



FAKULTETI I GJUHËVE, KULTURAVE DHE KOMUNIKIMIT ФАКУЛТЕТ ЗА ЈАЗИЦИ, КУЛТУРИ И КОМУНИКАЦИЈА FACULTY OF LANGUAGES, CULTURES AND COMMUNICATIONS

## POST-GRADUATE STUDIES – THIRD CYCLE

THESIS:

CORPORA AND VOCABULARY LEARNING – USING DATA-DRIVEN LEARNING (DDL) IN ACADEMIC SETTINGS TO BOOST VOCABULARY PROFICIENCY AND FOSTER LEARNER AUTONOMY

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## DECLARATION

I declare that the present thesis is all composed by me and it is considered as my own research. I also confirm that it has not been submitted for any other degree, at another university or any professional qualification.

Emin Idrizi

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#### ABSTRACT

University students who major in English are typically required to expand their vocabulary efficiently and in great amounts. Moreover, they are required to master vocabulary beyond mere recognition of words. That is to say, besides definitional knowledge of words (receptive vocabulary knowledge) they are also required to recall words and be able to use them in sentences (productive vocabulary knowledge). One solution to these vocabulary learning issues may lie in using word part strategy with the help of corpora. On one hand, word part strategy has proven to increase word learning efficiency and thus may be an answer to the problem of extensive vocabulary expansion. Word part strategy alone, however, may guarantee only a shallow knowledge of words, such as recognition. Corpora as learning tools and DDL as a technique, on the other hand, may fill this gap and could supplement and enhance the effectiveness of the word part strategy. Exposure to corpus data is believed to improve retention and can enhance learners' understanding of how words are used in context (Quan, 2016).

Having these issues in mind, this study was set out to investigate whether corpus consultation and DDL can contribute to better vocabulary retention as well as better receptive and productive vocabulary knowledge compared to a more traditional method. It examined learning word parts by two groups of university students from two private universities in Macedonia. One group was trained in corpus use and was taught word parts more inductively with the help of a corpus. The other group, by contrast, was applied a more traditional approach to teaching and learning word parts (i.e. deductive approach).

The results indicate that corpus consultation and DDL could enhance the effectiveness of the word part strategy. Participants who made use of corpus marked significantly better vocabulary gains compared to the ones who engaged in more conventional teaching and learning paradigm. Moreover, DDL showed to be effective when it comes to improving students' receptive and productive knowledge. The questionnaire and the qualitative data, on the other hand, show that students have positive attitudes towards the use of corpus in vocabulary learning.

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The study suggests that using corpora to teach and learn word parts not only results in successful word retention and receptive/productive vocabulary knowledge, but it is also a great learning experience for students. The research data also indicate that two issues should be taken into consideration when engaging learners in DDL: (1) some learners may have trouble interpreting corpus data and therefore may need more corpus training; (2) and the language level of the corpus text may be difficult for some students, especially those who have lower English language proficiency.

**Keywords:** concordancing lines, corpora, DDL, learner autonomy, receptive & productive vocabulary knowledge, vocabulary retention, word parts

#### ABSTRAKT

Studentët të cilët studiojnë gjuhën angleze nevojitet ta zgjerojnë leksikun shpejt dhe në mënyrë efikase gjatë studimeve. Gjithashtu, ata duhet të zotërojnë njohuri më të thella në lidhje me fjalët që i mësojnë. Kjo nënkupton se përveç njohjes së kuptimit të fjalëve ata duhet të zotërojnë edhe njohuri më aktive të tyre, si për shembull të jenë në gjendje t'i sjellin në mendje fjalët e reja dhe të mund t'i përdorin ato në fjali. Një zgjidhje sa i përket këtyre sfidave në nxënien e fjalëve të reja është përdorimi i strategjisë së nxënies së fjalëve përmes fjalëformimit me parashtesa dhe prapashtesa të kuptimshme me ndihmën e korpuseve elektronike. Nga njëra anë, strategjia e nxënies së fjalëve përmes fjalëformimit me parashtesa dhe prapashtesa ka dëshmuar të jetë e efektshme në nxënien e fjalëve të reja dhe mund të konsiderohet si zgjidhje në rastet kur zgjerimi i shpejtë dhe i efektshëm i leksikut është i nevojshëm. Megjithatë, kjo strategji si e vetme (pa ndihmën e korpusit) mund të sigurojë vetëm njohuri sipërfaqësore dhe të cekët të fjalëve të reja, siç është njohja e tyre (vetëm kur i hasim ato, p.sh. në tekst). Nga ana tjetër, përdorimi i korpuseve elektronike dhe teknikës së nxënies përmes të dhënave në korpus ka gjasa të mënjanojnë këtë dobësi si dhe ta plotësojnë dhe shtojnë efektshmërinë e strategjisë në fjalë. Ekspozimi ndaj të dhënave në korpus besohet të përmirësojë mbajtjen mend të fjalëve dhe mund ta ndihmojë nxënësin të kuptojë se si fjalët përdoren në kontekst (Quan, 2016).

Duke marrë parasyshë gjithë këto çështje, ky hulumtim ka filluar me qëllimin të hulumtojë nëse përdorimi i korpuseve elektronike dhe teknikës së nxënies përmes të dhënave në korpus kontribuojnë në memorizimin më të efektshëm të fjalëve të reja si dhe nxënien më të suksesshme të tyre nga aspekti pasiv (aftësisë së njohjes së fjalëve në lexim dhe dëgjim) dhe aktiv (aftësisë së prodhimit të fjalëve në të folurit dhe të shkruarit) në krahasim me përdorimin e metodës më tradicionale. Hulumtimi ka përfshirë dy grupe studentësh universitarë nga dy universitete private në Maqedoni të cilët i janë qasur mësimit të fjaleve me parashtesa dhe prapashtesa të caktuara. Njëri grup është trajnuar në përdorimin e korpusit elektronik dhe ka përdorur të njëjtin gjatë nxënies së fjalëve me parashtesa dhe prapashtesa me metodë më pa ndihmën e korpusit; mësimi me këtë grup është zhvilluar në mënyrë më tradicionale dhe përmes metodës deduktive të mësimdhënies dhe mësimnxënies.

