Statistics for the Receptive Knowledge of Collocations Total Scores

GROUP		N	Minimum	Maximum	Mean	Std. Deviation
	Receptive PRE total	13	20	37	25,59	5,090
	Receptive POST Total	13	78	100	92,63	6,700
Control	Receptive DELAYED Total	13	72	95	85,77	6,791
	Valid N (listwise)	13				
	Receptive PRE total	14	20	33	26,90	3,572
	Receptive POST Total	14	87	100	96,49	4,566
Corpus	Receptive DELAYED Total	14	85	100	92,86	5,437
	Valid N (listwise)	14				
	Receptive PRE total	16	17	40	24,58	7,290

	Receptive POST Total	16	82	98	92,55	4,892
Parallel	Receptive DELAYED	16	68	98	88,23	7,975
Texts	Total					
	Valid N (listwise)	16				

RQ2 a). Are there any differences in the test scores on total receptive knowledge of collocations between the three groups immediately after the intervention?

To determine the instructional effects on the collocation knowledge of the participants, the pre-test and post-test receptive scores were compared for each group with the Wilcoxon Signed Rank Test. The results are presented in Table 38.

Table 38

Comparison of the pre-test and post-test scores for the instructional effects for the three groups

	Test	N	Mean	Median	Z	Asymp. Sig.
	Pre-test Receptive	14	26,9048	26.67	-3,304[b]	,001
Corpus Group	Scores					
	Post-test	14	95,06	98.75		
	Receptive Scores					
	Pre-test Receptive	16	24,5833	23.33	-3,517[b]	.000
Parallel Texts	Scores					
Group	Post-test Receptive	16	92,50	93.75		
	Scores					
	Pre-test Receptive	13	25,5897	23.33	-3,186[b]	.001
Control Group	Scores					
	Post-test Receptive	13	95,06	95		
	Scores					

The Wilcoxon Signed Rank Test comparison of the post-test scores and pre-test scores indicated significant gains in collocation knowledge (Z = 3,304, p =001) after consulting the corpus. Similarly, the comparison of the post-test scores and pre-test scores indicated significant gains in collocation knowledge of the participants after practicing with parallel texts (Z=3,517, p= .000). The Control Group

also achieved significant gains in collocation knowledge as elicited from the test (Z=3,186, p= .001). The overall results of the analysis showed that the participants' collocation knowledge increased at a statistically significant level after the instruction through the three different approaches.

To examine the potential differences between the groups in their collocation gains, their immediate post test scores were compared with a Kruskal Wallis H Test. Table 39 demonstrates the results.

Table 39 *Group Comparison of the Post-test Receptive Scores of the Participants*

	Group	N	Mean Rank	Chi-Square	df	Asymp. Sig.
Immediate Post-test Receptive Scores	Corpus	14	26,96	6,771	2	,111
	Parallel Text	16	24,72			
	Control	13	24,38			

The table indicates that there was no statistically significant difference between the post-test receptive scores of the participants in their collocational gains, X^2 (2)= 6.771, p=.111, with a mean rank receptive score of 26,96 for the Corpus Group, 24,72 for the Parallel Text Group and 24,38 for the Control Group.

RQ2 b). Are there any differences in the test scores on receptive knowledge of form, use and meaning between the three groups immediately after the intervention?

As the total receptive scores consisted of the results of the receptive tests for form, use and meaning, more detailed analysis was conducted for each of the test scores to reveal which scores of the participants were higher than the others. A Kruskal Wallis H Test was conducted to reveal potential differences between groups. Table 40 outlines the comparison of the groups in relation to each test score.

Table 40

Group Comparison of the Receptive Knowledge of Form, Use and Meaning Post-test Scores

Test	GROUP	N	Mean Rank	Chi-Square	df	Sig.
	Control	13	25,54	2,438	2	
	Corpus	14	22,18			.296

Receptive Knowledge/Form Post-test	Parallel Texts	16	18,97			
	Total	43				
	Control	13	26,00	6,020	2	.051
Receptive Knowledge/Use Post-test	Corpus	14	24,54			
	Parallel Texts	16	17,53			
	Total	43				
	Control	13	17,31	6,529	2	.038
Receptive Knowledge/Meaning Post-test	Corpus	14	28,71			
	Parallel Texts	16	19,94			
	Total	43				

Table 40 illustrates that there was a statistically significant difference in only the scores for receptive knowledge of meaning for the groups X^2 (2) = 6,529, p= .038) To better understand the direction of the differences, Tukey's HSD post-hoc test was also conducted.

Table 41

Post Hoc Analysis for Post-test Receptive Scores of the Groups

		df	Mean Square	Sig.	Direction of Differences
Post-test Receptive Knowledge of Meaning Scores	Between Groups	2	343,173	,049	Cont Group < Corp Group p= .049 Cont. Group < P Group P=.503 Corp Group > P Group P=.346
	Within Groups	40	115,254		
	Total	42			

As seen in table 41, the post-hoc comparisons using Tukey's HSD demonstrated a significant difference between the post-test scores on receptive knowledge of meaning between the Control Group and the Corpus Group. Namely, the scores on the receptive knowledge of meaning for the Control Group (Mean rank= 17,31) were found to be significantly lower than those of the Corpus Group (Mean rank=28,71) with a small effect size (d=0.097). However, no significant difference was found between the Control Group (Mean rank= 17,31) and the Parallel Texts Group (Mean rank = 19,94)

RQ2 c). Are there any differences in the test scores on total receptive knowledge of collocations between the three groups three weeks after the intervention?

To examine potential differences between the groups in their receptive knowledge of collocations after three weeks' time, a Kruskal-Wallis H Test was conducted to compare the delayed post-test receptive scores of the participants.

Table 42

Group Comparison of the Delayed Post-test Receptive Scores of the Participants

	Group	N	Mean Rank	Mean	Chi-Square	df	Asymp. Sig.
Delayed Post-test Receptive Scores	Corpus	14	28,89	92.86	7,150	2	.028
	Parallel Text	16	20,63	88.23			
	Control Group	13	16,27	85.77			

The test indicated a significant difference between groups, X^2 (2) = 7.150, p=.028. To understand the direction of difference between groups, post hoc analysis using Tukey HSD test was run.

Table 43

Post Hoc Analysis for Delayed Post-test Receptive Scores of the Groups

		df	Mean Square	Sig.	Direction of Differences
Delayed Post-test Receptive Knowledge of Meaning Scores	Between Groups	2	176.741	0.33	Cont Group < Corp Group p= .028 Cont. Group < P Group P=.607
	Within Groups	40	47,293		Corp Group > P Group P=.170
	Total	42			

The results shown in Table 43 indicates a significant difference in the delayed post-test scores on total receptive knowledge between the Control Group (Mean rank= 16,27) and the Corpus Group (Mean rank = 28,89). The scores of the Control Group were found to be significantly lower than those of the Corpus Group with a

small effect size (d= 0.164). No significant difference was found between the scores of the Parallel Texts Group and the other groups.

RQ2 d.) Are there any differences in the test scores on receptive knowledge of form, use and meaning between the three groups three weeks after the intervention?

The Kruskal Wallis H Test was run for the delayed form, use and meaning receptive scores of the participants to see which group's retention rate was better. Table 44 demonstrates the results.

Table 44

Kruskal Wallis H Test Results for the Delayed Post-test Receptive From, Use and Meaning Scores of the Participants

Test	GROUP	N	Mean Rank	Chi-Square	df	Sig.
Receptive Knowledge of Form Delayed Post-test	Control	13	24,92	3,448	2	,178
	Corpus	14	24,00			
	Parallel Texts	16	17,88			
	Total	43				
Receptive Knowledge of Use Delayed Post-test	Control	13	21,31	1,568	2	,457
	Corpus	14	25,25			
	Parallel Texts	16	19,72			
	Total	43				
Receptive Knowledge of Meaning Delayed Post-test	Control	13	10,27	18,620	2	,000
	Corpus	14	30,39			
	Parallel Texts	16	24,19			
	Total	43				

The results of the test, as shown in Table 44, demonstrated that there was a statistically significant difference between the delayed post-test scores on the receptive knowledge of meaning among the participants,X^2 (2) = 18.620, p= .000). To better understand the direction of the differences, Tukey's HSD post-hoc test was conducted.

Table 45

Tukey's HSD Post Hoc Test Results for the Delayed Post-test Scores of Receptive Knowledge of Meaning

		df	Mean Square	Sig.	Direction of Differences
Delayed Post-test Receptive Knowledge of Meaning Scores	Between Groups	2	956,88	,00	O Group < C Group p= .000 O Group < P Group P=.001 C Group > P Group P=.274
	Within Groups	4 0	59,772		
	Total	4 2			

As Table 45 illustrates, the post-hoc comparisons using Tukey's HSD demonstrated a significant difference between the delayed post-test scores on the receptive knowledge of meaning between the Control Group (Mean rank = 10.27) and the Corpus Group (Mean rank = 30.39). The scores of the Control Group on receptive knowledge of meaning were found to be significantly lower than those of the Corpus Group with a small effect size (d= 0.117). A Similar significant difference was found between the Control Group (Mean rank =10.27) and the Parallel Texts Group (Mean rank =24.19) with a small effect size (d=0.118)

RQ2 e.) Are there any differences between the three groups in retention of their receptive knowledge of collocations?

To examine ''retention,'' which is defined as the difference in scores between the post-test and the delayed post-test, the Wilcoxon Signed Rank Test was run. The results of the comparisons of the post-test and delayed post-test were illustrated in the table 46.

Table 46

Comparison of Post-test and Delayed Post-test Receptive Scores of the Corpus Group

	Test	N	Mean Rank	Median	Z	Asymp. Sig.
	Post-test Receptive Scores	14	4.00	98.75	-2,348[b]	.019

Corpus Group	Delayed Post-test Receptive Scores	14	7.90	94.58		
Parallel Texts Group	Post-test Receptive Scores	16	6.25	93.75	-1,991[b]	.046
	Delayed Post-test Receptive Scores	16	8.64	88.33		
Control Group	Post-test Receptive Scores	13	4.506	95	-2,710[b]	.007
	Delayed Post-test Receptive Scores	13	6.68	86.67		

The Wilcoxon Signed Rank Test comparison of the post-test scores and delayed post-test scores showed that a 3-week delay between tests elicited a significant decrease in receptive knowledge aspect of the collocational knowledge in the Corpus Group (Z= 2,348 , p = .019), in the Parallel Texts Group (Z= -1,991 ,p= .046 and in the Control Group (Z = 2,710, P= .007) with small effect sizes of 0.144, 0.29 and 0.038 respectively.

RQ2 f.) Are there any differences between the three groups in the retention of their receptive knowledge form, use and meaning knowledge of collocations?

The Wilcoxon signed rank test was run to identify any differences in the post-test and delayed post-test scores of the participants. Table 47 shows the results of the analysis.

Table 47

The Group Comparison for the Retention of Receptive Knowledge of From, Use and Meaning

Group	Test	N	Mean Rank	Median	Z	Sig.
	Receptive Meaning		6.81	80	-1,924b	,054
	Delayed Receptive Meaning Post		3.83	85		

	Receptive Use		5	85	-2,395b	,017
Control	Delayed	13				
Group	Receptive Use		1	100		
	Post					
	Receptive Form		3	100		
	Delayed				.000	1,000
	Receptive Form		1.5	100		
	Post					
Corpus	Receptive		4.5	95	-,539[b]	,590
Group	Meaning					
	Delayed					
	Receptive		6	100		
	Meaning Post					
	Receptive Use		5.70	91.50	-1,871[b]	,061
	Delayed	14				
	Receptive Use		4.13	100		
	Post					
	Receptive Form		4	100	-,812[d]	,417
	Delayed					
	Receptive Form		5.80	100		
	Post					
Parallel	Receptive		6.33	90	,454[b]	,650
Texts	Meaning					
Group	Delayed					
	Receptive		5.60	97.50		
	Meaning Post					
	Receptive Use		8.5	70	-2,052[b]	,040
	Delayed					
	Receptive Use	16	5	86.25		
	Post					
	Receptive Form		5.70	97.50	-,730[b]	,465
	Delayed					
	Receptive Form		4.13	97.50		
	Post					

The results of the test showed that post-test receptive knowledge of use scores of the Control Group (Median = 100) decreased significantly in delayed post-test (Median =85), Z= -2,395, p= 0.17). The effect size for this analysis (d= 0.058) was found to be small. Similar results were found between post test scores of the parallel text group (Median = 86.25) and delayed post-test scores (Median = 70), Z= -2,052, p= .040. The effect size of this analysis was found to be small (d= 0.063)

RQ2 g.) Which collocation combination (Adjective-Noun or Verb-Noun) was used more correctly on the receptive tests?

A paired samples t-test was run to answer this research question. The receptive scores elicited from all of the verb-noun and adjective-noun collocations were computed and the results of the test are tabulated in Table 48.

Table 48

Correctly Used Verb-Noun and Adjective-Noun Collocations on the Receptive Tests

	N	Mean	Std. Deviation	df	t	Sig. (2-tailed)
Verb-Noun Receptive	43	6,5535	33.760	42	8.673	.000
Adjective-Noun Receptive	43	6,1070		42		

The analysis showed that verb-noun collocation combinations were used significantly more correctly than adjective-noun collocation combinations, t(42) = 8,673, p=.000, with a small effect size (d=0.038).

RQ2 h.) Is there any difference between groups in terms of correctly used collocation combinations on the receptive tests?

To answer this research question, a Kruskal-Wallis H test was conducted, and the results are presented in Table 49.

Table 49

Group Differences: Correctly Used Verb-Noun and Adjective-Noun Collocations on the Receptive Tests

	Group	Mean rank	Chi-Square	df	Asymp. Sig.	Tukey's HSD
Verb Noun Receptive	Control Corpus Parallel Texts	9,54 34,86 20,88	27,774	2	,000	Corpus > Control p.000 Corpus > Parallel p.000 Parallel > Control p.002
Adjective Noun Receptive	Control Corpus Parallel Texts	10,04 35,93 19,53	29,893	2	,000	Corpus > Control p.00 Corpus > Parallel p.00 Parallel > Control p.013

The Kruskal-Wallis H test revealed a statistically significant difference in correctly used verb-noun collocations combinations, $\chi^2(2)= 27,774$, p=000, with a mean rank of receptive verb noun collocation score of 34,86 for the Corpus Group, 20,88 for the Parallel Texts Group, and 9,54 for the Control Group. To understand

the direction of the difference, post-hoc comparisons were made using Tukey's HSD test. The test demonstrated that the Corpus Group (mean rank=34,86) outperformed the other two groups (Parallel Texts Group Mean rank =20,88, with a small effect size (d=0.049) and the control group (mean rank =9,54) with a small effect size (d= 0.086) in receptive knowledge of verb-collocation combinations. Similarly, the Parallel Texts Group (mean rank= 20.88) outperformed the Control Group (mean rank=9,54) with a small effect size (d=0.041).

Likewise, the Kruskal-Wallis H test revealed a statistically significant difference in correctly used adjective-noun collocations combinations, $\chi^2(2)$= 29,893, p=000. Post-hoc comparisons using Tukey's HSD showed that the adjective-noun receptive knowledge scores of the Corpus Group (mean rank= 35,93) were significantly higher than the Parallel Texts Group (mean rank = 19,53) with a small effect size (d= 0.056) and the Control Group (mean rank =10,54) with a small effect size (d=.090). When the same scores were compared for Parallel Texts (mean rank=19.53) and Control Group, the test showed that Control Group's adjective-noun receptive collocation scores were significantly lower than the Parallel Texts Group with a small effect size (d= 0.068) .

Findings for Research Question 3

What are the test scores for the productive knowledge of collocations for the three groups of participants?

The responses of the participants to the controlled productive test were scored according to three criteria to obtain numerical data on their productive knowledge of form, use and meaning. That is, one correct or incorrect answer was scored in accordance with Nation's (1997) description of productive knowledge of form, use and meaning. The following criteria were applied:

- If the spelling of the collocations was correct, the participant got 10 points for form.
- If the correct collocate of the word was written, the participant got 10 points for use.

- If the correct collocation was used to fill in the gap, the participant got 10 points for meaning.

According to the criteria above, all the scores were calculated and reported in Table 50 below.

Table 50

Descriptive Statistics for Productive Knowledge of Collocation Total Scores

GROUP		N	Minimum	Maximum	Mean	Std. Deviation
	Productive Pre Total	13	,00	10,00	2,3077	4,38529
	Productive Post Total	13	42	92	78,85	13,917
Control	Productive Delayed Total	13	27	85	66,41	19,327
	Valid N (listwise)	13				
	Productive Pre Total	14	,00	10,00	1,4286	3,63137
	Productive Post Total	14	52	100	81,79	14,697
Corpus	Productive Delayed Total	14	55	100	79,17	12,451
	Valid N (listwise)	14				
	Productive Pre Total	16	,00	3,33	,6250	1,34371
	Productive Post Total	16	57	90	79,90	9,437
Parallel Texts	Productive Delayed Total	16	47	90	70,63	11,720
	Valid N (listwise)	16				

The table illustrates that mean scores of the participants increased after the interventions; however, the scores decreased three weeks after the intervention.

RQ3 a). Are there any differences in the test score on the total productive knowledge of collocations between the three groups immediately after the intervention?

Wilcoxon Signed Rank test was run to compare the pre-test and post-test scores for the productive tests. Results are given in Table 51.

Table 51

Pre- and Post-test Comparison of the Three Groups

	Test	N	Mean rank	Median	Z	Asymp. Sig.

	Pre-test Scores	Productive	14	.00	.00	-3,308[b]	001
Corpus Group	Post-test Scores	Productive		7.5	87.50		
	Pre-test Scores	Productive		,00	.00		.000
Parallel Texts Group	Post-test Scores	Productive	16	8.5	79.17	-3,526[b]	
	Pre-test Scores	Productive		.00	.00		
Control Group	Post-test Scores	Productive	13	7	81.67	-3,190[b]	.001

The Wilcoxon Signed Rank Test comparison of the post-test scores and pre-test scores indicated significant gains in the participants' collocation knowledge in the Corpus Group (Z= -3,308 p = .001). Similarly, the comparison of the post-test scores and pre-test scores indicated significant gains in collocation knowledge of the Parallel Text Group (Z= -3,526, p = .000) in. The Control Group also demonstrated significant gains in collocation knowledge (Z= -3,190, p=.001 according to the test.

The results of the analysis indicate that the participants' overall productive collocation knowledge increased at a statistically significance level after learning through the three different methods. To understand which group performed better, their immediate post-test scores were compared with Kruskal Wallis H test. Table 52 shows the results of the test.

Table 52

Group Comparison of Immediate Post-test Productive Scores of the Participants

	Group	N	Mean Rank	Chi-Square	df	Asymp. Sig.
Post-test Productive	Corpus	14	28,50	5,666	2	,059
	Parallel Text	16	19,09			
	Control	13	18,58			

As shown in Table 52, no significant difference was found between groups in terms of total productive post-test scores (X^2 (2)= 5.666, p=.059

RQ3 b.) Are there any differences in the test scores in terms of productive knowledge of form, use and meaning between the three groups immediately after the intervention?