Rezultatet e hulumtimit tregojnë që përdorimi i korpusit elektronik e shton efektshmërinë e strategjisë së nxënies së fjalëve përmes fjalëformimit me parashtesa dhe prapashtesa. Pjesëmarrësit që kanë përdorur korpusin kanë treguar zotërim më të suksesshmë të fjalëve të reja në krahasim me ata që kanë përdorur metodën tradicionale të nxënies. Teknika e nxënies përmes të dhënave në korpus gjithashtu tregon të jetë e efektshme kur kemi të bëjmë me përmirësimin e njohurive për fjalët, si nga aspekti aktiv ashtu edhe nga ai pasiv. Pyetësorët, nga ana tjetër, tregojnë që studentët kanë qëndrime pozitive ndaj përdorimit të korpusit elektronik në nxënien e fjalëve të reja.

Hulumtimi tregon se përdorimi i korpuseve elektronike në mësimdhënien dhe mësimnxënien e fjalëve jo vetëm që është i dobishëm në nxënien e fjalëve, por është edhe një përvojë e mirë për studentët. Të dhënat gjithashtu tregojnë që dy gjëra duhet marrë parasyshë kur vendosim të përdorim korpusin me studentë me qëllim nxënien e fjalëve te reja: (1) disa studentë mund të hasin në vështirësi gjatë interpretimit të të dhënave në korpus, dhe në këtë mënyrë trajnimi më i gjatë mund të jetë i domosdoshëm; (2) niveli i gjuhës në korpus mund të jetë i rëndë për ata studentë niveli (i njohjes së gjuhës angleze) i të cilëve është më i ulët.

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## **List of Abbreviations**

- BNC The British National Corpus
- CALL Computer-assisted Language Learning
- COCA The Corpus of Contemporary American English
- DDL Data-driven Learning
- EFL English as a Foreign Language
- ESL English as a Second Language
- IT Information Technology
- KWIC Keywords in Context
- QPT Quick Placement Test
- VKS Vocabulary Knowledge Scale

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### **1. INTRODUCTION**

Vocabulary is now seen as a crucial component of language. As Wilkins (1972) so rightly put it: "Without grammar very little can be conveyed, without vocabulary nothing can be conveyed" (p. 111). After a period of neglect, vocabulary has gained a tremendous momentum in language education and it is now considered as important as other language areas when it comes to language development or communication in a foreign language. Various textbooks have been published and vocabulary teaching techniques have been tested and used in order to help language learners become successful foreign language speakers.

Vocabulary learning is of special importance in academic settings. Students who enroll in universities outside US or UK in which English is the medium of instruction are typically required to learn and retain a vast amount of general and academic vocabulary so they could be able to succeed academically. Referring to several scholars, Schmitt (2000) reports that there is no common consensus on how many words a learner is required to know in order to comprehend target language texts and that the estimates range from 3000 to 10 000 word families. According to Sutarsyah et al. (as cited in Cobb, 1999), even 3500 words can be sufficient for autonomous reading in a certain subject. Nation (2006), on the other hand, estimates that in order for a learner to comprehend a text without assistance he needs to know approximately up to 9000 word families. No matter the exact corpus of words needed, what is essential in these settings is that students are required to learn new vocabulary extensively in order to complete their studies.

The challenge is even greater for students who choose to study in English Language Programs whose aims are to become either English teachers or translators once they graduate. The range of vocabulary knowledge that needs to be acquired by these particular students is even greater as they need to master a wide array of vocabulary by becoming proficient at both academic and general language as well as manage to master a range of words belonging to different genres and styles. In addition, these future language professionals do not need only a superficial

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knowledge of words, but rather they need to master words in more depth so they could be able to use them in speaking and writing, i.e. productively. This is especially challenging in countries in which English is taught as a foreign language and mainly through instructions. Back in 2015 the Macedonian Ministry of Education raised serious concerns regarding English teachers not reaching a sufficient English level upon graduation, that is, C1 Level according to CEFR standards. This indicates that reaching the right language proficiency, including vocabulary proficiency, in these particular educational settings is a real challenge and a concerning issue for which solutions should be sought.

It is thus clearly evident that EFL learners, especially university students, need effective strategies they can utilize to boost their corpus of lexical items efficiently and successfully. Various vocabulary techniques have been discussed and promoted in the literature that are believed to help learners in word expansion. One widespread technique, for instance, is exposing learners to target language texts through extensive reading (Coady, 1997). Other ways include: boosting vocabulary through word-lists (Folse, 2011), such as academic word lists (Coxhead, 2000); expanding vocabulary through listening activities (Cohen, 2008), to name just a few.

One useful technique for boosting English language learners' vocabulary, which is the focus of the current study, is the word part strategy (i.e. learning words with common affixation). This particular strategy may be said to correspond to the principle that "organizing vocabulary in meaningful ways makes it easier to learn" (Schmitt, 1997; Sökmen, 1997; as cited in McCarten, 2007). It can be used to enhance lexical knowledge by using certain prefixes and suffixes that are added to the already existing words. For instance, the prefix *hyper*- can be added to many existing adjectives to mean 'very' or 'too much of something' (expressed by the adjective); e.g. someone who is *hypercritical* tends to be extremely and unreasonably critical to others. Other words that can combine with this prefix are: *hyperactive, hypercreative, hypersensitive etc.* Thus, by learning the prefix *hyper-*, learners would be able to both comprehend or decode the

meaning of numerous words as well as produce a considerable number of other words with this type of word formation.

The strategy has been praised by many theorists (e.g. Cook, 2016, Nation, 2013) for its usefulness in language development. One important question that arises, however, is: how should word forms be taught to students? This question does not question the importance of word part strategy as a useful learning technique, but rather suggests that the use of one teaching and learning approach over another may play a role in the degree of effectiveness of the technique. That is to say, some approaches to teaching and learning word forms may be more effective (e.g. in terms of retention and productive use) than some other approaches.

The most common teaching paradigm that has been traditionally practiced in many educational settings for quite some time now is the well-known PPP (Present – Practice – Produce) approach which, in essence, is a deductive approach. With the new advancement in technology, however, new pedagogic perspectives have emerged. The emergence of computer corpora and Data-driven learning (DDL), a technique in which corpus data is used for pedagogic purposes, have paved the way for new opportunities not only in vocabulary learning but also in language learning in general. Corpora are now seen as valuable tools that language learners can use to investigate words, their various forms, contexts they typically occur, their frequency in language, and so on. As we will see later in the next chapter, DDL is originally an inductive approach and it adopts the three I's paradigm, i.e. Illustration - Interaction - Induction, to language teaching and learning (McEnery & Xiao, 2011).

Out of many other useful features, modern day corpora can provide valuable information and insights on word parts (Cheng, 2012). An online corpus interface named *IntelliText*, for example, can provide students with word part queries from which valuable data may be obtained on words that occur with particular prefixes or suffixes, such as frequency word lists, concordance lines for each word in the list etc. According to *IntelliText* tutorial (*IntelliText User Guide*, n.d.), having language learners use this corpus interface to investigate words with affixes or word

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parts is a brilliant technique to develop their vocabulary. However, this is only a claim that requires further investigation since, to our knowledge, no research has been conducted to confirm the effectiveness of learning word parts with the help of corpora. The current study aims to use *IntelliText* as a learning tool for students and it is set out to investigate whether using this online interface lead to effective vocabulary development.

#### 1.1 Corpus consultation and vocabulary retention

A key issue in vocabulary learning is that of retention. Insights drawn from psychology and Second Language Acquisition (SLA) refer to some processes a learner needs to go through in order to succeed in retaining a particular word. It is important to point out that these processes are believed to be consistent with DDL and how language is encountered and processed with the help of concordance lines.

The central idea behind retaining a lexical item is moving it from short-term memory into longterm memory in the brain so it could be available for later use. Although this process is not as simple as it sounds, yet literature is well developed on this subject and provides clear ideas and suggestions on how this process takes place. Drawing insights from psychology, Schmitt (2000) provides a decent explanation as to what is involved in successful retention of new lexical items:

The field of psychology (which actually has very close ties with the area of language learning and processing) has given us an important concept related to explicit language learning: the more one manipulates, thinks about, and uses mental information, the more likely it is that one will retain that information *(depth [levels] of processing hypothesis)*. In the case of vocabulary, the more one engages with a word (deeper processing), the more likely the word will be remembered for later use...Conversely, techniques that only require relatively shallow processing, such as repeatedly writing a word on a page, do not seem to facilitate retention as well (p. 120).

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What we understand from Schmitt's description is that a learner should be engaged in more conscious effort with new vocabulary and the more effort is put into it the more successful retention will be. This is consistent with what happens when learners engage in corpus consultation when investigating particular words in the corpus. It is believed that learning through DDL technique involves making a learner use various cognitive skills. For instance, O'Sullivan (2007) discovers a range of cognitive processes which are involved when one carries out language queries and linguistic investigations in the corpus, such as: speculating, making hypotheses and predictions, noticing, engaging in reflection, drawing inferences, among many others. It is reasonable, therefore, to expect that learners who use all these processes when investigating words in the corpus will result in successful retention compared to cases in which no or little effort is put in the processing of the newly encountered vocabulary. In addition, Reppen (2010) holds that learners who are involved in corpus consultation tasks in fact manipulate with language which in turn results in better retention of the language evidence they find and this is in agreement with what ESL research suggests.

Another key issue in word retention is that of exposure to new lexical items. According to Schmitt (2010) one needs to encounter a word at least several times in order to be retained successfully and one way to do this is through reading. However, one drawback of exposure to new items through reading is that it takes a lot of time and an enormous amount of reading before one is exposed to these many encounters of lexical items. Concordance lines are seen as a solution to this issue (see Cobb, 1999). According to Quan (2016), having learners exposed to numerous concordance lines in the corpus for a single lexical item may result in "focused repetitions of the target word, as learners are offered the opportunity to go through a number of examples in a short time, which may take years for them to meet via conventional reading" (p. 277). Nation and Chung (2009) argue that a learner not only encounters a word in many contexts in the corpus as he does in regular readings but he can also make useful generalizations about it from many examples available as well as draw better inferences about its meaning.

#### **1.2** The need for receptive and productive knowledge of vocabulary

It is important for language learners not only to be able to comprehend or recognize words when encountering them (receptive knowledge of words), but also they should be able to recall words and use them in their output, e.g. writing (productive knowledge of words). Cook (2016) briefly and clearly summarizes what knowing a word generally entails; that is, "we don't know a word properly until we have learnt its forms, its different types of meaning and the ways in which it is used in sentences" (p. 80). This is especially important for university students. It is understandable that we cannot expect students to know all the words productively, especially low-frequency ones, but nevertheless, they need to be able to know and use a vast number of vocabulary both receptively and productively to succeed in university settings and beyond.

A common problem in traditional educational settings is that learners need to undergo multiple exposures to target words before they start using them productively, i.e. in their speech or writing. One way of accomplishing this is through reading or implicit vocabulary approach. However, this takes time, and as we will see in the discussion of implicit/explicit vocabulary learning later in the next chapter, one cannot rely on improving vocabulary knowledge through reading only if extensive vocabulary improvement is the goal. This is due to time constraints university students usually face (see Cobb, 1999, for similar discussion on this issue).