To examine potential differences between the groups in their productive knowledge of form, use and meaning, a Kruskal Wallis H Test was conducted with the post-test productive scores of the participants. Table 53 demonstrates the results of the test.

Table 53

Kruskal-Wallis H Test for Immediate Post-test Results for the Productive Tests

Test	GROUP	N	Mean Rank	Chi-Square	df	Sig.
Productive Knowledge of Form Immediate Post-test	Control	13	14,04	8,649	2	,013
	Corpus	14	27,96			
	Parallel Texts	16	23,25			
	Total	43				
Productive Knowledge of Use Immediate Post-test	Control	13	26,42	2,994	2	,224
	Corpus	14	20,61			
	Parallel Texts	16	18,59			
	Total	43				
Productive Knowledge of Meaning Immediate Post-test	Control	13	26,63	3,191	2	,203
	Corpus	14	20,39			
	Parallel Texts	16	18,63			
	Total	43				

The findings of the Kruskal Wallis H Test indicated that there was a significant difference in the immediate scores with respect to the productive knowledge of form of the participants: $X^2(2)=8,649$, p= .013. To determine which pairs of groups differed significantly, Tukey's HD post hoc analysis was performed (see Table 54).

Table 54

Tukey's HSD Post Hoc Test Results for the Immediate Post-test Scores on Productive Knowledge of Form

	df	Mean Square	F	Sig.	Direction of Differences

Immediate Post-test Productive Knowledge of Form Scores	Between Groups	2	958,966	4,874	,013	Cont. < Corp. p = .010 Cont.< Par. P =. 091 Cont.> Par. P =.549
	Within Groups	39	196,732			
	Total	41				

The post-hoc comparisons using Tukey's HSD demonstrated a significant difference between the immediate post-test scores on productive knowledge of form between the Control Group and the Corpus Group; namely, the scores of the Control Group (Mean rank= 27.25) were found to be significantly lower than those of the Corpus Group (Mean rank= 13.46) with a small effect size (d=0.1084) However, no significant difference was found between the Corpus Group and the Parallel Texts Group (Mean rank=22.50).

RQ 3c.) Are there any differences in the test scores on total productive knowledge of collocations between the three groups three weeks after the intervention?

To answer this research question, Kruskal Wallis Test was run. Results are tabulated in the table 55.

Table 55

Group Comparison of Delayed Post-test Productive Scores of the Participants

	Group	N	Mean Rank	Chi-Square	df	Asymp. Sig.
Delayed Post-test Productive	Corpus	14	28,21	9,325	2	,009
	Parallel Text	16	23,25			
	Control	13	13,77			

The analysis, as shown in Table 55, revealed a significant difference between groups in their delayed total productive post-test scores. To find the direction of the difference, Post Hoc pairwise comparisons using Tukey HSD were done, and the results are demonstrated in Table 56.

Table 56

Post-Hoc Tests for Group Comparisons in Delayed Post-test Scores

	Mean Square	F	Sig.	Direction of Differences

Delayed Post-test Total Productive Scores	Between Groups	1440,49	6,287	,004	Cont. < Corp., p= .003 Cont. < Par., p=. 061 Corp.> Par., p =.614
	Within Groups	229,138			
	Total				

The results indicated that there was a statistically significant difference between the Control Group and the Corpus Group, as the scores of the Control Group (Mean rank= 13.77) were found to be significantly lower than that of Corpus Group (Mean rank = 28.21, p=.003) with a small effect size (d=0.1638). However, although the scores of the Corpus Group were higher than those of the Parallel Texts Group (Mean rank =23.25), the difference did not reach a statistically significant level. Additionally, no significant difference was found between the Control Group and Parallel Texts Group.

RQ3 d.) Are there any differences in the test scores on productive knowledge of form, use and meaning between the three groups three weeks after the intervention?

A Kruskal Wallis H Test was run to see the potential differences (see Table 57).

Table 57

Kruskal Wallis H Test for Delayed Post-test Results for Productive Tests

Test	GROUP	N	Mean Rank	Chi-Square	df	Sig.
Productive Knowledge of Form Delayed Post-test	Control	13	11,50	13,819	2	,001
	Corpus	14	29,29			
	Parallel Tests	16	22,19			
	Total	43				
Productive Knowledge of Use Delayed Post-test	Control	13	22,58	2,945	2	,229
	Corpus	14	25,04			
	Parallel Tests	16	17,59			
	Total	43				
Productive Knowledge of	Control	13	22,63	2,224	2	,329
	Corpus	14	24,46			

Meaning Post-test	Delayed	Parallel Tests	16	18,06
		Total	43	

The test revealed statistically significant difference in productive knowledge of form scores of the participants (X^2 (2)= 13,819, p=.001). To understand the direction of the difference, Tukey's HD test was conducted. Table 58 demonstrates the results.

Table 58

Post Hoc Test Results for Delayed Post-test Productive Knowledge of Form

		df	Mean Square	F	Sig.	Direction of Differences
Delayed Post-test Productive Knowledge of Form Scores	Between Groups	2	1955,5	9,523	,000	Cont.< Corp., p= .000
						Cont. < Par., p =.027
	Within Groups	39	205,3			Corp > Par., p =.165
	Total	41				

According to Table 58, the post-hoc comparisons using Tukey's HSD also demonstrated a significant difference between the scores on the delayed post-test for productive knowledge of form between the Control Group (Mean rank= 11.50) and the Corpus Group (Mean rank=29,29) . In this regard, the scores of the Control Group were found to be significantly lower than those of the Corpus Group (p=.000) with a small effect size (d= 0.1902). A similar significant difference was found between the Control Group (Mean rank= 11.50) and the Parallel Text Group (Mean rank = 22.19), indicating that the Control Group's performance on the test was significantly lower than that of the Parallel Texts Group (p=.027). The effect size of this difference was found to be small (d= 0.1032)

RQ 3e.) Are there any differences between the three groups in the retention of their productive knowledge of collocations?

To find the retention rates of the participants, their post-test and delayed post-test scores were analyzed with a Wilcoxon Signed Rank Test. Table 59 shows the results of the analysis.

Table 59

Post and Delayed Post-test Comparison of Productive Scores

	Test	N	Median	Mean Rank	Z	Asymp. Sig.
Corpus Group	Post-test Productive Scores	14	87,50	4,75	-,868	,386
	Delayed Post-test Productive Scores	14	76,67	6,00		
Parallel Texts Group	Post-test Productive Scores	16	79,17	1,50	-,3,334	,001
	Delayed Post-test Productive Scores	16	71,17	8,46		
Control Group Group	Post-test Productive Scores	13	81,67	1,50	-2,945	,003
	Delayed Post-test Productive Scores	13	75	6,95		

The Wilcoxon Signed Rank Test comparison of the post-test scores and delayed post-test scores indicated that retention of the productive knowledge of collocations of the Control Group and the Parallel Texts Group decreased significantly. In this respect, the post-test scores of the Control Group (Mean rank= 1,50) decreased significantly on the delayed post-test (Mean rank= 6,95), which was also seen with the Parallel Texts Group whose post test scores (Mean rank= 1,50) decreased after three weeks (M= 8,46). However, no significant decrease was found in the scores of the Corpus Group, indicating a better retention in productive knowledge.

RQ3 f.) Are there any differences between the three groups in the test scores with respect to retention of their productive knowledge of form, use and meaning?

Wilcoxon Signed Rank test was conducted to reveal the retention rates of the participants' productive knowledge of form, meaning and use. The results are presented in Table 60.

Table 60

Group Comparison for Retention of Productive Knowledge of Meaning, Use and Form

Group	Test	N	Mean Rank	Z	Sig.
	Productive Meaning Delayed		7,00	-2,143[b]	,032
	Productive Meaning Post		4,75		
	Productive Use Delayed	13	,00	-2,527[b]	.012
Control Group	Productive Use Post		4,50		
	Productive Form Delayed		,00	-2,814[b]	,005
	Productive Form Post		5,50		
Corpus Group	Productive Meaning Delayed		5.33	-,282[b]	.778
	Productive Meaning Post		4.00		
	Productive Use Delayed	14	3,88	-,834[b]	.404
	Productive Use Post		5,90		
	Productive Form Delayed		3,83	-1,310	,190
	Productive Form Post		5,58		
Parallel Texts Group	Productive Meaning Delayed		6.00	-2,958[b]	,003
	Productive Meaning Post		0		
	Productive Use Delayed		,00	-2,958[b]	.003
	Productive Use Post	16	6,00		
	Productive Form Delayed		3,50	-3,037[b]	,002
	Productive Form Post		8,69		

The Wilcoxon Signed Rank Test showed a statistically significant decrease in the test scores on productive knowledge of use, both in the Control Group (Z= -2,527, p= .012) and in the Parallel Texts Group (Z= -2,958b, p= .003). Similarly, both groups (Control Group: Z= -2,814 , p=.005 ; Parallel Text Group: Z= -3,037 ,p= .002); decreased in performance in the productive knowledge of form test, scoring

significantly lower than on the immediate post-test. The test also revealed that productive knowledge of meaning scores of the Parallel Texts Group (Z= 2,958 P= 003.) decreased at a statistically significant level on the delayed post-test.

RQ3 g.) Which Collocation Combination (Adjective-Noun or Verb-Noun) was used more correctly on the productive tests?

To answer this research question, the productive scores elicited from all verb-noun and adjective-noun collocations were computed with paired sampled t-test. The results of the test are outlined in Table 61.

Table 61

Correctly Used Verb-Noun and Adjective-Noun Collocation on the Productive Tests

	N	Mean	Std. Deviation	df	t	Sig. (2-tailed)
Verb-Noun Productive	43	5,2256	,67277	42	-8,176	,000
Adjective-Noun Productive	43	4,7977	,72935			

The analysis showed that verb-noun collocation combinations were used significantly more correctly than adjective-noun collocation combinations, t(42)= -8,176, p=.000, with a small effect size (d=0.060).

RQ3 h.) Is there any difference between groups in terms of correctly used collocation combinations on the productive tests?

To answer this research question, a Kruskal-Wallis H test was conducted, and the results are presented in Table 62.

Table 62

Group Differences: Correctly Used Verb-Noun and Adjective-Noun Collocations on the Receptive Tests

	Group	Mean Rank	Chi-Square	df	Asymp. Sig.	Tukey's HSD
Verb Noun Productive	Control	7,77				Corpus > Control p.000
	Corpus	36,50	35,600	2	,000	Corpus > Parallel p.000
	Parallel Texts	20,88				Parallel > Control p.000
Adjective Noun Productive	Control	10,08				Corpus > Control p.00
	Corpus	31,50	30,482	2	,000	Corpus > Parallel p.10

	Parallel Texts	13,00	Parallel > Control p.150

A Kruskal Wallis H test was conducted to identify any potential differences between the groups in terms of correctly written verb-noun and adjective-noun collocation combinations. The test showed that there was a statistically significant difference in the verb-noun collocation productive scores, $\chi^2(2)= 35,600, p=0.000$, with a mean rank verb noun productive score of 36,50 for the Corpus Group, 20,88 for the Parallel Texts Group, and 7,77 for the Control Group. To determine where these differences lie between groups, a Tukey HD post hoc test was conducted, which indicated that the Corpus Group's verb noun collocation production scores were significantly higher than those of the Parallel Texts Group (p= 0.000), which were also significantly higher than those of the Control Group (p= 0.000). The test also showed that the scores of the Control Group were significantly lower than those of the Corpus Group (p= 0.000). In a similar vein, the Kruskal Wallis H test revealed a significant difference in the adjective-noun collocations, $\chi^2(2)= 31,482, p=0.000$. To understand the direction of the difference between the groups, the Tukey HD post hoc test was conducted. The results indicated that the Corpus Group's adjective-noun collocation production scores were significantly higher than those of the Parallel Texts Group (p=0.000). On the other hand, the scores of the Parallel Texts Group were not significantly higher than those of the Control Group (p=0.150), while the scores of the Control Group were significantly lower than those of Corpus Group(p=0.000).

Findings for Research Question 4

What are the Participants' Perceptions Towards the Use of Corpus-Based Instruction in the Learning of Target Collocations?

The participants were asked to evaluate their corpus experience through an open-ended questionnaire. Nearly 36% of the participants reported that using the corpus to learn the target items was a little bit difficult at the beginning, as with the following responses:

- In the beginning, I was surprised to see many instances of the same collocations on the computer. I checked the context of the collocations and tried to grasp the meaning of them from different contexts. Sometimes it was

difficult to predict the meaning, but because of the high number of example sentences, I found the meaning of the collocations (S2).

- In the beginning, using concordance lines to learn the unknown collocations seemed to be difficult, but later, I got used to it (S4).
- You need to exert extra effort to learn the unknown collocations, and I think learners need more time to concentrate on the example sentences. Some of the sentences were very difficult for us. I wish the sentences were simpler and more understandable (S5).
- I really had difficulty in understand the meaning of some adjectives and nouns. I think this approach is useful, but a little bit difficult (S9).
- I believe I learned the target collocations, but without seeing their Turkish translation, it was a little bit difficult (S16).

Additionally, an evaluation of their experiences revealed that nearly 62% of the participants found that the corpus offered them the opportunity to encounter many authentic instances of the target collocations and made comments on benefits of encountering with authentic language data in the corpus. Some of the following responses are presented below:

- Web-based concordancing has provided us with different authentic instances of the target words, which helped me to understand the meaning from the context. I felt confident to derive the meaning while working with these authentic samples of language data (S1).
- In the beginning, I was surprised to see many authentic instances of the same collocations in the corpus. I tried to read more comprehendible examples and checked the context of the collocations to grasp the meaning of them. (S7)
- As I had chance to see the target collocations in many authentic contexts, I read multiple contexts and learned them easily. And I also learned their usage from sentences, which made feel at ease with both usage and meaning of the collocations (S3).
- I first tried to understand the meaning of the collocations from the news corpus. Later on, I checked the magazine and fiction sections of the corpus to see more instances of them. At the end, I predicted their meaning (S8).

- I enjoyed trying to grasp the meaning of the target collocations from the corpus by seeing different contexts (S10).
- This was a different experience for me. It was useful, as I had chance to see a variety of usage of the same collocations (S13).

When the participants were asked to report whether, apart from focusing on the target collocations, they tended to observe different word forms and their positions in the examples, nearly 90% of the participants shared that they only concentrated on predicting the meaning of the target collocations.

As for the advantages and disadvantages of the corpus consultancy, 80% of the participants noted that having a chance to see different usages of the target collocations in various contexts facilitated their learning and retention of the target items. For example, S14 stated “I think this approach makes learning more permanent, as we saw many instances of the collocations used in different contexts”

They also reported that the corpus offered learners an independent way to learn new words anytime and anywhere they could easily access the corpus. However, nearly all the participants came to a common decision that corpus consultancy took too much time and energy. Additionally, 30% of the participants mentioned that the difficulty level of some contexts deterred them from grasping the meaning of the collocations. Furthermore, a few participants reported that in some cases where internet connection was not available, corpus consultancy may not possible. Furthermore, considering proficiency level as an important factor, a participant stated that “Discovering the meaning of the words in different contexts is something very useful, but those who are not proficient enough may have difficulty in understanding the words” (S2).

The participants were also asked about their intention of using the concordance lines in the COCA corpus in their later studies. All the participants in the Corpus Group reported that they will use the method in the future.

Finally, the participants were asked to share whether they had something additional to say about the method. Some participants maintained that instead of the COCA corpus, a corpus that offers easier contexts would be better to study target items. As the participants only concentrated on finding the meaning of the target items from the COCA corpus, they reported a need for confirmation of their

predictions of the meaning of the target items. In other words, they shared that they needed to check a bilingual dictionary to confirm the meaning.

Perceptions of Students Towards Parallel Text Instruction in the Learning of Target Collocations

The participants were asked to evaluate their parallel text practice through an open-ended questionnaire. Nearly 70% of the participants reported that drawing the meaning of the target items from the parallel texts was easy and productive. Below are some examples of their responses:

- I recognized that I learned the collocations unconsciously when I practiced them using the paper-based parallel texts. Maybe only for a short time, but I believe it has an impact on our learning (S5).
- Trying to grasp the meaning of the target collocations that are written and highlighted in English sentences from the Turkish context helped me to see both the usage of the collocations in English and their meaning in Turkish. This helped me to learn the collocations more easily (S11).
- Although it was the first time that I had seen the target items, seeing them in multiple contexts with their translations helped me to learn the items easily (S9).

From the responses to the first open ended question, another emerging theme was the retention rate of the newly practiced target collocations. Nearly 76% of the participants believed that this method facilitated their learning in a relatively short time, and retention of the items was regarded to be better when they compared the method with the methods they had used in their previous studies. Some of their responses were as follows:

- I did not exert effort to memorize the collocation. I believe this practice was very effective and long lasting (S15).
- I was able to produce a new sentence with the target collocations after I saw two or three usages of the target collocations in the English and Turkish context (S16).

- Having a chance to analyze the usage of the same collocations in different English and Turkish sentences helped me remember the collocations better (S8).

Given the fact that parallel texts offered not only linguistic equivalents, but also different contexts in which the target items were used, the participants were asked to report whether, apart from focusing on the target collocations, they tended to observe different word forms and their positions in the examples. 40% of the participants reported that they first tried to grasp the meaning only by looking at the English contexts. When they did not understand the meaning from the English, they read the Turkish equivalents. In addition, 60% of the participants reported that they checked whether the target items had different meanings in different contexts. On the basis of these themes, some example statements are given as follows:

- I first concentrated on the meaning of the collocations from the Turkish context. Then I checked whether the collocation can be used in different meanings or in different ways (S2).
- I first tried to get the meaning of the target collocations from the English sentences, then I checked their Turkish translations (S1, S9).I focused on how the collocations were used in the sentences, and I also checked whether the usage of the collocations may change in different contexts, both in English and in Turkish. I also had the chance to see the Turkish translations of the same collocations in different contexts (S11).

The participants were also asked whether they intended to use parallel texts in their later studies. Nearly all the participants stated that they will use the method to learn new vocabulary items, as they thought that the method was manageable and easy to adopt for their individual studies. For example:

- I am planning to use it, as I think this way of learning new words is less boring (S6).
- As the method is more student centered, I believe I can improve my word knowledge and grammar easily on my own, so I will use it in my later studies (S13).

Furthermore, some of the participants shared that they had used the method in different forms in their previous English learning journey. For example, S2 stated

that he usually turns on English subtitles and pays attention to whether their Turkish equivalents are appropriate or not. Another participant, S(8), maintained that he always checks the English translations of Turkish expressions in public and touristic places and compares them to learn new words and to find out problematic expressions in translated versions.

When the participants were asked to comment on the advantages and disadvantages of the method, their ideas were similar in most points. For example, most of the participants regarded the possibility to see different usage of the same words in different contexts both in English and Turkish as advantageous, as it helped them to learn the target items more easily. However, some of the participants saw this as a disadvantage, since they believed that retention of the items would not be long-lasting. For instance:

- You can see the meaning of the words and their translations. In this way, you grasp the meaning faster, but I think learning is not permanent (S2).Having the chance to see the target collocations both in English and Turkish may help us improve our translation abilities. Additionally, it also helps us see usage of the target word in different contexts (S11).

The other theme that emerged from their statements was that most of the students saw this method as student-centered, allowing them to be independent from the teacher. Some example statements on this issue are as follows:

- Without any assistance from anyone, I could easily learn the collocations, which makes the approach very advantageous (S13).It is completely student-centered, which is I think an advantage, but sometimes it may be difficult for students when they work on words with complicated spelling (S14).

On the other hand, remembering the spelling of the words (productive knowledge of form) was regarded to be difficult. One participant is quoted as saying, “It was difficult for learning words with complex spellings” (S3). Therefore, 20% of the participants reported that in order to remember the target items later, learners need to review them after the parallel text practice.

Finally, the participants were asked to share whether they had something additional to say about the method. Accordingly, S5 suggested that this method could be applied not only for vocabulary learning, but also for learning grammar and

writing. In addition, S(8) anticipated more materials developed with this approach for learning a foreign language.

Chapter 5
Discussion, Conclusion and Suggestions

The purpose of this chapter is to summarize and discuss the major findings of the study in the light of the current literature. After concluding the discussion, implications in terms of methodology, theory and pedagogy are reported. Finally, the chapter ends with suggestions for further research.

Summary of the study

The present study aimed to investigate the comparative effects of consulting the COCA corpus (Experimental Group 1), parallel texts (Experimental Group 2) and an online dictionary (Control Group condition) on the participants' receptive and productive verb-noun and adjective-noun collocational knowledge. The participants of the study were first-year students studying in an English Language Teaching Department in one of the state universities in Turkey. The participants were randomly assigned to three groups, each of which received a different intervention by the researcher. The participants were taught 20 target collocations (10 verb-noun and 10 adjective-noun combinations) through three different approaches.

The target collocations were given in two sets. In each instance, the participants received the same receptive and productive tests, before, immediately after and three weeks after the intervention. In the intervention processes, the Corpus Group received a sheet on which the target collocations were provided with two blank columns on their right. One of these blank columns asked them to provide the Turkish equivalents of the collocations, and the other asked them to write a sentence using the target collocations. The purpose of the first column was to have the participants find the meaning of the target items by consulting the COCA corpus, while the purpose of the third column was to expand their productive knowledge of the collocations through practice.

Likewise, the participants in the Parallel Texts Group received a table in which there were three columns. However, in this case, in the first column, there were English sentences in which the target collocations were highlighted. In the second column, there were Turkish translations of the English sentences; however, the Turkish equivalents of the target collocations were not highlighted to make the task more demanding for the participants. The last column, left blank, asked the

participants to write a sentence using each of the target collocations to practice their productive knowledge. The participants in this group were expected to practice the collocations and derive their meaning by resorting to texts that were written in both English and in Turkish.

The Control Group, on the other hand, was asked to complete an exercise using the target items. The exercise included fill-in-the-gap sentences in which the target collocations must be placed according to their meanings. They were also provided with a space just below each gap-filling exercise to write a sentence using the target collocations.

The time allocated for each task was 45 minutes for all groups. The researcher made the Vocabulary Load Involvements similar in order to ensure that the three conditions were similar. All of the participants were asked to find the meaning of the target collocations by resorting to a different source, and they were all asked to create a sentence with the target collocations. To test their overall vocabulary acquisition, the participants were also asked to complete the Vocabulary Knowledge Scale before and after the interventions. The scores obtained from these two tests were computed to determine the collocation gains of the participants.

The research methodology employed in the current study was a quantitative research design, which adopts a reductionist view of the data by reducing the ideas into small sets such as variables to form hypotheses and research questions (Creswell, 2009). A pre-test post-test and delayed post-test design was used in this case, with the aim of comparing the effectiveness of three collocation teaching approaches (Corpus Based, Parallel Texts, and Online Dictionary (Control)) on the receptive and productive knowledge of verb-noun and adjective-noun collocations. A complimentary qualitative analysis was also carried out to examine the participants' reflections on each method, as elicited through an open-ended questionnaire. As such, the data were collected through a vocabulary size test, a vocabulary knowledge scale, receptive and productive tests, and a standardized open-ended questionnaire. The data were analyzed via SPSS 21 via descriptive statistics, Wilcoxon Signed Rank Tests and Kruskal Wallis H Tests and Paired Samples T-test. The qualitative data were analyzed through clustering the emerging themes.

The vocabulary size of the participants, who were first-year students studying in an English Language Teaching department of a state university in Turkey, was found to vary between 6000-word families to 10000-word families. The results of the statistical analysis of the data obtained from the Vocabulary Knowledge Scale given to the participants as a pre- and post-test indicated that corpus consultancy, parallel text practice, and use of an online dictionary all had a positive impact on the participants' overall collocation learning. Although no significant difference was found among the three groups on the post-test, comparisons revealed that the participants in the Corpus Group (M=84.38) performed better than the other two. Similarly, the participants' performance in the Parallel Texts Group (M=81.41) was better the Control Group (M= 75.19).

Furthermore, the total scores obtained from the pre-test and post-test on receptive knowledge of form, use and meaning were compared with the Wilcoxon Signed Rank Test to determine the effect of the three teaching methods on the participants' collocation knowledge. The results indicated significant results in the scores of the three groups, revealing that all of the groups improved significantly from each of the methods.

When the potential differences between these groups in terms of receptive collocational gains (post-test scores) were compared via the Kruskal Wallis H test, the data revealed no significant difference. These results indicate that, although the three groups' total scores elicited from the tests of receptive knowledge of form, meaning and use increased to a statistically significant level after each intervention, there was no statistically significant difference between the post-test scores of the participants.

On the other hand, when just the post-test scores of receptive knowledge of form, use and meaning from the three groups were compared separately, it was found that the receptive knowledge of meaning scores of the Corpus Group were significantly higher than those of the Control Group, while no statistically significant difference was found between the Corpus Group and the Parallel Texts Group or between the Parallel Texts Group and the Control Group.

When the delayed post-test receptive scores of the participants were compared, the scores of the Control Group were found to be significantly lower than

those of the Corpus Group. On the contrary, the analysis showed that there was no significant difference between the scores of the Parallel Texts Group and the other groups.

In determining the retention rate of the participants, the total scores elicited from the receptive post-test and delayed post-test were compared using the Wilcoxon Signed Rank Test. The scores showed that a 3-week delay in tests brought about a significant decrease in the receptive knowledge aspect of the collocational knowledge of all three groups.

Additionally, a more granular analysis was conducted by comparing the delayed post-test scores to find out whether there were statistically significant differences between the groups in terms of the receptive test for form, use and meaning. The results demonstrated a significant difference in only the receptive test for meaning, indicating that the Control Group performed statistically significantly lower than the Corpus Group and the Parallel Texts Group. However, no statistically significant difference was found between Corpus Group and the Parallel Texts Group.

As of productive scores, the total scores obtained from the productive pre-test and post-test were compared via the Wilcoxon Signed Rank Test to explore the impact of the three different teaching methods on the participants' collocation knowledge. The results were significant in the scores of all three groups, indicating that they all made significant improvements from each of the methods. Moreover, when potential differences between these groups in terms of post-test scores on the production tests were computed via the Kruskal Wallis H test, the data revealed no significant difference between groups.

A more detailed analysis was conducted separately to see whether there were differences between the scores on productive knowledge of form, use and meaning. The only difference found in the results was a statistically significant difference in the scores on productive knowledge of form, where it was found that the Corpus Group performed significantly better than the Control Group. However, no significant difference was found between the Control Group and the Parallel Texts Group or between the Corpus Group and the Parallel Texts Group.

From another perspective, the retention of productive knowledge of the collocations was tested through comparison of the total post-test scores and total delayed post-test scores of the participants. The results indicated that retention of the productive knowledge of collocations for both the Control Group and the Parallel Texts Group decreased significantly on the delayed post-test.

In comparing just the total productive scores from the delayed post-test, it was found that the scores of the Control Group were statistically significantly lower than those of the Corpus Group. Moreover, while the scores of the Corpus Group were higher than those of the Parallel Texts Group, the difference did not reach a statistically significant level.

Further analysis of each subset of the delayed post productive test showed a significant difference between the scores of the Control Group and the Corpus Group in terms of productive "knowledge of form," with the Control Group performing significantly lower than the Corpus Group. A similar significant difference was found between the Control Group and the Parallel Texts Group, indicating that the Control Group's performance on the test was also significantly lower than that of Parallel Texts Group.

When the total productive post-test and delayed post-test scores were compared to examine the retention rate of the three groups, the analysis revealed a significant decrease in the scores of the Parallel Texts Group and the Control Group, in particular. A more detailed analysis on productive knowledge of form, meaning and use was carried out in terms of retention, and the findings revealed that the scores of the Parallel Texts Group and Control Group decreased at a statistically significant level in this regard.

In terms of types of collocations, when the responses of the participants on each of the receptive and productive tests were analyzed to find out which collocation combination was used correctly more often, the results showed that the means of correctly used adjective-noun collocations were lower than those of the verb-noun collocations. When group comparisons were made to explore any potential differences, the results showed that verb noun collocations were used statistically significantly more correctly than adjective noun collocation combinations both in receptive and productive tests.

Finally, the perceptions of all the participants in each group on the interventions were elicited via a structured open-ended questionnaire. The questionnaire items asked them to evaluate their learning experience and comment on the advantages and disadvantages of the treatments they received.

Discussion

Acquisition and retention of target collocations. To gauge the participants' actual level of knowledge of target collocations and to assess their level of development over time, the VKS (Paribakht & Wesche, 1993) was used. In the initial encounter with the scale that included the possible target collocations, the participants were asked to fill in the scale items with their current knowledge of the target collocations. On the post-test, they were asked to fill in the same scale with 20 target collocations and to write a sentence with the collocations if they claimed to know them.

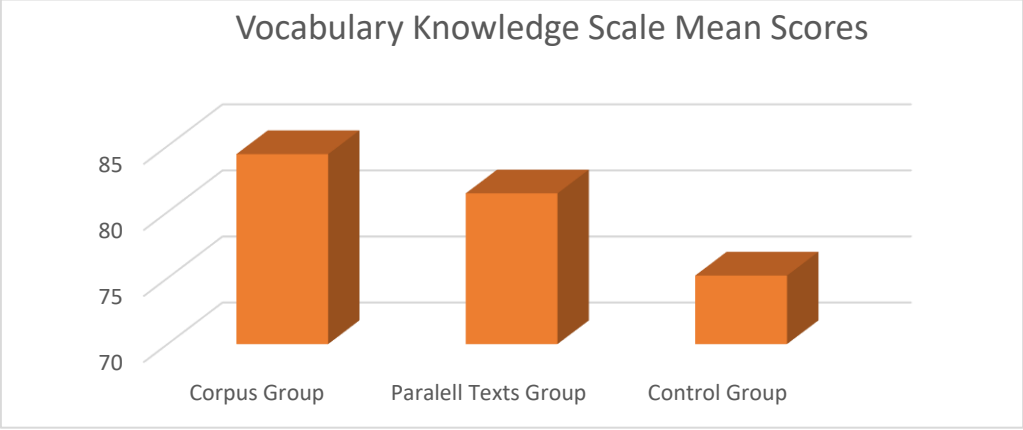


Figure 6. Vocabulary knowledge scale mean scores

The group comparisons for the post-test scores obtained from the VKS showed no statistically significant difference between the groups. One possible explanation for this result may be the fact that the participants were unwilling to exert the effort to write sentences, which resulted in them choosing the options that did not require them to write sentences using the target collocations. Although statistically nonsignificant, the means of the Corpus Group (M=84.38) and the Parallel Text Group (M=81.41) were found to be higher than that of the Control Group (75.19) (see figure 6).

The related literature indicates that word encounter is important for vocabulary learning (Laufer & Goldstein, 2004; Nation, 2001). Therefore, the higher mean scores of the Corpus Group may be attributed to exposure to multiple usage of target items, as opposed to the Parallel Texts Group and the Control Group. Prior studies that have noted the importance of concordancing in learning of collocations showed that corpora provide learners with extensive naturally occurring examples in real texts, enabling learners to discover patterns and adjust their misconceptions (Hill, 2000; Lewis, 2000; Todd, 2001; Weber, 2001). In this sense, the number of encounters may have had a positive impact on the scores of Corpus Group, as they had more exposure to the target collocations in their extended contexts than those in the Parallel Texts Group. However, the close mean scores of the Parallel Texts Group and the Corpus Group revealed that these data-driven approaches both played a facilitating role in collocational knowledge, as both groups performed better than the Control Group. Additionally, the learning gains seen in the Control Group showed that explicit instruction in collocations by asking participants to consult online bilingual dictionaries also aided them in expanding their collocational knowledge. This finding supports the view that students should spend a reasonable amount of time not only on the acquisition of a word form, but also on the meaning of the word, to be able to master it fully (Ellis, 1997).

The comparison of receptive scores. The scores obtained from the receptive tests were subjected to statistical analysis. To understand the impact of the intervention on the participants' collocational knowledge, their pre- and post-

tests scores were compared, and the results indicated a significant difference between the receptive scores of all groups.

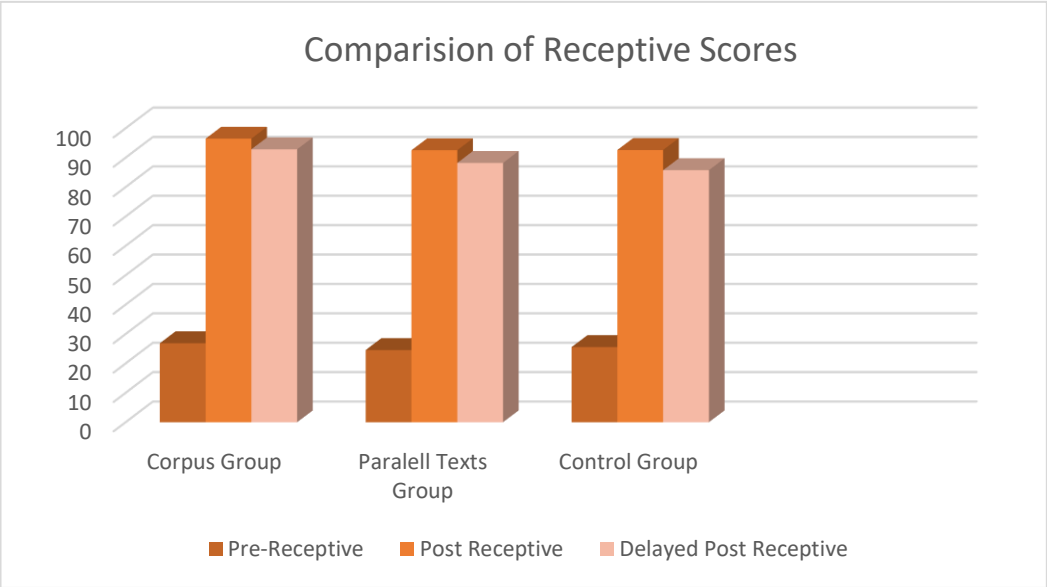


Figure 7. Comparison of receptive scores

This result showed that the participants moved from knowing nothing or little about the target collocations to exhibiting receptive knowledge immediately after the interventions. This observed result can be attributed to the proficiency level of the participants (C1+ English majors), which aided them to find the meaning and usage of the target items relatively faster than foreign language learners at lower proficiency levels. With such participants, any intervention should yield similar results. For most experimental studies, this result may yield some discussion on the potential of the interventions for learners' collocational knowledge. In this sense, the significant increase in their receptive collocation scores indicates that these three approaches were useful for raising student recognition of the target collocations. Though not at statistically significant level, the mean of Corpus Group's posttest receptive scores were found to be higher than those of other groups, showing that the participants benefited more from corpus consultancy.

However, the main concern of the study was to find out which intervention -- a corpus study or working on parallel texts -- increased the participants' knowledge of the collocations to a greater degree when compared with dictionary consultancy (the control group). Another major concern of the study was to find out which approach facilitated the recognition and retrieval of the collocations. Therefore, to

gain deeper insights into the differences between the groups in terms of their scores, their total receptive post-test scores were first compared. After this analysis, their delayed post-test results were compared. Lastly, to determine the retention rates of the three groups, an inter-group comparison of their post-test and delayed post-test scores was carried out. The comparison of the post-test and delayed post-test scores showed a significant decrease in total the receptive scores for all three groups (see figure 8).

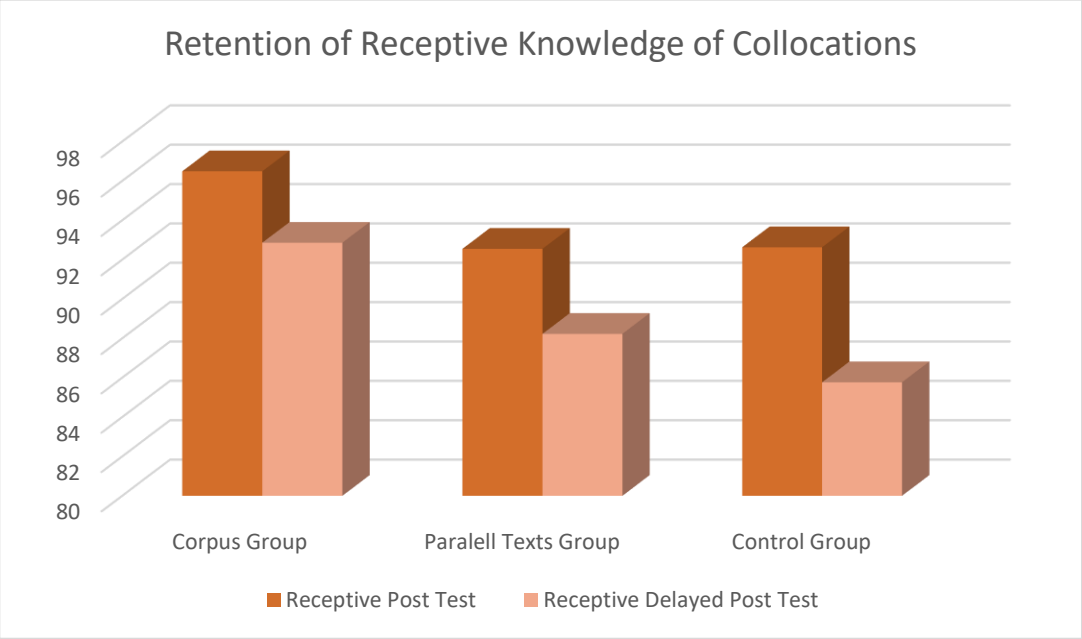


Figure 8. Retention of receptive knowledge of collocations

This result, in accordance with Chan and Liou (2005), indicated that the influence of each of the interventions on collocation learning deteriorated to some extent as time passed. A lack of recycling the target collocations may be considered as a reason for this finding, as the participants did not review the collocations after the interventions and were tested after a three-week delay after their first encounter with the target items. However, what should stand out in this study is the comparison of the delayed post-test scores, which illuminate the group that demonstrated better recall of the target collocations after three weeks. When only these receptive scores were compared, the results indicated that the scores of the Corpus Group were statistically significantly higher than those of the Control Group. The scores of the Parallel Texts Group were found to remain in between those of the other groups without signaling a significant difference between the other two groups. In line with previous studies evaluating the influence of corpus practice through concordancing

in fostering vocabulary learning (Nesselhauf, 2003; Wang, 2001), the findings revealed that the participants benefited more from concordancing than the online dictionary consultancy in terms of retention of receptive knowledge of the collocations. This result reflects those of Binkai (2012), Chan and Liou (2005), and Jafarpour and Koosha (2006), who also found that corpus-based study is beneficial for collocation acquisition.