Using DDL and corpora for the purpose of vocabulary improvement may provide more comprehensive vocabulary learning opportunities. Concordance lines and various features of corpora can offer a wide array of insights about a particular lexical item, such as its grammar, collocational information, multiple senses, frequent contexts it appears, its forms, and how it is used in real situations (Nation & Chung, 2009). Corpus consultation provides the learner with both real language situations in which a word is used as well as a wide range of example sentences for any word he or she would like to investigate (O'Keeffe & McCarthy, 2010). Last

but not least, learners who are exposed to real language and multiple examples for a particular word "can develop awareness of how the word is used in real situations" (Quan, 2016, para. 10). By having all these learning opportunities through DDL and by taking advantage of these useful features of corpora, it is reasonable to hypothesize that learners may develop better receptive and productive knowledge of vocabulary. Moreover, it is reasonable to believe that learners who are exposed to so many concordance lines for a word in multiple contexts: (1) may lead to better understanding of word meaning(s), and (2) may increase the chance of developing productive vocabulary skills, such the ability to use words in sentences, faster and more successfully compared to more traditional methods and practices. However, these are only suppositions which remain to be proven through empirical data which is one of the aims of current study.

### 1.3 DDL and latest teaching and learning trends

DDL or learning language through corpus data is seen as a technique that coincides with some new developments and trends in the language teaching and learning. The technique is particularly known for promoting learner-centeredness by having students carry out language investigations with corpus data. In a typical DDL classroom, the learner is seen as a 'researcher' who is expected to analyze the corpus data as well as make generalizations about the linguistic aspect they are investigating (Ebeling, 2009), whereas the teacher, on the other hand, is mostly seen as a "facilitator of language study rather than a traditional language teacher" (Warren, 2016, p. 337). This distinguishing principle of DDL which gives learners a greater role in the language classroom is consistent with the student-centered approach (characteristic of Communicative Language Teaching methods) which is currently gaining momentum in many educational settings around the world.

The learner-centeredness promoted by DDL and its exploratory nature is also believed to foster learner autonomy (Warren, 2016). Students are expected to hypothesize, investigate, and make

generalizations on various linguistic inquiries more autonomously. In addition, one of the aims of DDL is to have learners continue using corpora for language investigation beyond the classroom. Lastly, as we will see later in the literature review chapter, DDL is also consistent with Task-Based Teaching considering that both methods are underpinned by the theory of *constructivism*, a well-known teaching philosophy which sees learners as individuals who are active participants in constructing their knowledge rather than being simple "receptacles of the teacher's knowledge" (Larsen-Freeman and Anderson, 2011).

#### **1.4 Reference tool vs. learning tool**

Since the invention of DDL various studies have been conducted to investigate different areas of language. Based on the many discussions in the literature which report on these studies, they could be classified into three main categories: studies that have used corpora as reference tools (as we do with dictionaries), those that have explored learners' attitudes towards corpus use; and the ones which have investigated actual learning or performance.

Research that have investigated the use of corpora as reference tools and those that have explored learners' attitudes towards corpus use are the most dominant in the literature. For instance, there are many studies (e.g. Gilmore, 2009; Mull, 2013; Luo & Liao; 2015) which have investigated corpus consultation for the purpose of correcting errors in essays and thus have essentially focused on using corpora as reference tools as well as investigating learners' attitudes towards them. Generally, they all indicate positive results and positive learners' attitudes towards corpora as reference tools.

However, studies that have focused on investigating whether any learning results from learners engaging in corpus enquiries are much fewer. Gilquin and Granger (2010) maintain that based on extensive research to date corpora have proven to be beneficial to the learner, but only as reference tools and that whether corpus consultation leads to proficiency or learning is an area which needs further research. Discussing the benefits of concordance lines in vocabulary learning, Nation and Chung (2009) report that research shows that learners have positive perception of using concordance lines, but argue that studies that investigate learning through corpora are still lacking. Similarly, Flowerdew (2015) reveals that research has been mainly focused on how learners view corpora as tools, but it is short of revealing how much learning takes place when learners engage in corpus consultation.

It is thus evident that learning through corpora, including vocabulary learning, is an area which needs further research. Perhaps this is one of the strongest reasons why corpora have not yet found their way in the language classroom. The present study is mostly concerned with learning through corpus; more specifically, whether corpus consultation leads to successful vocabulary learning among university students.

### **1.5 Research Aims**

Considering the issues discussed in this opening section, the present study has several aims; these are as follows:

- To investigate whether learning word parts with the help of corpora leads to successful vocabulary expansion among university EFL learners
- To explore if teaching and learning vocabulary by using corpora results in better retention compared to traditional practices.
- To investigate whether teaching and learning vocabulary through DDL lead to better receptive and productive vocabulary knowledge compared to traditional teaching and learning practices.
- To explore learners' experiences, attitudes, preferences, and obstacles while engaging in corpus investigations for the purpose of exploring and learning words with affixes.

## **1.6 Hypotheses**

This study is set out to examine the following two main hypotheses:

- Teaching and learning vocabulary with the help of corpora lead to better vocabulary retention among EFL learners compared to traditional practices.
- Teaching and learning vocabulary with the help of corpora result in better receptive and productive vocabulary knowledge among EFL learners compared to traditional practices.

### **1.7 Research Questions**

This study will be conducted having several research questions in mind. These are as follows:

1. Is there a difference in retention between learners who learn vocabulary (word parts) with the help of corpora and those who learn through traditional practices?

2. Is there a difference in receptive and productive vocabulary knowledge between learners who learn vocabulary with the help of corpora and those who learn through traditional practices?

3. What are learners' experiences and attitudes towards using corpora in vocabulary learning?

4. What are some advantages and obstacles to teaching and learning vocabulary (word parts) through corpora?

#### 1.8 The significance of the present study

The current study is significant in many ways. What follows are some contributions this research is expected to make in the field of DDL and vocabulary learning.