When the scores were compared with the receptive scores of the Parallel Texts Group, the results showed that performance of this group was also better than that of the Control Group. This finding supports the work of Boulton (2010), who compared the effects of paper-based concordance materials and traditional dictionary-based materials and found that paper-based concordance exercises helped students learn the target words more efficiently than dictionary-based learning materials. In this sense, the participants in the Parallel Texts Group exerted effort to find the meaning of the collocations from their Turkish equivalents. Having the ability to see both usages (one in English and one in Turkish) of the same collocations may have facilitated their retention, in accordance with Jiang's (2000) "Lexical Representation and Development in L2" model, which holds that stimulation of L2 words is triggered by associations with their L1 counterparts. Contextual learning of the target items is another factor that can be attributed to this result. the impact of lexical inferencing from context has already been highlighted by researchers (Nation, 2013; Webb, 2007). As the participants in the Parallel Text group inferred the linguistic items from given contexts with their L1 translations, both contexts of the target items may have left more traces in the participants' receptive knowledge. As such, the effect of working on parallel texts had more positive benefit to collocational knowledge than dictionary learning, but not more than corpus consultancy.

Fine-Grained Analysis: Receptive Knowledge of Form, Use and Meaning

To reveal any potential differences between the three different subcategories of receptive knowledge, each groups' immediate post-test scores and delayed post-test scores in terms of receptive knowledges of form, use and meaning were compared separately. When immediate posttest receptive scores for form, use and

meaning were compared between groups, the results indicated that the test scores of the Corpus Group on receptive knowledge of meaning were statistically significantly higher than that of the Control Group.

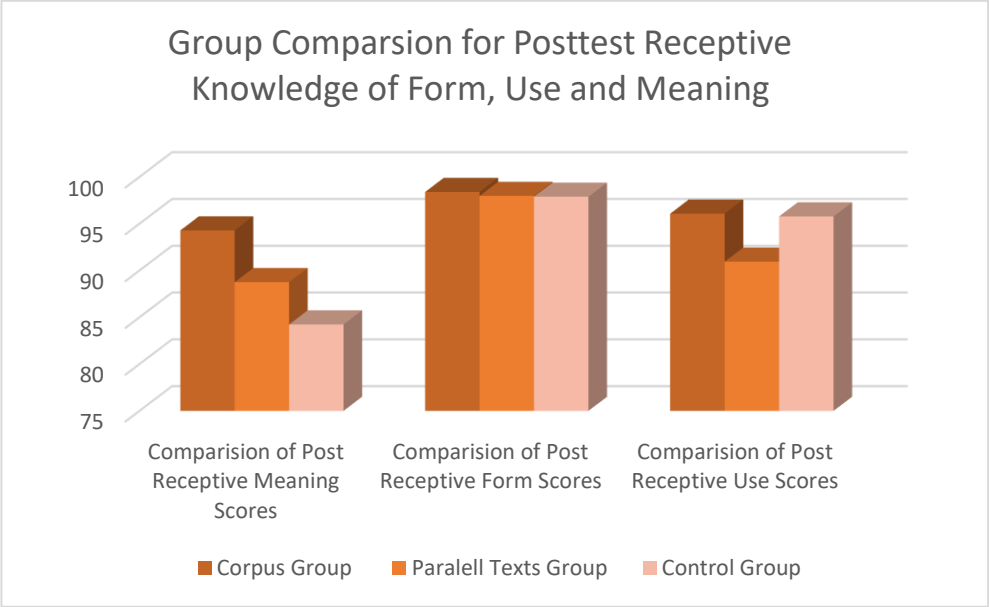


Figure 9. Group Comparison for Posttest Receptive Knowledge of Form, Use and Meaning

This result demonstrated that the participants in the Corpus Group recalled the meaning of the target items more often than the Control Group. This obtained result can also be explained with contextualized teaching through guessing, which is considered to be one of important ways of teaching vocabulary (Nation, 2001, 2013). The participants in the Corpus Group used their concentration, perseverance and reasoning skills to be able to draw the meaning from extended contexts of the target collocations, which, in turn, may resulted in more retention rate and a better performance of the Corpus Group on receptive meaning tests even three weeks after the intervention. Therefore, findings of the current study seem to be consistent with what Godwin-Jones (2018) wrote by claiming that contextualized encounters with unknown words may enhance retention as meaningful words and expressions used together make more memorable traces in learners' minds.

When their delayed post-test scores were compared, moreover, it was found that the delayed post-test receptive meaning scores of the Control Group were statistically lower than both the Corpus Group and the Parallel Texts Group.

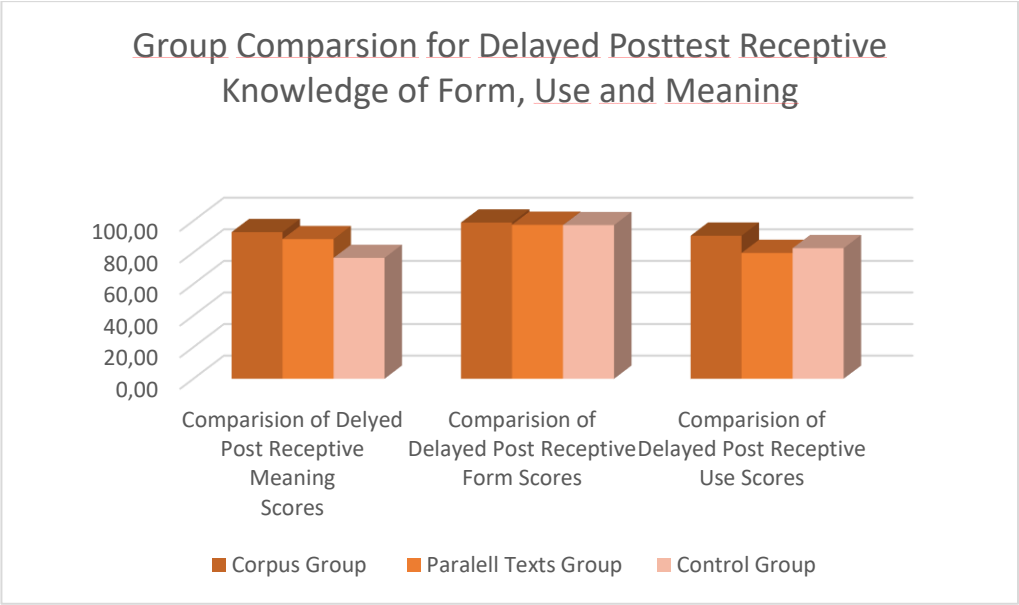


Figure 10. Group Comparison for Delayed Posttest Receptive Knowledge of Form, Use and Meaning

This finding reveals that picking up meaning of the collocations from dictionaries to achieve a task may be enough for recalling receptive knowledge of form and use, but not for retrieving meaning. Similarly, in prior studies, it has been maintained that although dictionary consultation has been thought to have many advantages, such as speed and ease of consultation and the ability to look up large numbers of words (Guillot & Kenning 1994; Laufer & Hill, 2000; Nesi, 2000b), the retention rate of newly encountered words may be questioned, as its speed and ease may not leave a traceable memory in learners' minds. As the information is most easily extracted and requires the least thought (Nesi, 2000), this may result in a hindrance in retention (Sharpe, 1995). Drawing from the explanations in the literature and findings of the current study, it can be concluded that online dictionary consultancy is relatively a less effective approach for recalling meaning of collocations when compared with corpus consultancy and parallel text practice.

Although the equal involvement load of the participants was ensured by asking the control group to achieve a task which requires a special focus on meaning and a context, they failed to retain the target collocations and performed more poorly than the other two groups in terms of meaning. This study showed that the long-term benefit of look-up from the online dictionary is limited, and online dictionary consultation may negatively affect the retention of meaning. Likewise, a separate retention analysis (see figure 10) (the comparison of the post-test and delayed

post-test scores in terms of subcategories) revealed that consulting an online dictionary was less beneficial in remembering the correct collocates of the words; the findings showed that the Control Group's receptive knowledge of use scores decreased to a statistically significant level after three weeks, while the decrease in the scores of the Corpus Group remained at a nonsignificant level. In similar vein with the results of the control group, receptive use scores of the Parallel Texts group decreased to a statistically significant level. Thus, despite similar involvement loads, this result reinforces the idea that looking up only the meaning of the collocations or practicing the collocations on parallel texts were not enough for the participants to store the correct collocation combination in their long-term memories.On the other hand, no significant difference was found for the receptive test for the meaning and form scores of all groups, indicating that the participants performed well on these tests and did not have any difficulty in remembering the receptive meaning and forms of the target items.

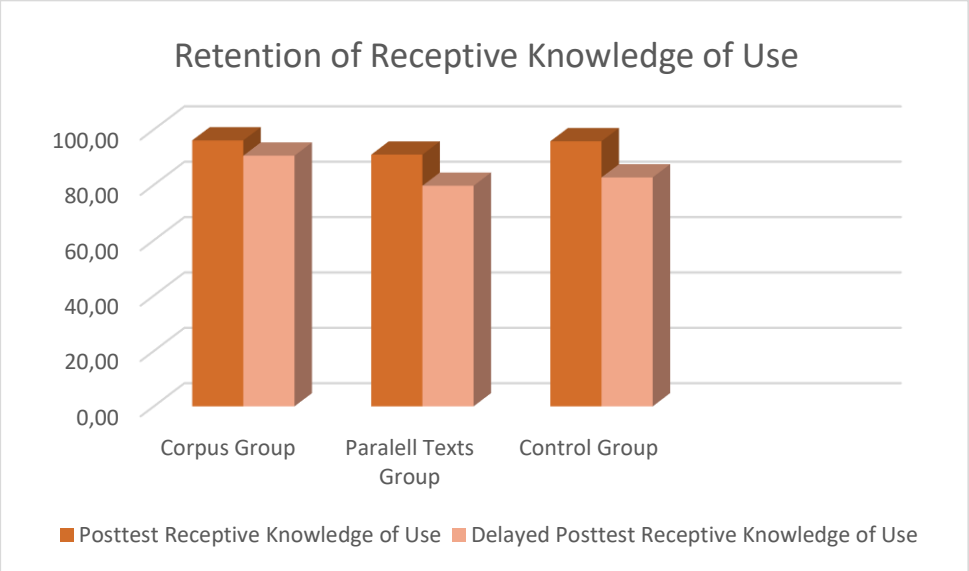


Figure 11. Retention of Receptive Knowledge of Use

The positive results for the Corpus Group can be best explained in terms of the opportunities the corpus provided to the learners. For example, the participants in this group were exposed to several instances of the collocations, which, according to Schmidt (1990), is a key factor that determines noticing and an important and sufficient condition for input to be converted to intake, resulting in learning. In this sense, the participants mastered the target items better than the other two groups.

In support of Ellis' (2001) Collocation Acquisition Model, which suggests that multiple encounters with multi-word units increase the processing ability of these units, as they tend to be taught as chunks, the findings of this study showed that the participants remembered the target items better than the other two groups.

Verb-Noun and Adjective Noun Collocation Performance at Receptive Tests

The evidence that emerged from the analysis showed that verb-noun collocation combinations were used correctly more often than the adjective-noun collocations. This outcome is contrary to some previous studies, that found verb-noun collocation achievement of L2 learners to be more prone to errors than adjective noun collocations (Peters, 2014; Wolter, 2006). In the current study, the higher level of verb-noun performance on the receptive knowledge tests may be attributed to the restricted substitutability of word constituents of target verb-noun collocations (Howarth,1998a). In this sense, the target collocations (i.e., bear fruit, lend credence, exert effort, hit puberty, show solidarity, bid farewell, inflict pain, bear witness, exert pressure, yield results) were restricted in the sense that they do not take any alternative substitution, and the individual words in the collocation combinations do not pose difficulties, as the verb constituent of the collocations were from lower word bands than the noun constituents. This may have made for easier recognition of form, use and meaning. However, this was not the case for the adjective-noun collocations, as the spellings of some collocations (e.g., meticulous attention, piecemeal approach) were difficult.

Overall, when group comparisons were made with the receptive scores of the collocations, the results indicated that the Corpus Group used verb-noun and adjective-noun collocations correctly more often than the other groups. The lowest-performing group in both collocation types was found to be the control group, supporting to the previous finding of the current study, which showed that dictionary look up experience from dictionaries do not leave a traceable memory in learners' minds.

The Comparison of Productive Scores

As with the results of the receptive scores, the results in terms of the productive scores revealed a significant difference between the pre-test and post-test for all groups, indicating that the participants progressed from knowing nothing or little about the target collocations to producing the target items correctly following the interventions (see figure 12).

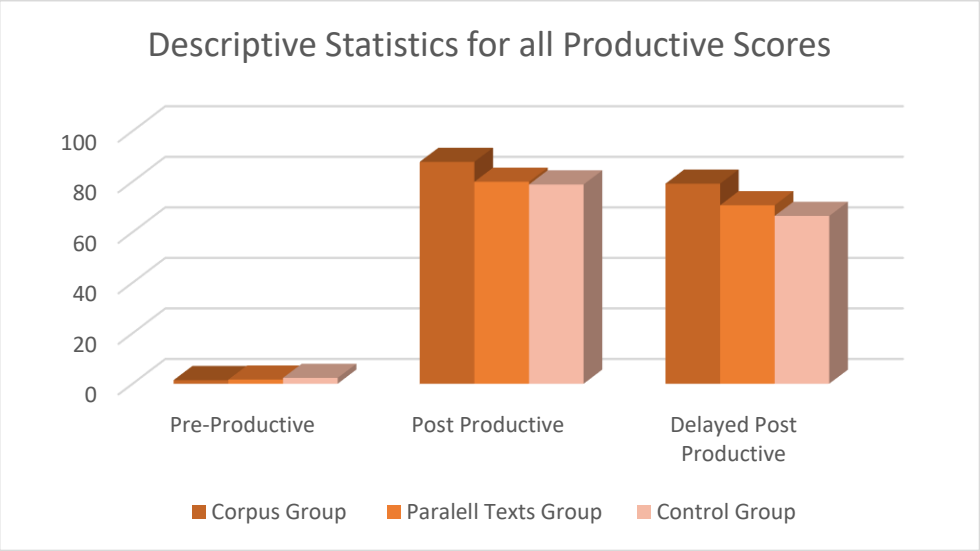


Figure 12. Descriptive statistics for all productive scores

In each of the intervention procedures, the participants were asked to write a sentence with the newly encountered target items so that they had the opportunity to practice the target collocations productively. The significant difference between the pre-test and post-test was not unexpected, as the participants were proficient enough to achieve a significant difference in their scores after several encounters with the target items.

To gain deeper insights into the differences between the groups in terms of their scores, their post-test total productive scores were first compared. After determining the results, to develop more insight into the retention of productive knowledge, the delayed post-test results were compared separately. Finally, to examine the retention rates of the three groups, an inter-group comparison of their post-test and delayed post-test scores was compared.

The total productive post-test scores of the groups were compared, and the results indicated no statistically significant difference between groups. This result

may stem from the fact that the participants received the test immediately after each intervention, which implies that they did not have difficulty in retrieving the productive knowledge of the target collocations. However, the delayed post-test results revealed that the mean score of the Corpus Group was found to be higher than the other two groups, which indicates that the participants in the Corpus Group were more successful in the written production of the target collocations than the other two immediately after the intervention (see figure 13).

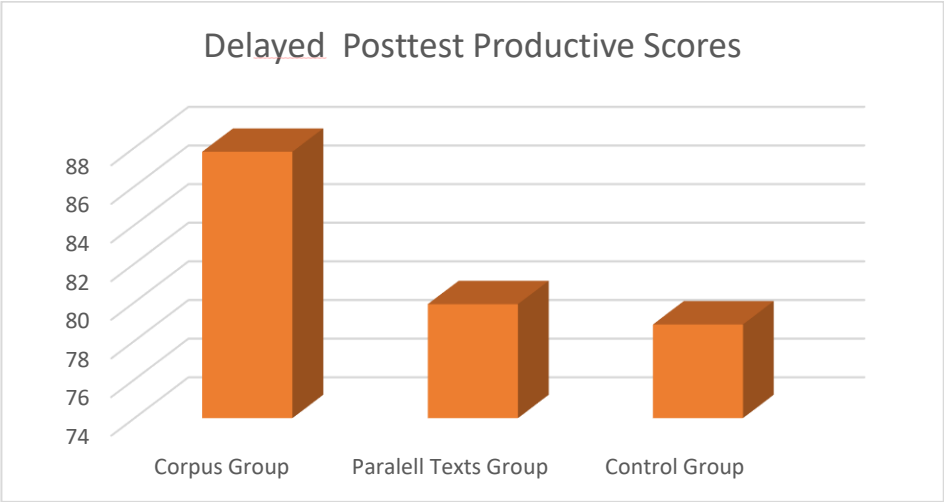


Figure 13. Delayed posttest productive scores

Productive knowledge, which calls for deeper knowledge of a word, has been considered to be acquired later than receptive knowledge and to encompass receptive knowledge within it (Web, 2013). In this sense, the receptive scores of the participants can be considered as a mirror for their productive knowledge, as the literature informs us that receptive mastery is achieved before productive mastery (Nation, 2013). Therefore, acquisition of productive knowledge of the target collocations can be regarded as more difficult and time consuming than learning receptive knowledge, which means that the group having more receptive knowledge of the target items may perform better on the productive test. Additionally, some studies investigating the relationship between receptive knowledge and productive knowledge found a strong correlation between these two knowledge types. (Xia, 2007; Zhou, 2010) That is, the higher bands in receptive size call for a better productive vocabulary size. Therefore, the higher mean scores on the receptive tests on the part of the Corpus Group may imply that their performance would be relatively better on the productive tests, as well. With respect to this hypothesis, when only the delayed post-test scores were compared, it was found that the control

group's scores were significantly lower than those of the Corpus Group. This finding broadly supports the works of Cobb (1999) and Kaur and Hegelheimer (2005), who also found that corpus concordancing groups outperformed control groups in terms of recalling the target items while producing them through writing. The possible reason behind this, as highlighted by Braun (2005) and McEnery and Xiao (2011), is that the participants in the Corpus Group consulted concordance lines, which offered them authentic contexts for the target items, enabling them to derive their meanings, which in turn aided them in forming better connections and storing them in their long-term memory. On the other hand, the control group only consulted the bilingual online dictionaries, which may not have created a traceable memory due to the speed and ease of engagement (Nesi, 2000).

Although the delayed post-test productive mean scores of the Parallel Texts Group were higher than those of the control group, no significant difference was found between the groups. However, the higher performance of Parallel Texts Group on the productive test after a three-week delay may be discussed in terms of the fact that dictionary consultancy may not always allow learners to find the exact meaning of multi-word units, leaving the learners with some ambiguities and resulting in failure to store the target items in long-term memory. On the other hand, the parallel texts provided learners with well-clarified collocations in both English and Turkish, which may have yielded better retention. As such, when the Corpus Group and Parallel Texts Group were compared, no statistically significant difference was found between them.

When the retention rates of the groups were calculated by comparing of the post-test and delayed post-test productive scores, the results revealed a statistically significant decrease in the scores of both the Parallel Texts Group and the Control Group (see figure 14)

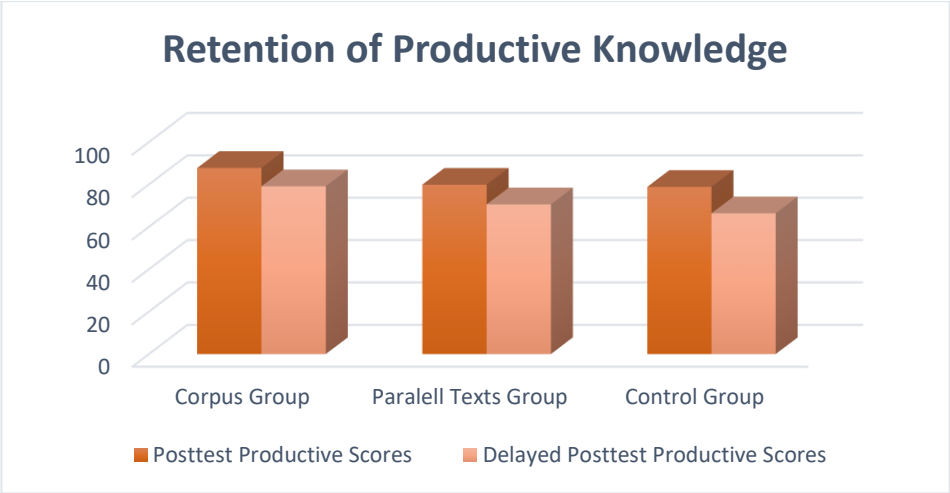


Figure 14. Retention of Productive Knowledge

This is a particularly important result that must be discussed in detail. Namely, because the results of the study showed that the retention rate of the Corpus Group remained higher than the other two groups, this indicates that the corpus practice helped learners gain and retain the collocational knowledge. On the other hand, the decrease in scores in the other two groups indicates that the participants' productive collocational knowledge could not be facilitated through working on parallel texts and consulting dictionaries. This finding confirms the work of Cobb (1999) and Kaur and Hegelheimer (2005), who demonstrated that corpus consultancy facilitates receptive knowledge of words at all levels and that receptive knowledge can be transferred to controlled production in novel contexts.

Fine Grained Analysis: Productive Knowledge of Form, Use and Meaning

Post-test and delayed post-test scores for productive knowledge of form, use and meaning of the participants were computed to get better insights into the achievement of the groups in these aspects of collocational knowledge. The post-test comparisons showed a statistically significant difference between the productive knowledge of form scores of the Corpus Group and the Control Group. (see figure 15)

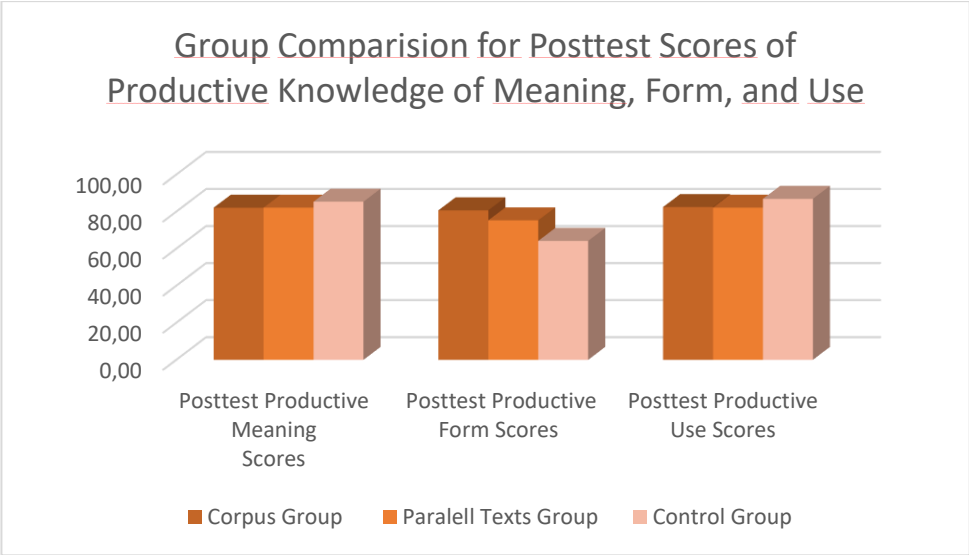


Figure 15. Group Comparison for Posttest Scores of Productive Knowledge of Meaning, Form, and Use

Although no significant difference was found between the Parallel Texts Group and the Control Group, the mean score on the Parallel Texts Group's productive knowledge of form test was found to be higher than that of the Control Group. In this sense, drawing from Nation's categorization of word knowledge, knowledge of form was presented as the ability to correctly spell the words. This ability was found to be statistically significantly lower in the Control Group, but non-significantly lower in the Parallel Texts Group than the Corpus Group. The reason behind this result may be that the participants in the Corpus Group encountered more instances of the target items than the other two groups, which enhanced their ability to remember the correct spellings.

In the comparison between the delayed post-test scores of the three groups, the results indicated that the scores on productive knowledge of form from both the Corpus Group and the Parallel Texts Groups were statistically significantly higher than those of the Control Group (see figure 16).

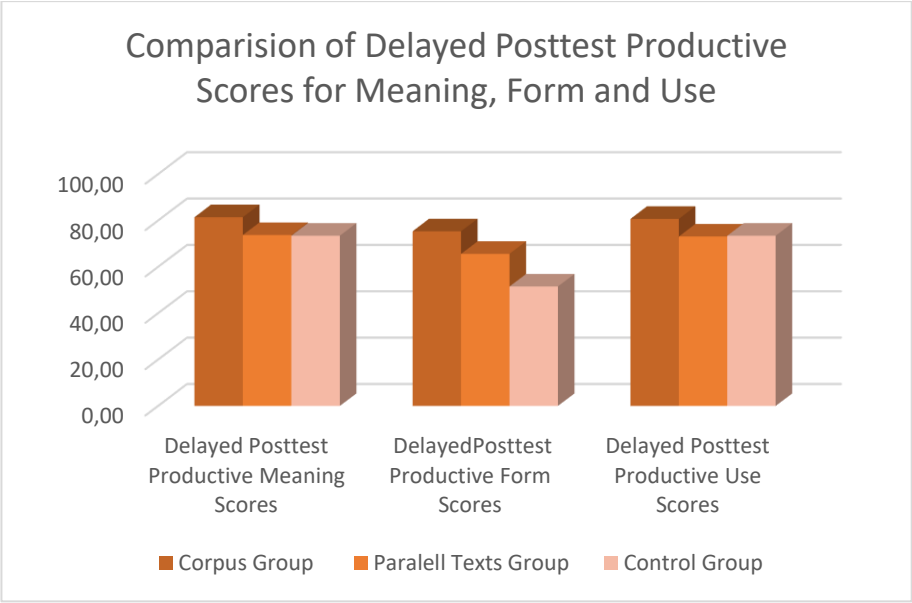


Figure 16. Comparison of delayed posttest productive scores for meaning, form and use

This result showed that online dictionary consultancy did not provide the participants with the sufficient ability to remember the correct spelling of the target items; it is likely that only one or two encounters did not support their performance on the productive test.

Furthermore, when the retention of these knowledge types was computed by comparing the post-test and delayed post-test scores, it was found that both the scores of both the Parallel Texts Group and the Control Group on productive knowledge of form, use and meaning decreased at statistically significant levels after three weeks' delay. This result indicates that the level of exposure in consulting parallel texts and dictionaries was ineffective in aiding the participants to produce the target collocations in written form.

Productive Verb-Noun and Adjective-Noun Collocation Performance

In the area of productive verb-noun and adjective noun collocation performance, correct production of the target items was observed to pose difficulties for learners in the current study. When the receptive scores and productive scores were compared, it was found that productive knowledge lagged behind receptive knowledge. In addition, similar to the receptive scores, the verb-noun collocation productive scores of the participants were found to be more correct than that of the adjective-noun collocations.

Moreover, when comparisons were made between the groups, it was found that the Corpus Group produced adjective-nouns statistically more correctly than the other groups. However, no significant difference was found between the Control Group and the Parallel Texts Group.

Perspectives of the Experimental Groups

To elicit the perspective of the participants in the experimental groups, their views were examined through structured open-ended questionnaires at the end of the interventions. The recurring themes that emerged from their responses were compiled under the following categories:

Benefits and Drawbacks of Corpus Consultation. One of the common themes derived from the responses given by the participants to the structured open-ended interview was found to be the perceived value of pedagogical use of corpora in collocation learning. This perceived value was highlighted by specifically focusing on authenticity, the number of encounters, the ease of access, and autonomy of learning. An additional theme concerned the difficulties encountered while working with concordance lines.

***Perceived Authenticity*.** The literature on corpus consultancy particularly emphasizes the authenticity of the sources in corpus software. In line with what is highlighted in literature, the perspectives of most of the participants lend support to the view that the language data provided in a corpus is essential, as it offers the unique characteristics of authentic language, providing learners with information on target items and their surrounding words. Furthermore, some of the participants expressed their confidence while working with the data, as they saw real instances of the language produced by native speakers. This perceived confidence can be best explained by the proficiency level and area of study of the participants. In this respect, they were majoring in English, and their level of English proficiency was high, which means that they have been exposed to many language sources, such as textbooks and reading materials. On the other hand, most of these, rather than being authentic, are adopted to specific language levels. When the participants had a chance to work with a corpus, they seemed to find it a truthful representative of real language data.

***Number of encounters*.** As aforementioned, with advancements in computer technology, storage of language data has become more efficient, so that a corpus may contain hundreds of millions of words. This wealth of language data allows corpus users to see salient instances of linguistic data. Recognizing this strength of a corpus, most of the participants anticipated corpus consultancy as an effective approach to viewing various instances of the same patterns in concordance lines. The opportunity of being exposed to multiple usages of the target collocations, according to some of the participants, aided them in increasing their experience with the collocations. This led to better cognitive involvement, which in turn, resulted in better retention.

***Perceived Ease of Access and Autonomous Learning*.** Having near-constant access to the internet, as well as the availability of corpus searches through mobile phones, may have made the participants feel at ease with the use of concordances; some of the participants reflected on the advantages a corpus offered them. As with Willis (1990), who asserted that the use of a corpus allowed learners to easily scan, locate and list target items, portraying which word goes together with other words, he patterns followed by those words, the propositions used with those words, and so on, the participants in the present study reported that they could easily list a large number of instances of the target items and could limit their queries to specific genres. At the end of their search, they had a very long list of the instances of the target item with which they could induce lexico-syntactic patterns and make inferences on the meaning of the target items by looking at their surrounding words.

Autonomous learning opportunities were also mentioned by most of the participants, who expressed that by means of concordance outputs, rather than needing to consult their teacher, they could consult the corpus when they felt uncertain about the use of a specific lexical item. This outcome reflects the claim of Johns (1991), the originator of the DDL approach, that when using corpora, learners act as language researchers, proceed through various instances of authentic patterns, and become independent learners.

***Intent to Use Corpus in the Future*.** Recognizing that the corpus offered them an extensive source of authentic language data in different genres, the participants expressed their gratitude for learning to use it, especially for formulaic

units. This finding is in accord with Tsai (2011), the majority of whose participants were content with corpus consultancy and believed that this tool aided them to improve their receptive and productive collocation knowledge. It was also found that most of the participants in the Corpus Group in the present case felt confident in using corpus sources in their future studies. The respondents seemed to take advantage of the corpus, which provided a large number of instances of the collocations b8y taking into account the lexico-syntactic relationships of the target items while inferring their meaning. Their attempts to examine the connections of the words with their extended context reveals their awareness of the benefits of concordancing. Moreover, when their post-test and delayed post-test receptive and productive scores were taken into account, it may be possible to claim that there was an overlap between the views they shared and their actual performance, since the participants in this group outperformed the Control Group nearly in all cases and the Parallel Texts Group in some instances.

***Perceived Retention*.** Most of the participants referred to the advantages of corpus consultancy by stating that their retention of the collocations was facilitated, as they worked intensely with the language input as they gave attention to the many instances of collocations and their extended contexts. This perspective complies with the evidence taken from their scores, which showed that the participants in the Corpus Group recalled the target collocations on the delayed post-test and could produce them better than the other groups.

Difficulties encountered in corpus consultancy. Similar to the participants of Chan and Liou's (2005) study, at the beginning of the intervention, the participants of this study were less motivated about inferring the meanings of the collocations from concordance lines, claiming that it was time-consuming and difficult. Afterward, however, they reported that as they became more acquainted with the corpus and concordance lines, the corpus data seemed to be less overwhelming. This difficulty can be explained in that it was their first encounter with concordance lines, which constitutes an extensive source of language data, and they were required to exert effort to induce the meaning of unknown collocations. However, as they gained experience in searching the corpus, they may have felt more confident about inferring meanings. On the other hand, some of the participants expressed that this

approach took too much time and energy on the part of the learner. Moreover, another concern expressed by the participants was the “text difficulty” of some of the contexts, as some of the participants complained about not understanding the surrounding words, which hindered them from inducing the meaning of the target items. However, they overcame this difficulty by checking other contexts to find the meanings. Likewise, in his study of the effects of authentic materials in EFL classrooms, Sample (2015) found that text difficulty may be a key factor that demotivates students while working with authentic materials. Drawing from these perspectives, as well as the results of the pilot study, in which lower-level learners suffered from the same problem, it can be inferred that learners with lower proficiency may not benefit as well as more proficient learners from the authentic language data served in a corpus.

Parallel Texts Group

***Perceived ease and autonomy of learning*.** Most of the participants found working with parallel texts easier and less labor-intensive, as they were provided with the Turkish equivalents of the target items in another context. In this sense, they reported that seeing the Turkish equivalents of the unknown target items with their surrounding context increased their confidence about the exact meanings, whereas dictionaries may sometimes fail to offer the exact meaning of some multi-word units or expressions in the source language. Therefore, it can be concluded that the participants considered that parallel text practice minimized the ambiguities experienced in finding the meanings of the collocations.

Another factor that was pointed out in terms of perceived ease of use was the opportunity to make comparisons between texts. This was considered to be advantageous, with some participants reporting that they could make linguistic and interlingual comparisons, which could increase other aspects of collocational knowledge. In accord with Jiang (2000), the ability to make comparisons might aid them in overcome L1 transfer problems, as they tended to translate the items into Turkish to make sense of them. By encountering the parallel texts, they could easily see the meaning of the units and how they were used in different sentences, which prevented them from arriving at incorrect definitions. Additionally, with the ability to

see five instances of the target collocations in different contexts with their translations, the participants also reported that the parallel texts allowed them to see whether the target items' meanings differed in different contexts.

Furthermore, as parallel text practice was student-centered, and no assistance was given by the researcher, the participants reported feeling more independent. Such experience raised their awareness of the advantages of making linguistic comparisons between texts with respect to their L2 knowledge.

***Perceived retention*.** Concerning retention, some of the participants argued that the ease of learning the Turkish equivalents of the target items might lead to poor performance in recalling the items later. In other words, they were concerned about retention of the items in their later performance. In this respect, some of the participants were concerned about remembering the spelling of the target items when they were asked to write them, as they thought the practice was not sufficient to store the spelling of some of the words in their long-term memory. Therefore, they felt the need to review the target items after their first encounter in the parallel texts.

***Intent to use the approach in the future*.** Nearly all of the participants reported that they intended to use the approach as a vocabulary learning strategy, as they found it to be manageable and easily adapted for individual studies. This tendency may be partly explained by the ease they felt while studying the target items. In this regard, they may have seen the potential of parallel texts as offering opportunities for cross linguistic, pragmatic, or semantic comparison between languages.

***Perceived disadvantages*.** In terms of disadvantages, the availability of the Turkish equivalents of the target items was been considered by some of the participants to make the process too easy, resulting putting forth less effort to understand the meaning of the target items. This perception should be interpreted with caution, because these participants shared this as a basis for their lower rate of retention after the three-week delay.

Comparison of Themes Found in the Participants' Perceptions

One of the clear differences that the participants perceived between the two groups concerned the retention rate of the target items. While the Corpus Group

claimed to store the target items in their long-term memory more effectively by consulting the corpus to learn collocations, the Parallel Texts Group reported otherwise. The reason behind the perception of the Corpus Group may be the effort they made to induce meanings from multiple contextual examples of the target items. In this sense, the complex cognitive engagement by the participants may have triggered more thought, and thus better retention. On the other hand, the participants in the Parallel Texts Group must have exerted less effort, as they were provided with the Turkish equivalents of the target items.

Another issue that was pointed out in the perceptions of the Corpus Group was the ability to work with multiple incidences of authentic target language items, which was thought to be very effective for their learning. On the other hand, due to the limited number of encounters in the parallel texts, the participants in the Parallel Texts Group did not mention such an advantage. It is likely that the participants in the latter group were not surprised to see only five instances of the target items with their L1 translations. On the other hand, working with parallel texts was found to be easier and less labor intensive, while the participants in the Corpus Group found corpus consultancy more time consuming and difficult. In addition, the participants in the Parallel Texts Group reported feeling more confident about the meaning of the target items, as they had opportunity to see the exact meanings in the translations, while those in the Corpus Group mentioned some ambiguities in finding the meanings of the collocations. This issue supports the claim made by Schmitt (2008), who stated that learners' linguistic inferences from multiple contexts may sometimes be erroneous, and learners may induce inaccurate meanings.