1. This research is expected to shed more light on DDL and ways it can contribute to vocabulary learning. More specifically, it is expected to reveal whether corpora can be used to teach and learn word forms successfully. The study, however, is not intended to prove that word forms are useful to vocabulary development as that has already been proven with extensive research (see section *2.1.3* below), but rather to test whether corpus-driven approach to teaching and learning word forms lead to better vocabulary improvement compared to traditional practices. The study aims to promote alternative and complementary approaches to vocabulary learning which would eventually enrich the language classroom with various teaching options for teachers to choose from.

2. As the focus of SLA has recently shifted its main focus from methodologies and teaching materials to the learner (Yule, 2014), this study also aims to explore the learners' beliefs and perception of corpora, especially when it comes to learning word parts with the help of concordance lines and corpus data.

3. The study is also expected to improve our understanding of vocabulary learning in general. It addresses two complex issues in the field, that is, vocabulary retention and the receptive and productive vocabulary knowledge. The results could provide us with valuable insights into how these may be achieved more effectively.

4. As pointed out earlier, studies have generally focused on researching corpora as reference tools as well as exploring learners' views and attitudes towards them whereas those which investigate performance or learning are generally lacking. The current research is expected to make a modest but valuable contribution to the area of DDL.

### 1.9 The structure of the thesis

This thesis has six chapters in total and they include as follows:

Chapter one addresses the importance of vocabulary development among university students by emphasizing two crucial aspects of vocabulary learning: retention and the receptive / productive dichotomy. The chapter also describes how the present study fits in the existing research in the area and provides reasons for its relevance in the field of SLA.

In chapter two, i.e. literature review, a theoretical background for the study is provided. We firstly discuss theoretical issues related to vocabulary learning in general. Then we move on to discuss DDL as a technique, relevant to our research.

In chapter three, we proceed with describing the methodology used throughout this study. More precisely, we provide information on the participants, the research design, research settings, and materials, among others. In addition to these, a detailed description of the results of the pilot study conducted prior to the current study is provided.

Chapter four includes the overall results of the research. That includes a detailed description of performance tests results, results from the questionnaire used with the experimental group participants, and a discussion on the self-reflection papers in which some participants were asked to report on their experience with corpora and DDL.

In chapter five we analyze the results by relating them to the relevant theories and comparing the findings with other similar studies. But most primarily, the chapter is reserved to provide answers for the research questions as well as confirm or deny the two hypotheses used in this research. In addition, the discussion will be finalized by discussing the pedagogical implications these results have on teaching and learning vocabulary through DDL. Chapter six summarizes the findings, provides some limitations of the current study and recommends ideas on further research in the field.

## **2. LITERATURE REVIEW**

#### 2.1 VOCABULARY LEARNING IN SECOND LANGUAGE ACQUISITION (SLA)

Vocabulary learning used to be neglected for quite some time in the past and language learners were expected to acquire new vocabulary incidentally from reading. After this era of negligence, vocabulary teaching and learning have increasingly gained attention in the last decades. Gass and Selinker (2008) report that the tendency to ignore vocabulary, while emphasizing other aspects of language, is now rapidly changing and vocabulary is seen as a vital linguistic unit by language theories. They offer the following reasons as to why words matter in language learning process:

...there are various reasons for saying that the lexicon is important for second language learners. Both learners and native speakers recognize the importance of getting the words right and lexical errors are numerous and disruptive. In general, learners need good lexical skills to produce sentences and to understand them (p. 450-451).

Richards and Renandya (2002) maintain that learners who don't engage in vocabulary learning activities and do not take advantage of vocabulary learning strategies can miss using their language learning capacity and this may lead to demotivation during their language learning process. Therefore, vocabulary is now regarded as vital component in effective language learning (Nunan, 2015) and language classrooms devote more and more time to teaching lexis whereas language textbooks offer adequate focus-on-word units or sections as well as various vocabulary learning strategies and exercises.

#### 2.1.1 Incidental vs. Explicit vocabulary learning

A major distinction is made between incidental and explicit vocabulary learning in the second or foreign language learning. The dichotomy has generated a lot of discussion among language learning and teaching theorists and practitioners as to which is more important, which contributes more to vocabulary learning, and so on. We discuss some of these issues below.

Incidental or implicit vocabulary learning is defined as "learning that occurs when the mind is focused elsewhere, such as on understanding a text or using language for communicative purposes" (Celce-Murcia, 2001, p. 289). This approach to vocabulary acquisition was mostly dominant during the emergence and the increasing domination of communicative approach in the late 20<sup>th</sup> century in which communication in the target was the main focus. As grammar was taught implicitly, vocabulary, in a very similar way, was taught and learned through communication and language use, i.e. incidentally. According to Schmitt (2000), incidental or implicit vocabulary learning takes place while one makes use of language in communication and consequently benefits in terms of mastery of communication and vocabulary gains. However, Schmitt points out that this approach to learning lexis is rather slower compared to the explicit approach in which attention contributes to better efficiency. Unintentional lexical growth is also experienced through extensive reading (see Nation & Chung, 2009) in which readers enhance their lexis naturally by constantly being exposed to new words and by guessing word meanings from context.