Pedagogical Implications of the Study

Implications for Classroom Teachers: The essential role that collocations play in learning a foreign language has been presented by many studies in literature. Additionally, in line with what Bahns and Eldaw (1993) found in their study, both this study and other related studies revealed that in spite of a huge number of vocabulary size that L2 learners have, they still have some problems with multi word units, which shows that collocational knowledge does not expand with vocabulary size in parallel. This fact makes increasing collocational competence of learners a separate aspect of development in L2 contexts.

However, in spite of a large body of research on teaching collocations, collocation learning still remains as a problematic domain for even highly proficient learners. Therefore, how these multi-word units are learned and the underlying factors that interfere with learning them must be illuminated, and greater insights are needed, in order to take more effective instructional steps. With this in mind, this study aimed (1) to find the instructional impact of two data-driven approaches on developing collocational knowledge and (2) to explore participants' perspectives on corpus consultancy and parallel texts in learning collocations. Depending on the results of the study, some implications for L2 pedagogy can be drawn regarding the collocation instruction.

Considered to be the second-best source after textbooks for introducing new lexical items and informing learners on their meaning and use (Schmitt, 2010), language teachers are responsible for equipping their learners with effective strategies to learn more vocabulary items and store them in their long-term memory. In addition, teachers should develop their learners' intuition about collocations by explicitly directing their attention from individual words to multi-word units. In this respect, textbooks and classroom activities may sometimes be insufficient for triggering the learning of multi-word units, as the number of encounters with collocations in such resources may be limited. From this perspective, one of the most important findings of this study was that explicit instruction plays an essential role in collocation learning as directing conscious attention of the learners on the target collocations that can be considered to be complex and undistinguishable. As suggested in the literature, collocations should be made salient to foreign language learners, as learners usually do not notice word combinations and see them rather as single words. However, once the collocations are explicitly presented as a whole, it becomes easier for learners to notice and process them in their memories. As evidenced from the pre-test and post-test scores of both the experimental groups and the control group, these three approaches made for effective learnings. Therefore, designing explicit teaching materials accompanied with attention directing activities would help learners develop an awareness of receptive and productive knowledge of the collocations.

Learners' active engagement in processing collocations by analyzing their form, use and meaning with the help of a large number of encounters is also advised to the teachers. Therefore, another important implication of the study revealed that knowledge of collocations can be facilitated by corpus consultancy whose effectiveness has been explained in detail in the related literature. In line with these studies, the present study revealed that learners who consulted a corpus outperformed their counterparts both receptively and productively, indicating that language teachers of English should take advantage of corpus tools and teach their learners to use them effectively. If learners are completely unfamiliar with corpus, gradual encounter with authentic corpus is suggested for learners above intermediate levels. Some steps may be taken to familiarize learners with what corpus can offer to them. Example activities below can be done in classrooms:

- ✓ Asking students to guess the most frequent collocates of a word by giving a node word such as "have" and leading them to make queries to find the mostly used noun collocates of "have".
- ✓ Guessing collocates of a given word by making corpus queries
- ✓ Search for suffixes can also be made in BNC/COCA corpus by placing asterix, learners may be asked to find suffixes of a given word
- ✓ Searching for unknown collocations and drawing meaning form concordance lines or their extended contexts.

Bearing in mind that inadequacy of classroom equipment or some physical characteristics of the classes may prevent taking advantage of corpus consultancy, it is advisable for teachers to make use of paper-based concordance outputs as they can also offer multiple usage of the same item in horizontal lines as there are studies demonstrating advantages of paper-based corpus concordance lines as well.

The current study has, on the other hand, highlighted that a corpus that is compiled with authentic productions of native speakers may pose some difficulties for lower-level learners. In such cases, teachers may develop their own corpora with lower-level English and motivate their learners to work with concordances of these special corpora. As authentic corpora offered online consist of a great number of written and spoken authentic language data, teachers can also form their own special corpus by gathering data from these corpora by selecting and compiling

more comprehendible but authentic sentences and asking learners to analyzing the target items. Additionally, they can also use graded reader texts to compile a corpus but, they need to be attentive as such texts may contain limited number of multi-word units, in case of a such event, they may make some adjustments such as adding more collocations and making them more salient in the data. These types of corpora can also facilitate word learning, given that the frequency of encounters is considered to be an important factor in learning (i.e., the frequency effect noted by Ellis (2002). Recalling that in order to acquire a word, a learner needs to encounter it 5 to 16 times or more (Nation,1990), teachers must compile their corpus with close attention to including at least 5 instances of the target items.

Teachers should also bear in mind that making corpus queries and trying to induce meaning from corpora were perceived to be labor intensive and time-consuming by the participants, who pointed out the ease of looking up entries in dictionaries and finding their equivalents in their L1. However, considering that this endeavor contributes to learning, teachers should equip learners with corpus consultancy skills, so that they can independently use such sources in their later studies. In this respect, researchers have suggested adequate training on corpus consultancy skills, starting with smaller corpora with limited searches and moving to larger corpora with more general searches (Bernardini, 2000; Kennedy & Miceli, 2010). This can be accomplished in light of O'Sullivan's (2007) proposal for developing “corpus consultation literacy,” which, according to Boulton (2010), involves a considerable array of cognitive skills that may promote DDL. In this sense, acquainting learners with such sources and skills would raise more autonomous learners.

Drawing learners’ attention to collocations through concordance lines and parallel texts were found to raise receptive knowledge. The insights gained from this study in this regard may aid materials developers, who can implement separate collocation activities that can be achieved through these two approaches or add more involvement factors to the activities to achieve better retention. The current study has also shown that, besides the widely acknowledged advantages, working on parallel texts has some disadvantages. With this in mind, it is recommended that teachers use parallel texts to increase their learners’ awareness by providing them with Turkish equivalents of English texts consisted of multi-word units or essential

expressions. However, they also should be mindful of recycling the same target items in later activities, as the current study has shown that participants were not successful in the controlled productive tests. The current study has also shown that dictionary consultancy for learning multi-word units is not enough for learners to process the target items in their long-term memories, as neither the receptive nor the productive knowledge of some of the collocations was recalled on the delayed post-test. Therefore, it is recommended that dictionary consultancy should be accompanied with additional materials to clarify ambiguities on the meanings of multi-word units. Otherwise, dictionary consultancy alone has not been observed to be an effective approach for collocation learning.

The current study has pointed out that receptive knowledge has been gained faster than the productive one. That is, the mean scores of the receptive knowledge tests were higher than that of the productive ones indicating that more practice should be made to facilitate production of the target items as the development of productive knowledge is seemed to be more complex. Therefore, recognition activities should be complemented with some cued output activities to aid learners incorporate newly learnt collocations into their productions, in other words, comprehension and production activities should be integrated to expand both receptive and productive knowledge of the words.

Implications for Teacher Education: The use of technology in L2 classrooms to add quality of teaching and learning have increased over time and technology-based instruction has become central concern of many countries in the world. In line with this concern and to add more to the quality of collocation instruction in Turkey, the current study focused on using a web- based concordance tool, complied a parallel texts corpus and consulted online dictionary. All of these three interventions were achieved through the use of current technology as the materials used to gather data were developed with the help of it. In this regard, based on better performance of the corpus group, the main implication that can be drawn from the study was that language teachers should be sufficiently qualified in integrating technology into their classroom and they should be informed on current trends in language education which include technological advancements. However, they also need to be aware of the fact that different not all technological materials offer same advantages, so teachers should know utilities of technology. For example, the corpus consulted in the current study must be learnt thoroughly and

taught to learners as clear as possible. To do that, teachers should allocate enough time to learn how to make queries in corpus. Although, teacher education programs have started to offer İnstructional Technology Design courses in the last decades, there are still many teachers who fail to integrate technology in their classes. For this reason, the number of in-service educations should be increased to raise more digitally literate teachers.

EFL pedagogy needs to equip learners with need, skill, resources, and awareness to learn vocabulary; therefore, the awareness of prospective teachers should be both raised more on the importance of multi-word units, and they need to be encouraged more to establish and strengthen the collocational links in their lexicon, which would result in better instructions in their future classrooms.

Given the prevalence of easily accessible online sources, facilitating self-directed learning should be another concern of the teachers. Learners' critical awareness should be raised, and their attention should be attracted with some pedagogical actions, which require sufficiently qualified teachers who can train their students with current language learning strategies. Teachers should receive more comprehensive picture of how collocation instruction is mediated by strategies and teach their learners the most effective ways when learning collocations.

Conclusion and Suggestions for Further Research

The essential role attached to the role of the collocations in L2 has been noted in different parts of the current study. With the aim of finding a better way of collocation instruction, the study examined the changes that occurred in the process of learning the collocations through different interventions. These changes were measured at two levels: receptive and controlled productive knowledge. The measurements were taken from two experimental groups and one control group, before, immediately after and three weeks after the intervention. To assess the effectiveness of the interventions on the learners' collocational knowledge, comparisons were made both within and between groups.

When overall performance of the participants is considered, it was found that explicit teaching of collocations increased their collocational knowledge. The group comparisons showed that most of the scores of the three groups did not differ

significantly immediately after the interventions. However, the Corpus Group was found to outperform the Parallel Text Group and the Control Group on the delayed post-tests, indicating that retention of the target collocations was achieved more effectively in this group. The extent of the progress achieved by the Corpus Group on both the receptive and productive tests was notable, lending support to the efficacy of corpus consultancy in terms of increasing EFL learners' collocational knowledge of multi-word units. The scores of the Control Group remained at a lower level on both the post-tests and the delayed post-tests than that of either of the experimental groups. These results indicated that online dictionary consultancy leave less traceable memories in learners mind, which should be taken seriously in collocation instruction.

With respect to the receptive and productive knowledge of the verb-noun and adjective-noun collocations, comparisons were made between and within groups. The results indicated that both adjective-noun and verb-noun scores were higher on the receptive tests than the productive ones. Additionally, the verb-noun collocation combinations were found to be used correctly more often than the adjective-noun collocations.

To conclude, few studies on collocation learning have revealed the full potential of corpus consultancy on collocation earning in Turkey (Altınok, 2000; Gencer, 2004; Ördem, 2005; Salihoğlu, 2019). Additionally, to the researcher's knowledge, no study in Turkey in the field of foreign language education has focused on working on parallel texts to expand the collocational knowledge of L2 learners. However, some studies have been conducted on the effect of online dictionaries in EFL classrooms, but these were confined to teaching only individual words. As such, the findings of current study contribute to foreign language education with respect to vocabulary learning research in Turkey, as well as worldwide. As with the current study, further studies should be conducted to compare the results of different teaching approaches.

Since the current study mainly focused on verb-noun and adjective-noun collocation combinations, it would be useful for future research to explore other collocation combinations such as verbs+ propositional phrases, or verb + adverb. To get gain better insights into collocation learning, cross sectional studies can be conducted with learners with different levels receiving different interventions, which, in turn, would yield broader results for collocation learning and instruction.

Additionally, more qualitative studies exploring language teachers' perceptions of teaching collocations, their actual classroom implementations, or their attempts to teach multi-word units should be conducted. As the current study revealed that despite of explicit instruction and practice on collocations, the participants' productive knowledge of collocations remained to be lower than their receptive one, more studies, specifically focusing on increasing productive knowledge of collocations can be conducted. In this manner, more effective collocation teaching and learning approaches may be brought to light.

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APPENDIX- A: Vocabulary Knowledge Scale (Paribakht & Wesche, 1996)

Please look at the following list of collocations and decide how well you know each collocation and mark A,B,C or D. If you mark A, please write its meaning in Turkish and write a sentence with it.

A: I know what this phrase means, and I can use it in a sentence.

B: I know what this phrase means, but I'm not sure how to use it (please write meaning).

C: I've seen this phrase before, but I don't know what it means.

D: I've never seen this phrase before.

	A (write a sentence)	B (write its meaning)	C	D
Alleviate poverty				
Leave vacant				
Bid farewell				
Express gratitude				
Feel inferior				
Inflict pain				
Stay sober				
Withhold information				
Deter crime				
Disclose information				
Distract attention				
Exert pressure				
Exert influence				
Exert control				
Bear witness				
Bear fruit				
Assign blame				
Spark controversy				
Make compromise				

Take exception				
Launch attacks				
Promote democracy				
Yield results				
Pursue career				
Withdraw money				
Resist change				
Deliver baby				
Apply pressure				
Natural affinity				
Controversial issue				
Intrinsic value				
Intrinsic motivation				
Positive outlook				
Meticulous attention				
Erratic behavior				
Maternity leave				
Innate ability				
Sobering thought				
Wreak havoc				
Prolific writer				
Hourglass figure				
Placebo affect				
Slender figure				
İllicit drug				
Vicious Cycle				
Inmate population				
Tentative agreement				
Yield results				
Excruciating pain				
Distress signal				
Subversive activities				
Rigorous training				

Become ubiquitous				
Noxious fumes				
Considerable amount				
Withdrawn behavior				
Virtual community				
Sheer scale				
Factual information				
Excruciating pain				
Hit puberty				
Budget deficit				
Lend credence				
Bear hug				
Voracious appetite				
Upright position				
Piecemeal approach				

APPENDIX- B Vocabulary Size Test

Circle the letter a-d with the closest meaning to the key word in the question.

1. SEE: They **saw** it.
   a. cut
   b. waited for
   c. looked at
   d. started

2. TIME: They have a lot of **time**.
   a. money
   b. food
   c. hours
   d. friends

3. PERIOD: It was a difficult **period**.
   a. question
   b. time
   c. thing to do
   d. book

4. FIGURE: Is this the right **figure**?
   a. answer
   b. place
   c. time
   d. number

5. POOR: We are **poor**.
   a. have no money
   b. feel happy
   c. are very interested
   d. do not like to work hard

6. DRIVE: He **drives** fast.
   a. swims
   b. learns
   c. throws balls
   d. uses a car

7. JUMP: She tried to **jump**.
   a. lie on top of the water
   b. get off the ground suddenly
   c. stop the car at the edge of the road
   d. move very fast

8. SHOE: Where is your **shoe**?
   a. the person who looks after you
   b. the thing you keep your money in
   c. the thing you use for writing
   d. the thing you wear on your foot

9. STANDARD: Her **standards** are very high.
   a. the bits at the back under her shoes
   b. the marks she gets in school
   c. the money she asks for
   d. the levels she reaches in everything

10. BASIS: This was used as the **basis**.
    a. answer
    b. place to take a rest
    c. next step
    d. main part

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1 The test is created by Paul Nation, Victoria University of Wellington, and found at http://www.lextutor.ca/. This test is freely available and can be used by teachers and researchers for a variety of purposes.

Second 1000

1. MAINTAIN: Can they **maintain** it?
   a. keep it as it is
   b. make it larger
   c. get a better one than it
   d. get it

2. STONE: He sat on a **stone**.
   a. hard thing
   b. kind of chair
   c. soft thing on the floor
   d. part of a tree

3. UPSET: I am **upset**.
   a. tired
   b. famous
   c. rich
   d. unhappy

4. DRAWER: The **drawer** was empty.
   a. sliding box
   b. place where cars are kept
   c. cupboard to keep things cold
   d. animal house

5. PATIENCE: He has no **patience**.
   a. will not wait happily
   b. has no free time
   c. has no faith
   d. does not know what is fair

6. NIL: His mark for that question was **nil**.
   a. very bad
   b. nothing
   c. very good
   d. in the middle

7. PUB: They went to the **pub**.
   a. place where people drink and talk
   b. place that looks after money
   c. large building with many shops
   d. building for swimming

8. CIRCLE: Make a **circle**.
   a. rough picture
   b. space with nothing in it
   c. round shape
   d. large hole

9. MICROPONE: Please use the **microphone**.
   a. machine for making food hot
   b. machine that makes sounds louder
   c. machine that makes things look bigger
   d. small telephone that can be carried around

10. PRO: He's a **pro**.
    a. someone who is employed to find out important secrets
    b. a stupid person
    c. someone who writes for a newspaper
    d. someone who is paid for playing sport etc

Third 1000

1. SOLDIER: He is a **soldier**.
   a. person in a business
   b. student
   c. person who uses metal
   d. person in the army

2. RESTORE: It has been **restored**.
   a. said again
   b. given to a different person
   c. given a lower price
   d. made like new again

3. JUG: He was holding a **jug**.
   a. A container for pouring liquids
   b. an informal discussion
   c. A soft cap
   d. A weapon that explodes

4. SCRUB: He is **scrubbing** it.
   a. cutting shallow lines into it
   b. repairing it
   c. rubbing it hard to clean it
   d. drawing simple pictures of it

5. DINOSAUR: The children were pretending to be **dinosaurs**.
   a. robbers who work at sea
   b. very small creatures with human form but with wings
   c. large creatures with wings that breathe fire
   d. animals that lived a long time ago

6. STRAP: He broke the **strap**.
   a. promise
   b. top cover
   c. shallow dish for food
   d. strip of material for holding things together

7. PAVE: It was **paved**.
   a. prevented from going through
   b. divided
   c. given gold edges
   d. covered with a hard surface

8. DASH: They **dashed** over it.
   a. moved quickly
   b. moved slowly
   c. fought
   d. looked quickly

9. ROVE: He couldn't stop **roving**.
   a. getting drunk
   b. travelling around
   c. making a musical sound through closed lips
   d. working hard

10. LONESOME: He felt **lonesome**.
    a. ungrateful
    b. very tired
    c. lonely
    d. full of energy

Fourth 1000

1. COMPOUND: They made a new **compound**.
   a. agreement
   b. thing made of two or more parts
   c. group of people forming a business
   d. guess based on past experience

2. LATTER: I agree with the **latter**.
   a. man from the church
   b. reason given
   c. last one
   d. answer

3. CANDID: Please be **candid**.
   a. be careful
   b. show sympathy
   c. show fairness to both sides
   d. say what you really think

4. TUMMY: Look at my **tummy**.
   a. cloth to cover the head
   b. stomach
   c. small furry animal
   d. thumb

5. QUIZ: We made a **quiz**.
   a. thing to hold arrows
   b. serious mistake
   c. set of questions
   d. box for birds to make nests in

6. INPUT: We need more **input**.
   a. information, power, etc. put into something
   b. workers
   c. artificial filling for a hole in wood
   d. money

7. CRAB: Do you like **crabs**?
   a. sea creatures that walk sideways
   b. very thin small cakes
   c. tight, hard collars
   d. large black insects that sing at night

8. VOCABULARY: You will need more **vocabulary**.
   a. words
   b. skill
   c. money
   d. guns

9. REMEDY: We found a good **remedy**.
   a. way to fix a problem
   b. place to eat in public
   c. way to prepare food
   d. rule about numbers

10. ALLEGE: They **alleged** it.
    a. claimed it without proof
    b. stole the ideas for it from someone else
    c. provided facts to prove it
    d. argued against the facts that supported it

Fifth 1000

1. DEFICIT: The company had a large **deficit**.
   a. spent a lot more money than it earned
   b. went down a lot in value
   c. had a plan for its spending that used a lot of money
   d. had a lot of money in the bank

2. WEEP: He **wept**.
   a. finished his course
   b. cried
   c. died
   d. worried

3. NUN: We saw a **nun**.
   a. long thin creature that lives in the earth
   b. terrible accident
   c. woman following a strict religious life
   d. unexplained bright light in the sky

4. HAUNT: The house is **haunted**.
   a. full of ornaments
   b. rented
   c. empty
   d. full of ghosts

5. COMPOST: We need some **compost**.
   a. strong support
   b. help to feel better
   c. hard stuff made of stones and sand stuck together
   d. rotted plant material

6. CUBE: I need one more **cube**.
   a. sharp thing used for joining things
   b. solid square block
   c. tall cup with no saucer
   d. piece of stiff paper folded in half

7. MINIATURE: It is a **miniature**.
   a. a very small thing of its kind
   b. an instrument to look at small objects
   c. a very small living creature
   d. a small line to join letters in handwriting

8. PEEL: Shall I **peel** it?
   a. let it sit in water for a long time
   b. take the skin off it
   c. make it white
   d. cut it into thin pieces

9. FRACTURE: They found a **fracture**.
   a. break
   b. small piece
   c. short coat
   d. rare jewel

10. BACTERUM: They didn't find a single **bacterium**.
    a. small living thing causing disease
    b. plant with red or orange flowers
    c. animal that carries water on its back
    d. thing that has been stolen and sold to a shop

Sixth 1000

1. DEVIOUS: Your plans are **devious**.
   a. tricky
   b. well-developed
   c. not well thought out
   d. more expensive than necessary

2. PREMIER: The **premier** spoke for an hour.
   a. person who works in a law court
   b. university teacher
   c. adventurer
   d. head of the government

3. BUTLER: They have a **butler**.
   a. man servant
   b. machine for cutting up trees
   c. private teacher
   d. cool dark room under the house

4. ACCESSORY: They gave us some **accessories**.
   a. papers allowing us to enter a country
   b. official orders
   c. ideas to choose between
   d. extra pieces

5. THRESHOLD: They raised the **threshold**.
   a. flag
   b. point or line where something changes
   c. roof inside a building
   d. cost of borrowing money

6. THESIS: She has completed her **thesis**.
   a. long written report of study carried out for a university degree
   b. talk given by a judge at the end of a trial
   c. first year of employment after becoming a teacher
   d. extended course of hospital treatment

7. STRANGLE: He **strangled** her.
   a. killed her by pressing her throat
   b. gave her all the things she wanted
   c. took her away by force
   d. admired her greatly

8. CAVALIER: He treated her in a **cavalier** manner.
   a. without care
   b. politely
   c. awkwardly
   d. as a brother would

9. MALIGN: His **malign** influence is still felt.
   a. evil
   b. good
   c. very important
   d. secret

10. VEER: The car **veered**.
    a. went suddenly in another direction
    b. moved shakily
    c. made a very loud noise
    d. slid sideways without the wheels turning

Seventh 1000

1. OLIVE: We bought **olives**.
   a. oily fruit
   b. scented pink or red flowers
   c. men's clothes for swimming
   d. tools for digging up weeds

2. QUILT: They made a **quilt**.
   a. statement about who should get their property when they die
   b. firm agreement
   c. thick warm cover for a bed
   d. feather pen

3. STEALTH: They did it by **stealth**.
   a. spending a large amount of money
   b. hurting someone so much that they agreed to their demands
   c. moving secretly with extreme care and quietness
   d. taking no notice of problems they met

4. SHUDDER: The boy **shuddered**.
   a. spoke with a low voice
   b. almost fell
   c. shook
   d. called out loudly

5. BRISTLE: The **bristles** are too hard.
   a. questions
   b. short stiff hairs
   c. folding beds
   d. bottoms of the shoes

6. BLOC: They have joined this **bloc**.
   a. musical group
   b. band of thieves
   c. small group of soldiers who are sent ahead of others
   d. group of countries sharing a purpose

7. DEMOGRAPHY: This book is about **demography**.
   a. the study of patterns of land use
   b. the study of the use of pictures to show facts about numbers
   c. the study of the movement of water
   d. the study of population

8. GIMMICK: That's a good **gimmick**.
   a. thing for standing on to work high above the ground
   b. small thing with pockets to hold money
   c. attention-getting action or thing
   d. clever plan or trick

9. AZALEA: This **azalea** is very pretty.
   a. small tree with many flowers growing in groups
   b. light material made from natural threads
   c. long piece of material worn by women in India
   d. sea shell shaped like a fan

10. YOGHURT: This **yoghurt** is disgusting.
    a. grey mud found at the bottom of rivers
    b. unhealthy, open sore
    c. thick, soured milk, often with sugar and flavouring
    d. large purple fruit with soft flesh

Eighth 1000

1. ERRATIC: He was **erratic**.
   a. without fault
   b. very bad
   c. very polite
   d. unsteady

2. PALETTE: He lost his **palette**.
   a. basket for carrying fish
   b. wish to eat food
   c. young female companion
   d. artist's board for mixing paints

3. NULL: His influence was **null**.
   a. had good results
   b. was unhelpful
   c. had no effect
   d. was long-lasting

4. KINDERGARTEN: This is a good **kindergarten**.
   a. activity that allows you to forget your worries
   b. place of learning for children too young for school
   c. strong, deep bag carried on the back
   d. place where you may borrow books

5. ECLIPSE: There was an **eclipse**.
   a. a strong wind
   b. a loud noise of something hitting the water
   c. The killing of a large number of people
   d. The sun hidden by a planet

6. MARROW: This is the **marrow**.
   a. symbol that brings good luck to a team
   b. Soft centre of a bone
   c. control for guiding a plane
   d. increase in salary

7. LOCUST: There were hundreds of **locusts**.
   a. insects with wings
   b. unpaid helpers
   c. people who do not eat meat
   d. brightly coloured wild flowers

8. AUTHENTIC: It is **authentic**.
   a. real
   b. very noisy
   c. Old
   d. Like a desert

9. CABARET: We saw the **cabaret**.
   a. painting covering a whole wall
   b. song and dance performance
   c. small crawling insect
   d. person who is half fish, half woman

10. MUMBLE: He started to **mumble**.
    a. think deeply
    b. shake uncontrollably
    c. stay further behind the others
    d. speak in an unclear way

Ninth 1000

1. HALLMARK: Does it have a **hallmark**?
   a. stamp to show when to use it by
   b. stamp to show the quality
   c. mark to show it is approved by the royal family
   d. Mark or stain to prevent copying

2. PURITAN: He is a **puritan**.
   a. person who likes attention
   b. person with strict morals
   c. person with a moving home
   d. person who hates spending money

3. MONOLOGUE: Now he has a **monologue**.
   a. single piece of glass to hold over his eye to help him to see better
   b. long turn at talking without being interrupted
   c. position with all the power
   d. picture made by joining letters together in interesting ways

4. WEIR: We looked at the **weir**.
   a. person who behaves strangely
   b. wet, muddy place with water plants
   c. old metal musical instrument played by blowing
   d. thing built across a river to control the water

5. WHIM: He had lots of **whims**.
   a. old gold coins
   b. female horses
   c. strange ideas with no motive
   d. sore red lumps

6. PERTURB: I was **perturbed**.
   a. made to agree
   b. Worried
   c. very puzzled
   d. very wet

7. REGENT: They chose a **regent**.
   a. an irresponsible person
   b. a person to run a meeting for a time
   c. a ruler acting in place of the king
   d. a person to represent them

8. OCTOPUS: They saw an **octopus**.
   a. a large bird that hunts at night
   b. a ship that can go under water
   c. a machine that flies by means of turning blades
   d. a sea creature with eight legs

9. FEN: The story is set in the **fens**.
   a. low land partly covered by water
   b. a piece of high land with few trees
   c. a block of poor-quality houses in a city
   d. a time long ago

10. LINTEL: He painted the **lintel**.
    a. Beam over the top of a door or window
    b. small boat used for getting to land from a big boat
    c. beautiful tree with spreading branches and green fruit
    d. board showing the scene in a theatre

Tenth 1000

1. AWE: They looked at the mountain with **awe**.
   a. worry
   b. interest
   c. wonder
   d. respect

2. PEASANTRY: He did a lot for the **peasantry**.
   a. local people
   b. place of worship
   c. businessmen's club
   d. poor farmers

3. EGALITARIAN: This organization is **egalitarian**.
   a. does not provide much information about itself to the public
   b. dislikes change
   c. frequently asks a court of law for a judgement
   d. treats everyone who works for it as if they are equal

4. MYSTIQUE: He has lost his **mystique**.
   a. his healthy body
   b. the secret way he makes other people think he has special power or skill
   c. the woman who has been his lover while he is married to someone else
   d. the hair on his top lip

5. UPBEAT: I'm feeling really **upbeat** about it.
   a. upset
   b. good
   c. hurt
   d. confused

6. CRANNY: We found it in the **cranny**!
   a. sale of unwanted objects
   b. narrow opening
   c. space for storing things under the roof of a house
   d. large wooden box

7. PIGTAIL: Does she have a **pigtail**?
   a. a rope of hair made by twisting bits together
   b. a lot of cloth hanging behind a dress
   c. a plant with pale pink flowers that hang down in short bunches
   d. a lover

8. CROWBAR: He used a **crowbar**.
   a. heavy iron pole with a curved end
   b. false name
   c. sharp tool for making holes in leather
   d. light metal walking stick

9. RUCK: He got hurt in the **ruck**.
   a. hollow between the stomach and the top of the leg
   b. pushing and shoving
   c. group of players gathered round the ball in some ball games
   d. race across a field of snow

10. LECTERN: He stood at the **lectern**.
    a. desk to hold a book at a height for reading
    b. table or block used for church sacrifices
    c. place where you buy drinks
    d. very edge

Eleventh 1000

1. EXCRETE: This was **excreted** recently.
   a. pushed or sent out
   b. made clear
   c. discovered by a science experiment
   d. put on a list of illegal things

2. MUSSEL: They bought **mussels**.
   a. small glass balls for playing a game
   b. shellfish
   c. large purple fruits
   d. pieces of soft paper to keep the clothes clean when eating

3. YOGA: She has started **yoga**.
   a. handwork done by knotting thread
   b. a form of exercise for body and mind
   c. a game where a cork stuck with feathers is hit between two players
   d. a type of dance from eastern countries

4. COUNTERCLAIM: They made a **counterclaim**.
   a. a demand made by one side in a law case to match the other side's demand
   b. a request for a shop to take back things with faults
   c. An agreement between two companies to exchange work
   d. a top cover for a bed

5. PUMA: They saw a **puma**.
   a. small house made of mud bricks
   b. tree from hot, dry countries
   c. very strong wind that sucks up anything in its path
   d. large wild cat

6. PALLOR: His **pallor** caused them concern.
   a. his unusually high temperature
   b. his lack of interest in anything
   c. his group of friends
   d. the paleness of his skin

7. APERITIF: She had an **aperitif**.
   a. a long chair for lying on with just one place to rest an arm
   b. a private singing teacher
   c. a large hat with tall feathers
   d. a drink taken before a meal

8. HUTCH: Please clean the **hutch**.
   a. thing with metal bars to keep dirt out of water pipes
   b. space in the back of a car for bags
   c. metal piece in the middle of a bicycle wheel
   d. cage for small animals

9. EMIR: We saw the **emir**.
   a. bird with long curved tail feathers
   b. woman who cares for other people's children in Eastern countries
   c. Middle Eastern chief with power in his land
   d. house made from blocks of ice

10. HESSIAN: She bought some **hessian**.
    a. oily pinkish fish
    b. stuff producing a happy state of mind
    c. coarse cloth
    d. strong-tasting root for flavouring food

Twelfth 1000

1. HAZE: We looked through the **haze**.
   a. small round window in a ship
   b. unclear air
   c. strips of wood or plastic to cover a window
   d. list of names

2. SPLEEN: His **spleen** was damaged.
   a. knee bone
   b. organ found near the stomach
   c. pipe taking waste water from a house
   d. respect for himself

3. SOLILOQUY: That was an excellent **soliloquy**!
   a. song for six people
   b. short clever saying with a deep meaning
   c. entertainment using lights and music
   d. speech in the theatre by a character who is alone

4. REPTILE: She looked at the **reptile**.
   a. old hand-written book
   b. animal with cold blood and a hard outside
   c. person who sells things by knocking on doors
   d. picture made by sticking many small pieces of different colours together

5. ALUM: This contains **alum**.
   a. a poisonous substance from a common plant
   b. a soft material made of artificial threads
   c. a tobacco powder once put in the nose
   d. a chemical compound usually involving aluminium

6. REFECTORY: We met in the **refectory**.
   a. room for eating
   b. office where legal papers can be signed
   c. room for several people to sleep in
   d. room with glass walls for growing plants

7. CAFEINE: This contains a lot of **caffeine**.
   a. a substance that makes you sleepy
   b. threads from very tough leaves
   c. ideas that are not correct
   d. a substance that makes you excited

8. IMPALE: He nearly got **impaled**.
   a. charged with a serious offence
   b. put in prison
   c. stuck through with a sharp instrument
   d. involved in a dispute

9. COVEN: She is the leader of a **coven**.
   a. a small singing group
   b. a business that is owned by the workers
   c. a secret society
   d. a group of church women who follow a strict religious life

10. TRILL: He practised the **trill**.
    a. ornament in a piece of music
    b. type of stringed instrument
    c. Way of throwing a ball
    d. dance step of turning round very fast on the toes

Thirteenth 1000

1. UBIQUITOUS: Many weeds are **ubiquitous**.
   a. are difficult to get rid of
   b. have long, strong roots
   c. are found in most countries
   d. die away in the winter

2. TALON: Just look at those **talons**!
   a. high points of mountains
   b. sharp hooks on the feet of a hunting bird
   c. heavy metal coats to protect against weapons
   d. people who make fools of themselves without realizing it

3. ROUBLE: He had a lot of **roubles**.
   a. very precious red stones
   b. distant members of his family
   c. Russian money
   d. moral or other difficulties in the mind

4. JOVIAL: He was very **jovial**.
   a. low on the social scale
   b. likely to criticize others
   c. full of fun
   d. friendly

5. COMMUNIQUE: I saw their **communiqué** .
   a. critical report about an organization
   b. garden owned by many members of a community
   c. printed material used for advertising
   d. official announcement

6. PLANKTON: We saw a lot of **plankton**.
   a. poisonous weeds that spread very quickly
   b. very small plants or animals found in water
   c. trees producing hard wood
   d. grey clay that often causes land to slip

7. SKYLARK: We watched a **skylark**.
   a. show with aeroplanes flying in patterns
   b. man-made object going round the earth
   c. person who does funny tricks
   d. small bird that flies high as it sings

8. BEAGLE: He owns two **beagles**.
   a. fast cars with roofs that fold down
   b. large guns that can shoot many people quickly
   c. small dogs with long ears
   d. houses built at holiday places

9. ATOLL: The **atoll** was beautiful.
   a. low island made of coral round a sea-water lake
   b. work of art created by weaving pictures from fine thread
   c. small crown with many precious jewels worn in the evening by women
   d. place where a river flows through a narrow place full of large rocks

10. DIDACTIC: The story is very **didactic**.
    a. tries hard to teach something
    b. is very difficult to believe
    c. deals with exciting actions
    d. is written in a way which makes the reader unsure of the meaning

Fourteenth 1000

1. CANONICAL: These are **canonical** examples.
   a. examples which break the usual rules
   b. examples taken from a religious book
   c. regular and widely accepted examples
   d. examples discovered very recently

2. ATOP: He was **atop** the hill.
   a. at the bottom of
   b. at the top of
   c. on this side of
   d. on the far side of

3. MARSUPIAL: It is a **marsupial**.
   a. an animal with hard feet
   b. a plant that grows for several years
   c. a plant with flowers that turn to face the sun
   d. an animal with a pocket for babies

4. AUGUR: It **augured** well.
   a. promised good things for the future
   b. agreed well with what was expected
   c. had a colour that looked good with something else
   d. rang with a clear, beautiful sound

5. BAWDY: It was very **bawdy**.
   a. unpredictable
   b. enjoyable
   c. rushed
   d. rude

6. GAUCHE: He was **gauche**.
   a. talkative
   b. flexible
   c. awkward
   d. determined

7. THESAURUS: She used a **thesaurus**.
   a. a kind of dictionary
   b. a chemical compound
   c. a special way of speaking
   d. an injection just under the skin

8. ERYTHROCYTE: It is an **erythrocyte**.
   a. a medicine to reduce pain
   b. a red part of the blood
   c. a reddish white metal
   d. a member of the whale family

9. CORDILLERA: They were stopped by the **cordillera**.
   a. a special law
   b. an armed ship
   c. a line of mountains
   d. the eldest son of the king

10. LIMPID: He looked into her **limpid** eyes.
    a. clear
    b. tearful
    c. deep brown
    d. beautiful

APPENDIX-C: Consent Form

Bu çalışmanın amacı 21 yüzyılın teknolojik gelişmelerinin dil eğitimindeki yansımalarını dikkate alarak tasarlanan kelime öğretim yöntemlerinin kullanılması ve bu yöntemlerin öğrencilerin algısal ve üretimsel kelime kullanımlarına olan etkilerinin incelenmesidir. Bu kapsamda Hacettepe Üniversitesi İngiliz Dili Eğitimi Bilim Dalındaki veri yönlendirmeli tekniklerle eş dizimliliklerin öğretilmesi hedeflenmektedir. Araştırmanın özel amacı veri yönlendirmeli bilgi edinme tekniğinin öğrencilere öğretilip, öğrencilerin kendi kedilerine yetebilme oranlarını artırmak ve bu ortamlarının öğrenciye olan katkılarını ortaya çıkarmak ve sonuçların genele yayılımını sağlamaktır. Elde edilen veriler sadece bilimsel amaçlar için kullanılacaktır. Çalışma sırasında herhangi bir sebepten rahatsızlık duyarsanız, size her türlü yardım ve destek sağlanacaktır. Çalışma size bir sorumluluk getirmeyecek nitelikte olup herhangi bir risk unsuru taşımamaktadır. Çalışma gönüllülük esasına bağlıdır, kişilerin katılıp katılmamayı seçme hakları vardır. Çalışmada mülakat da yapılacaktır ve çalışma Hacettepe Üniversitesi Etik Komisyonundan izin alınmıştır.

Çalışmaya ilişkin sorularınız varsa, lütfen araştırmacılarla iletişime geçmekten çekinmeyin. Bu çalışmaya katkınız için şimdiden teşekkür ederiz. Çalışma hakkında daha fazla bilgi için, araştırmacıların iletişim bilgileri aşağıda verilmiştir:

Araştırmacı **Danışman**

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Bu çalışmaya tamamen kendi isteğimle katılıyorum / bilimsel amaçlar için verdiğim bilgilerin kullanılmasına izin veriyorum. (Lütfen doldurduktan ve imzaladıktan sonra lütfen bu formu veri toplayıcıya gönderin).