In contrast to implicit learning, explicit or intentional vocabulary learning has "students engage in activities that focus attention on vocabulary" (DeCarrico, 2001, p. 286). As we mentioned earlier, this approach to lexical expansion has become particularly prevalent in the last two decades drawing the attention of many researchers, textbooks writers, and practitioners. Schmitt (2000) mentions two ways explicit vocabulary learning benefits the learner. One is that paying attention to certain words raises the chance of learning them. Secondly, it is now established, based on some data drawn from the field of psychology, that the more learners devote their mental attention to certain words the better they are retained in the long-term memory. As a result of increased focus on explicit vocabulary learning in language education in the recent time, additional focus has been paid to vocabulary learning techniques and strategies one of which will be discussed later in this chapter. The implicit / explicit dichotomy raises the question of which approach contributes more to vocabulary acquisition among language learners. Laufer (2010) discusses the traditional views held by language input proponents who claim that most of L2 lexis is acquired through input, such as reading, instead of learning words individually or out of context. Referring to some figures from his own research, Laufer provides some convincing evidence that this is not the case. His study revealed that: sufficient input does not automatically translate into spotting new lexis; if new lexis is spotted than that does not always guarantee guessing their meaning; the new spotted lexis is not always retained; and that in order for a learner to acquire new vocabulary through input he or she should be exposed to a vast amount of input which is impossible in a normal classroom setting. Hunt and Beglar (2000), in contrast, hold a more balanced view on this issue. Their claim is that implicit vocabulary learning contributes more to language learning, but only in a long-term perspective. In addition to this claim, they also emphasize the fact that explicit learning of words accounts for a large part of learner's overall vocabulary knowledge. Favoring one approach over the other is not as simple as it seems since both have their special advantages which cannot be ignored. Schmitt (2010) lists several distinct benefits a learner sees from one or the other. For him, explicit learning of vocabulary has the following advantages:

- "generally leads to more robust and faster learning;
- generally involves deeper engagement leading to better retention;
- can focus on important vocabulary selected by the teacher (e.g. high frequency, technical, targeted).

Among the advantages of implicit vocabulary learning, in contrast, he lists the following:

- can address words which cannot be explicitly taught for time reasons;
- fills out the kinds of contextual word knowledge which cannot easily be explicitly taught;
- provides recycling for words already taught explicitly;
- vocabulary learning occurs while improving other language skill areas (e.g. reading)". (p. 40)

The discussion above clearly suggests that both implicit and intentional vocabulary learning approaches are important to the learner in order for him to acquire sufficient lexical knowledge, both in terms of quantity and quality, which are necessary for successful language comprehension and production. This view is also supported by Schmitt (2000) who states: "the consensus is that, for second language learners at least, both explicit and incidental learning are necessary, and should be seen as complementary" (p. 120).

The discussion so far leads us to the ultimate question of how one should balance between implicit and explicit teaching of new vocabulary. According to Nation (1995, cited in Schmitt 2000) choosing between one and the other mainly depends on what it takes to learn certain vocabulary as well as on the frequency of the vocabulary. That is to say, one should teach some words explicitly if they are frequent or important to the learner whereas some others, such as rare words in language, may be left to implicit learning. DeCarrico (2001) reports that numerous researchers support the idea that a learner should begin with intentional vocabulary learning in the initial phase of language learning until he or she builds a word foundation of two to three thousands of most common words. After this critical threshold, the learner can turn to incidental or implicit vocabulary learning through input, such as listening and reading. However, this may not apply to all kinds of learners and various learning environments they are in. DeCarrico mentions university students as an example. As it is well-known, university students are required to master vast number of vocabulary, be that general or academic, in a short time period. It is unreasonable to expect students to master a lot of vocabulary relying solely on input and incidental vocabulary learning. Not to mention students enrolled in English Language Programs whose English is a foreign language. Both extensive implicit and explicit vocabulary acquisition are a must in order for them to achieve the language proficiency necessary for their future careers.

When it comes to teaching and learning words with affixes, i.e. prefixes and suffixes, similar approach may be applied. That is to say, students may be primarily introduced to the most frequent affixes of English (such as the negative *un*-) with some most frequently-occurring

words (e.g. *unemployment*) and these should be taught and learned explicitly. On the contrary, the less frequent ones may be left on the learner to notice incidentally through input, be that reading or listening.

#### 2.1.2 Vocabulary learning strategies

Vocabulary learning strategies have been widely discussed in the literature and they are typically viewed as vital in the development of vocabulary among language learners. Cook (2016) distinguishes between word comprehension strategies and vocabulary learning strategies. The former includes: guessing the meaning of words from its contexts, using a dictionary, inferring the meaning of words from their affixes, and using cognates as a strategy to understand meanings of words. From the vocabulary learning strategies, on the other hand, he lists: learning words by heart; organizing the lexicon in our minds in meaningful groups, such as in word families or words that have common prefix or suffix; and using the Keyword Method. Next, we discuss word forms (words with affixes) as they are the focus of this study.

#### 2.1.3 Word forms in English and their importance in vocabulary development

By word forms or affixation in English language we typically understand the derivational prefixes and suffixes we find attached in many English words. An infix is also another type of affix, but mostly characteristic of other languages and arguably only few infixes exist in English (Yule, 2014). Some of the English affixes are easily found both as separate entries as well as combined with words in contemporary English dictionaries, but not all of them can be found in them. Alternatively, a few dictionaries of English affixes have been devised (e.g. Sheehan, 2000) which can be used to find a more comprehensive list of prefixes and suffixes.

Various vocabulary textbooks that are either completely or partly dedicated to word part strategy have been published in the last decades. One of these, for instance, is a part of well-known *COBUILD* series in the 90s named *Collins COBUILD English Guides 2: Word Formation* (Bradbury, 1991). To our knowledge, this is the most comprehensive textbook with English affixes intended for language learners. It has been developed using *Birmingham* and *Times Corpus* to find words that frequently occur with English affixes. It contains around three hundred affixes and it is organized in an A to Z dictionary style layout, but more comprehensive, by including extra explanation for each affix, lists of words that frequently occur with each affix, and several corpus examples for each entry. Other textbooks (e.g. McCarthy & O'dell, 1994; Redman, 2003) dedicate only sections to word parts by providing useful additional practice tasks.