Tarih:

Katılımcının adı & soyadı:

E-mail:

Telefon:

İmza:

APPENDIX-D: Demographic Information and Look Up Preferences Questionnaire

Demographic Information and Look Up Preferences Questionnaire

Name Surname : **Age:**

Gender : Male ☐ **Female** ☐

Years of Studying English :

0-3 ☐ **4-7** ☐ **8-11** ☐ **12-15** ☐ **More than 16** ☐

The following questions are regarding your experiences with using computers and your look up behaviours for unknown collocations.

What kind of dictionary do you often use to find the meaning of collocations ? Please check all that apply

☐ Bilingual

☐ Monolingual

☐ Paper Dictionary

☐ Monolingual Online Dictionary

☐ Bilingual Online Dictionary

Which online dictionary do you use?					
Online Dictionary	Never	Rarely	Sometimes	Usually	Always
TURENG					
Cambridge Collocation Dictionary Online					
Merriam-Webster Online					
Longman Dictionary of Contemporary English (LDOCE)					
Oxford Collocation Dictionary Online					
Ozdic					
Other (please write)					

APPENDIX- E : Task for Corpus Group

Name Surname :

Please visit the web page https://www.english-corpora.org/coca/ and try to guess the meanings of the collocations from the corpus.

Collocation	**Turkish Meaning**	**Sentence with the collocation**
Show solidarity		
Bid farewell		
Inflict pain		
Exert pressure		
Bear witness		
Natural Affinity		
Intrinsic motivation		
Meticulous attention		
Innate ability		
Vicious cycle		

APPENDIX F : Extract from Task for Parallel Texts Group

Please look at the collocations written in bold and try to find their meaning from the translated context provided in Turkish, then write a sentence with the collocation.

Collocation	English Context	Turkish Contex	Sentence with the Collocation
Hit Puberty	Sports gives them more, and I think it's a really good distraction, especially when girls **hit puberty.**	Özellikle kızlar ergenliğe girdiğinde, spor iyi bir dikkat dağıtıcı olduğunu ve onlara daha çok şey kazandırdığını düşünüyorum.	
	As I got older, **hit puberty**, my flaws started to surface and move into my face and body.	Yaşım arttıkça, ergenliğe de girdiğimden, vücudumdaki kusurlar yüzümde ve bedenimde gün yüzüne çıkmaya başladı.	
	Foster was a long-haired metalhead who seemed to be in constant trouble from the minute he **hit puberty**.	Foster, ergenliğe girdiği andan itibaren sürekli başı belada gibi görünen uzun saçlı bir metal kafalıydı.	
	Have you always had this voice, or like before you **hit puberty** did you have a very deep, resonant voice.	Her zaman bu sesiniz mi vardı, yoksa ergenliğe girmeden önce olduğu gibi çok derin, rezonant bir sesiniz mi vardı?	
	Garrett believes that for a while he did love the boy, but something ran afoul when Turpin **hit puberty**.	Garrett, bir süre, bu çocuğu sevdiğine inanıyordu, ancak Turpin ergenliğe girdiğinde bir şeyler ters gitti.	
Bear fruit	It is possible that the latest waves of innovation will take time to **bear fruit**	Son zamanlardaki yenilik dalgalarının meyve vermesi biraz zaman alacak gibi.	
	Our findings indicate that these efforts should **bear fruit**, inasmuch as potential candidates see their electoral prospects as improved.	Bulgularımız, bu çabaların meyvelerini vereceğini gösteriyor çünkü potansiyel adayların seçim umutları arttı.	
	Its efforts seemed to **bear fruit** when in March 2006 the United Nations Security Council issued resolution 1664 to form a Special Tribunal for Lebanon (STL) to investigate the assassination.	2006 yılının Mart ayında Birleşmiş Milletler Güvenlik Konseyi suikastı soruşturmak için Lübnan Özel Mahkemesi (STL) oluşturması için 1664 sayılı kararını verme çabaları meyve vermeye başladı gibi görünüyor.	
	This strategy may **bear fruit** for Romney, but what may seem like a brilliant strategy if he wins on Tuesday is really just a matter of due diligence.	Bu strateji Romney'in işine yarayabilir ancak Salı günü kazanırsa parlak bir strateji gibi görünen şeyin, gerçekte, onun gösterdiği özendir.	

APPENDIX-G: Task for the Control Group

Please find the meaning of the collocations from the dictionaries and fill in the blanks with the correct collocation. Write a sentence with the collocation.

Hit puberty	**Bear fruit**	**Lend credence**	**Yield results**	**Become ubiquitous**
Illicit drug	**Piecemeal approach**	**Noxious fumes**	**Voracious appetite**	**Subversive activities**

1. When Ethan ……. …….., he began to expand. He attained his full height-five feet nine inches-early and entered high school at 230 pounds.

2. _____
   As moderate nationalists, these liberal democrats assert that the pro-Western policy has failed to ……. …….., particularly in terms of promised Western aid.

3. _____
   The increase has been so dramatic that recent national surveys of substance use indicate that the prevalence of nonmedical prescription drug use is now greater than the prevalence of …….. ……. use, other than marijuana.

4. _____
   The International Court of Justice ruled on a dispute between the United States and Canada concerning property damage in the State of Washington caused by sulfuric and other ……. …….. originating from a smelter in British Columbia.

5. _____
   The government's concern with …….. …… from this group ran so high that even the 140 Italian Americans living in Alaska were not spared the scrutiny of the FBI.

6. _____
   Over the years, digital design software has matured, scanners have …….. …….. and affordable desktop printers have come within reach of self-starting entrepreneurs, schools and home tinkerers.

7. _____
   Sidebar space blimps balloons and airships can already reach the edge of space, but if some imaginative NASA projects …….. ……. , they might go even farther: to the atmospheres of other planets.

8. _____
   These companies, several of them acquired by African Americans during the past decade, …….. …….. to the idea that difficult economic times are a sure sign of new business opportunities.

9. _____
   To supply the region's …….. …….. for raw materials and help satisfy the world's appetite for the heartland's agricultural products, steamboats have hauled millions of tons annually across the lakes to and from places like Duluth, Minnesota, and Buffalo.

10. _____
    To teach a lay-up shot in a basketball through a ……. ……., teachers first begin by presenting how to use the fingertips of one hand to hold the ball, how to raise one hand to the high point, and how to spin the ball by pressing one wrist.
    _____

APPENDIX-H : Receptive Knowledge of Form Test (Set 1)

Choose the best option with the correct spelling.

1	a.solidarity	b.soledarity	c.solidarety
2	a.pain	b.pein	c.pian
3	a.show	b.shuw	c.shew
4	a.exirt	b. exert	c.exart
5	a.presure	b.pressure	c.pressur
6	a.enflict	b. anflict	c.inflict
7	a.motivetion	b. motivation	c.motvation
8	a.intrensic	b.intrinsic	c.intrnsic
9	a.afinity	b.affinity	c.affenity
10	a.farewll	b.farewell	c.firewell
11	a.natural	b.netural	c.natiral
12	a.baer	b.bear	c.bare
13	a.atention	b.attantion	c.attention
14	a.bid	b.bed	c.biid
15	a.meticulous	b.maticulous	c.meticalous
16	a.abilti	b.ability	c.ablity
17	a.cycle	b.cicyle	c.cycli
18	a.inate	b.innete	c.innate
19	a.witnes	b.witness	c.witnees
20	a.vicius	b.vicous	c.vecious

APPENDIX-I : Receptive Knowledge of Form Test (Set 2)

1	a.ilicit	b.illicit	c.illicite
2	a.puberty	b.pubertiy	c.pubertty
3	a.supversive	b.subversive	c.sabversive
4	a.apetite	b. eppatite	c.appetite
5	a.fruit	b.friut	c.firiut
6	a.yeild	b. yiled	c.yield
7	a.credence	b. credence	c.crudence
8	a.lend	b. land	c. leand
9	a. varocious	b. voracioes	c. voracious
10	a.approach	b.aproach	c.approache
11	a.naxious	b.noxieus	c.noxious
12	a. ubiquitous	b.ubiqutous	c.ubiquitus
13	a.piecimeal	b.piecemael	c.piecemeal
14	a.results	b.ressults	c.reselts
15	a.activities	b.acivties	c.acvitiis
16	a.drag	b.dreg	c.drug
17	a.become	b.becam	c.bicome
18	a.bear	b. baer	c.beare
19	a.hit	b.hitt	c.hite
20	a.fumes	b.femes	c.fames

APPENDIX-K: Receptive Knowledge of Use Test (Set 1 / Set 2)

Match each of the word on the left with the word on the right that it often occurs with.

1. exert	a. pressure
2. innate	b. attention
3. inflict	c. cycle
4. show	d. witness
5. natural	e. farewell
6. meticulous	f. motivation
7. bid	g. ability
8. vicious	h. pain
9. intrinsic	i. affinity
10. bear	l. solidarity

1:
2:
3:
4:
5:
6:
7:
8:
9:
10:

1. Hit	a. fruit
2. lend	b. ubiquitous
3. yield	c. approach
4. voracious	d. puberty
5. noxious	e. drug
6. bear	f. credence
7. piecemeal	g. appetite
8. illicit	h. fumes
9. become	i. results
10. subversive	l. activities

1:
2:
3:
4:
5:
6:
7:
8:
9:
10:

APPENDIX-L: Receptive Knowledge of Meaning Test (Set 1)

Read the sentences and choose the best alternative

1.The trends were strongest among those with the least education and in the predominantly red South and West, with the authors suggesting a _____ _____ of physical pain and addiction to painkillers, compounded by fiscal uncertainty.

a.inflict pain b. exert pressure c. vicious cycle

2. This apparent obliviousness to their own species suggests that fledgling galah chicks have no _____ _____ to recognize their own species as such.

a. meticulous attention b. innate ability c. intrinsic motivation

3. Elite groups could _____ _____ on policymakers because of their important positions in society.

a. inflict pain b. bear witness c. exert pressure

4. The threat to _____ _____ can trigger fears more damaging than the immediate sensation of pain.

a. Show solidarity b. inflict pain c. bear witness

5. Turkish prime minister cut short a trip to northern Cypress in order to show a presence, to show Turkish concern, to _____ _____ with the Turkish Jewish community.

a. Show solidarity b. bid farewell c. exert pressure

6. Castro oozes a _____ _____ for the music and suffuses the album with his charm and relaxed sensibilities.

a. meticulous attention b. natural affinity c. vicious cycle

7. I have dedicated myself to exposing the vile system of penal colonies that still stretches from one end of China to the other, to _____ _____ to the nightmare that I and millions of other innocent Chinese have been forced to endure.

a. bear witness b. bid farewell c. exert pressure

8. With the _____ _____ to detail of a chief copy editor, he went through corrections on the galleys for the screenplay of " Richard III, " which is to be published in book form.

a. natural affinity b. innate ability c. meticulous attention

9. The songs of arrival and the songs that_____ _____, the songs of summoning and the drinking songs, all accompany or usher in various set phases of the ritual, but sotaque express the participants' discontent with the proceeding of the ritual and the behavior of others.

a. intrinsic motivation b. bid farewell c. meticulous attention

10. In fact, in terms of becoming a life-long reader, the extrinsic motivation tends to neutralize _____ _____ and inhibits the long-term motivation to read for the value of reading.

a. intrinsic motivation b. natural affinity c. meticulous attention

APPENDIX-M : Receptive Knowledge of Meaning Test (Set 2)

1. I think we're seeing it in both, but I think it starts in the younger age groups, especially as young boys …… ……. and they want to have more muscle. Young boys have always wanted to have muscle at that time, but we're starting to see this image of body dissatisfaction with men. The term "Adonis Complex" is not a medical one.

a. yiled results b. become ubiquitous c. hit puberty

2. Yang and Mills failed to find a satisfactory theory of the strong interactions, but the Yang-Mills idea of non-abelian gauge theory did …… ……. in the late 1960s, in a unified field theory of the electromagnetic and weak interactions.

a. bear fruit b. lend credence c. yield results

3. Research on the use of multivitamins and the incidence of a variety of birth defects would …….. …… to the hypothesis that all pregnant women should be supplemented with vitamins and minerals.

a. hit puberty b. become ubiquitous c. lend credence

4. Bohm's interpretation of quantum mechanics was criticized because it did not …… …….. that differ from orthodox quantum theory, which makes it difficult to test against conventional interpretations.

a. lend credence b. bear fruit c. yield results

5. Only toxic effects, often found after a product has ……. …… in the environment and in people's bodies, must be reported-and even that rule, as DuPont discovered, can be broken with only a minor hit to profits.

a. become ubiquitous b. voracious appetite c. Noxious fumes

6. Kipke and colleagues reported that 71% of their sample of homeless youth met criteria for alcohol and/or …….. …….. use disorder.

a. subversive activity b. illicit drug c. voracious appetite

7. It has been argued that the theoretical basis of the …….. ……. in school is rooted in empiricist epistemology (DeRuiter, 1991). Empiricist epistemology holds that human beings acquire knowledge of the world beginning with simple concepts and skills and gradually building to more complex knowledge.

a. lend credence b. subversive activity c. piecemeal approach

8. …… ……. had buried the long chain of Aleutian Islands where he lived. Only the highest volcanic peaks emerged above the haze, and from space, the ancient land bridge resembled the broken spine of some great fallen bird

a. Voracious appetite b. Noxious fumes c. Illicit drug

9. To feed the film industry's …… …… for attractive faces, it lures especially beautiful women from around the world.

a. bear fruit b. lend credence c. Voracious appetite

10**.** Although some groups ideologically related to Tirana were engaged in ……. …… in Kosovo, they proved nothing but an embarrassment for the Albanian authorities.

a. illicit drug b. yiled results c. subversive activity

APPENDIX-N : Controlled Productive Knowledge Test Set 1

A collocation has been deleted in each of the sentences below, please supply it. Two letters have been provided to give you a hint.

Example :

Dr. Thornton does not **in…….. ……..** because he does not follow through or back up what he says.

Dr. Thornton does not **inspire confidence** because he does not follow through or back up what he says.

1. Writers use present tense time markers to create a feeling of urgency, to **sh……. ……..** with the reader, and to make the reader feel as if he or she is occupying the persona of the narrator.
2. Washington has recently asked both of those countries to help **ex**……. ……. on North Korea to stop what it is doing, stop moving towards nuclear weapons development.
3. The budget problem and looming economic trouble are likely to **in**…… …….. on everyone.
4. The soldier who had asked his country to **bi**.. ……to its solitude among nations, to go beyond the siege it has known since its birth, was struck down when his latest work, this search for peace, had begun to bear fruit.
5. These books **be**…… …… to the many people of integrity who struggle to partner with the divine in order to create Gardens of Eden.
6. The former president, whose **na**…….. ……. for the white working class won him the presidency in 1992 and reelection in 1996, repeatedly pushed his wife's campaign to do more outreach to economically distressed white communities by prioritizing her populist economic message, according to The New York Times.
7. During schoolwork, many youth experience high levels of both concentration and challenge but low levels of **in**…… ……. because schoolwork is a context in which mental effort is " under the control of incentives and structuring provided by adults.
8. The movie follows him with **me**…… ……. to detail while he establishes an alibi, kills a nightclub owner, survives a police lineup, is betrayed by those who hired him, and becomes the subject of a police manhunt that involves a cat-and-mouse chase through the Paris Metro.
9. Musicians who logged more hours did so because they had more **in**…… …… and therefore obtained better results from their practice sessions.
10. Not long after finding an apartment, Andy began a **vi**…….. ……. of shopping, drinking, check-bouncing and alienating anyone who might be considered friendly.

APPENDIX-O : Controlled Productive Knowledge Test Set 2

A collocation has been deleted in each of the sentences below, please supply it. Two letters have been provided to give you a hint.

Example :

Dr. Thornton does not **in…….. ……..** because he does not follow through or back up what he says.

Dr. Thornton does not **inspire confidence** because he does not follow through or back up what he says.

1. Comparing girls with the same body mass index in Denmark and the U.S., Danish girls **hi**…… …… a full year later than their American counterparts.
2. Less studied among **il**…….. …… users are the effects of pressure from family, friends, and peers.
3. A few nights later, Abu Daoud hoisted his eight heavily armed men over the fence surrounding the Olympic Village, then went back to his hotel and waited to hear whether his efforts would **be**…… ……..
4. Research on the basis of naturally occurring expectancies will likely **yi**…… …… more like those, that may be observed in reality in the schools.
5. Over the last decade, cellphones have **be**…… …… in the United States, " the Justice Department's petition says. " Inexpensive, disposable phones that are difficult to trace are particularly common in drug-trafficking conspiracies.
6. The position by the majority of this court can only **le**…… …….. to the most cynical appraisal of the work of judges throughout the land, " said Stevens in a scathing comment on yesterday's ruling.
7. Indeed, the tales of Blair's imbibing and snorting are so detailed and lurid that it seems as though one of his publisher's goals was to put out a story that feeds this nation's **vo**…….. …… for books about self-destructive African American men.
8. We want to come to terms that are compatible for the interests and concerns of both sides, but this is not a wild card, an open door for terrorist activities, for **su**…….. ……., for inducing violence.
9. While most education reform efforts take a **pi**…… ……., Levin says, accelerated schools are encouraged to revamp curriculum, organization, and instruction all at once.
10. Family members think her woes may stem from her former job on industrial presses, where she was exposed to **no**…….. ……., combined with long-term exposure to environmental hazards in Maywood

APPENDIX-P: Ethics Committee Approval

Tarih: 28/05/2019
Sayı: 35853172-101.02.02-E.00000601074

0000601074

T.C.
HACETTEPE ÜNİVERSİTESİ
Rektörlük

Sayı : 35853172-101.02.02
Konu : Sevcan BAYRAKTAR Hk.(Etik Komisyon)

EĞİTİM BİLİMLERİ ENSTİTÜSÜ MÜDÜRLÜĞÜNE

İlgi : 29.04.2019 tarihli ve 51944218-101.02.02/00000570717 sayılı yazınız.

Enstitünüz Yabancı Diller Eğitimi Anabilim Dalı İngiliz Dili Eğitimi Bilim Dalı Doktora programı öğrencilerinden **Sevcan BAYRAKTAR ÇEPNİ**'nin, **Doç. Dr. Nuray ALAGÖZLÜ** danışmanlığında yürüttüğü "**Eşdizimliliklerin Veri-Yönlendirme Öğrenimi Öğretimi: İki Yöntemin Karşılaştırması/Teaching Collocations Through Data Driven Learning: Comparison of Two Approaches**" başlıklı tez çalışması Üniversitemiz Senatosu Etik Komisyonunun **14 Mayıs 2019** tarihinde yapmış olduğu toplantıda incelenmiş olup, etik açıdan uygun bulunmuştur.

Bilgilerinizi ve gereğini saygılarımla rica ederim.

e-imzalıdır
Prof. Dr. Rahime Meral NOHUTCU
Rektör Yardımcısı

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Duygu Didem İLF[illegible]