There is something pedagogically very useful about word parts in English; that is, there is a connection between their morphology and meaning. For instance, in Bradbury (1991) we find that words with the prefix *extra*- can be categorized into two groups and the words belonging to each group share similar meaning. The first group of words occur with this prefix to form adjectives which partly mean 'more than usual' or 'very'; these include words like: *extra-bright* (which means very bright), *extra-thin, extra-soft, extra-large,* and so on. The other group of words occurs with this prefix to form other adjectives which partially mean 'beyond' or 'outside'; these include words like: *extraderrestrial* (related to something that live beyond earth), *extrajudicial, extramarital, extra-curricular* etc. Therefore, this organized grouping of words in terms of similar morphology as well as similar meaning can contribute to vocabulary expansion among EFL learners.

English language learners can use the word part strategy and knowledge in many ways, be that in comprehension, word expansion, or production. Relying on research, McCarthy, O'Keeffe, and Walsh (2010) maintain that although communicative approaches oppose focus on form, word forms are useful in that they may tremendously boost learner's vocabulary in a short time period. According to Bradbury (1991), there are two benefits a learner may experience from

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using word parts: (1) once a learner comprehends the meaning of an affix then he is able to infer the meaning of other unknown words that occur with it; (2) another advantage is that given the productive nature of some affixes, learners are free to compose new words with them. For instance, the productive prefix anti- can be combined with various nouns and adjectives to form new words that may not be found in contemporary dictionaries; a learner, for example, is free to say "I am anti-FIFA" to express his opposition and dissatisfaction with the international football federation. Word parts are also suitable for the way human brain processes the new vocabulary. Cook (2016) maintains that the brain is most likely to receive and retain those words which are more organized in some way rather than those that are unsystematic. As an illustration, he mentions a group of new words which are related around one single idea or topic (such as hiking equipment). In a similar way, he suggests word parts as a suitable strategy for brain processing and retention. However, Cook also warns that relying on the common relationship between word form and meaning is not always reliable. For instance, although the prefix *dis*- usefully combines with numerous words to express oppositeness, such as in *disagree* or *disbelief*, this is not the case with some other words, such as *discourse* in which dis has nothing to do with oppositeness. It is thus necessary to make learners aware of these exceptions in order to avoid possible cases of overgeneralization.

There have been numerous studies which have investigated the use of word parts in vocabulary growth. In a study conducted by Hasani, Mousavi, and Zarei (2014) with their EFL learners it was found that their improving performance in vocabulary acquisition was linked to their growing knowledge of affixes. Mochizuki and Aizawa (2000) found in their research that there is a correlation between vocabulary quantity and the second language learners' understanding of word parts. Kim (2013) had one experimental group being taught word parts explicitly and another was taught implicitly. His study revealed that the students who learned word parts intentionally outperformed the control group in the posttest. Similarly, Buddingh's (2005) research data indicated that low performance learners of English who were taught affixation explicitly scored significantly better than those taught incidentally. What these studies clearly
indicate is the fact that word part strategy has more or less a positive effect on vocabulary development and performance among language learners.

Besides vast research on using the word part strategy with language learners, studies using corpora for this purpose are lacking. To our knowledge, there is no study to have investigated the teaching and learning vocabulary through word part strategy with the help of corpora. As we will see later in this chapter, modern computer corpora, such as *IntelliText*, provide advanced queries for anyone wishing to explore and analyze affixes including language learners. These new tools provide useful frequency lists of words with certain affixes as well as hundreds of concordance lines for each word at a click of a button and they offer great learning opportunities for EFL learners who wish to expand their vocabulary. The current study, therefore, aims to fill the research gap in this area by investigating the effects of learning word parts with the help of corpora.

#### 2.1.4 Vocabulary knowledge

There have been various attempts to categorize a learner's vocabulary knowledge. Two of the most prominent ones are the breadth and depth of vocabulary knowledge and the receptive/productive or the passive/active knowledge of vocabulary. In this section the latter will be discussed in more detail since it is on the focus of the present study.

Receptive / productive vocabulary knowledge has been described in various ways. According to Richards and Schmidt (2010), receptive and productive knowledge of vocabulary involves "the number of words that a person can use actively, compared with the number of words that they recognize and understand but do not use productively" (p. 462). Similarly, for McCarthy et al., (2010) vocabulary can be learnt for receptive use, which means "being able to recognize it and understand it in a text without necessarily knowing how to use it yourself", and for productive use, meaning "not only being able to recognize it and understand it, but being able to use it

correctly and appropriately when you speak or write" (p. 159). In other words, a receptive knowledge of a word shows the ability to understand it in listening and reading, while the ability to use vocabulary productively entails the ability to use it beyond recognition, i.e. in writing and speaking.

These definitions, however, provide a more general description of receptive/productive dichotomy and there have been continuous attempts for more detailed description of what exactly the two terms entail. The most comprehensive one is that of Nation (2000). For illustration, he provides a more thorough picture of what knowledge of the word *underdeveloped* would be involved from both perspectives. According to Nation, knowing and using the word *underdeveloped* receptively means:

- "being able to recognize the word when it is heard
- being familiar with its written form so that it is recognized when it is met in reading
- recognizing that it is made up of the parts under-, -develop- and -ed and being able to relate these parts to its meaning
- knowing that underdeveloped signals a particular meaning
- knowing what the word means in the particular context in which it has just occurred
- knowing the concept behind the word which will allow understanding in a variety of contexts
- knowing that there are related words like overdeveloped, backward and challenged
- being able to recognize that underdeveloped has been used correctly in the sentence in which occurs
- being able to recognize that words such as territories and areas are typical collocations

 knowing that underdeveloped is not an uncommon word and is not a pejorative word

Knowing and using the word productively, on the other hand, means:

- being able to say it with correct pronunciation including stress
- being able to write it with correct spelling
- being able to construct it using the right word parts in their appropriate forms
- being able to produce the word to express the meaning "underdeveloped"
- being able to produce the word in different contexts to express the range of meanings of underdeveloped
- being able to produce synonyms and opposites for underdeveloped
- being able to use the word correctly in an original sentence
- being able to produce words that commonly occur with it
- being able to decide to use or not use the word to suit the degree of formality of the situation..."(p. 41-42)

Nation's list is quite clear in terms of what a learner should know about a word in order to reach his or her word knowledge at an advanced level. One thing that is also evident from the list, but also from our common language class experience, is that it would be easier for a learner to acquire receptive knowledge compared to the productive one. For instance, it would be easier for one to recognize a word before he could say it with the right pronunciation or correct stress. Nation points out that a learner would need additional effort as well as practice to use words in speech and writing. In addition to these, learners are believed to have more receptive competence than productive one (Gass and Selinker, 2008). Based on these arguments, it is also reasonable to claim that receptive vocabulary knowledge is typically mastered before productive knowledge. This assertion is supported by Schmitt (2010) who holds that one moves from not knowing a word to receptive knowledge and then to productive knowledge of that word. A similar point is made by Melka (1997; as cited in Schmitt, 2010) who

sees receptive/productive vocabulary knowledge duality on a cline rather than opposition. For him, the more effort a learner puts to learning about a word the more he gradually moves from a receptive to a productive knowledge of that word.

Nation's comprehensive illustration of what receptive and productive knowledge of a word would practically involve offers a useful guide for us when it comes to distinguishing between the two concepts. One thing we can also conclude from the discussion above is that a learner needs time and extensive exposure to a word before he masters all these aspects of word knowledge. Therefore, we cannot expect a learner to miraculously master all these aspects in a very short period of time. In terms of measuring learner's level of mastery of words, on the other hand, Nation's list given above provides a good basis for testing one's vocabulary learning progress. The current study aims to use Nation's classification to assess the participants' vocabulary receptive / productive knowledge gains. At this point, it is important to point out that the study intends to measure only a few aspects of receptive/productive vocabulary knowledge of the participants since measuring all aspects at once would be impossible (see Schmitt, 2010). A more detailed description of the tests and what they consist of will be given in chapter three.

### 2.1.5 Vocabulary retention

One of the most challenging issues in vocabulary acquisition is retaining the vocabulary one wants to learn. Without retention, vocabulary covered in class or communicative settings would be useless. Learning is, in a way, synonymous with retention when it comes to vocabulary. As Thombury (2002) rightly put it "learning is remembering" (p. 23). Quite similarly, Schmitt (2010) argues that immediate posttests after vocabulary instructions in research typically tell us what the student noticed, but it is the delayed tests which tell us whether acquisition has taken place. That is to say, learning is the type of knowledge, such as vocabulary knowledge, a learner retrieves successfully for future use, be that for the purpose of comprehension or production.

Thombury (2002) devotes a useful section on how words are retrieved. Firstly, he discusses the well-known cognitive processes in remembering information drawn from psychology. The brain, although this may not resemble the way we understand it physically, has mainly two memories: a temporary and a lasting memory. The temporary memory usually holds the information for a very short time and then loses it. Long-term memory, in contrast, stores the information and it is available for future recall. A valid question would be: how do we make our brains store new vocabulary in the long-term memory? Drawing on various studies and theories, Thombury discusses many ways to achieve that. One way to retrieve our vocabulary could be achieved by repeating a word or encountering a word many times in reading texts. One could also retrieve words he or she has just learned by using them in sentences. In addition, using the words in an interesting or meaningful way or thinking about the vocabulary in more depth are seen as useful ways to ensure long-term retention. Here's how DeCarrico (2001) explain the importance of processing the new lexis:

Another consideration in teaching vocabulary is promoting a deep level of processing...the importance of promoting a deep level of processing is to transfer information from short-term memory to long-term memory, which has almost unlimited storage capacity. The more students manipulate and think about a word, the more likely it is that the word will be transferred into long-term memory (p. 289).

What we clearly understand from this discussion is that successful vocabulary learning requires more than simple exposure or simple rote memorization of words which may not be sufficient to ensure long lasting retention and the ability to recall them whenever necessary. The more useful cognitive processes one uses, the better are the chances of having our new vocabulary knowledge moved into the long-term memory.

#### **2.2 CORPORA AND CORPUS LINGUISTICS**

The term *corpus*, the plural of which is *corpora*, has been in use for quite some time now. But firstly, we should make a difference between a simple corpus in a classical sense on the one hand and electronic corpus, on the other. The first can simply be any collection of text used for a particular purpose, such as language analysis, and it has been exploited since long time back in history. Since the invention of computers and corpus became computer readable, however, the term *corpus* or *corpora* has exclusively been referred to as "computer-mediated" (Cheng, 2012, p.6) corpora. As the main focus of this study is electronic corpora, from now on the term *corpus* and *corpora* will be used to refer to the contemporary electronic ones. In addition, we should also note the difference between the collection of text in digital version and the software that could use the same to analyze and launch various linguistic queries. For the sake of simplicity, therefore, the terms *corpus* and *corpora* will encompass both of these components in our discussion. In cases when we refer to the collection of text only, such as *the British National Corpus*, we will use the terms *text corpus* or *text corpora* to distinguish it from the software part which we will refer to as *web interface*.

### 2.2.1 Defining Corpora

There have been various definitions for the term corpus. Cheng (2012) defines it as "a collection of texts that has been compiled to represent a particular use of a language and it is made accessible by means of corpus linguistic software that allows the user to search for a variety of language features" (p. 6). According to Richards and Schmidt (2010), a corpus is:

A collection of naturally occurring samples of language which have been collected and collated for easy access by researchers and materials developers who want to know how words and other linguistic items are actually used. A corpus may vary from a few sentences to a set of written texts or recordings. In language analysis corpuses usually consist of a relatively large, planned collection of texts or parts of texts, stored and accessed by computer. A corpus is designed to represent different types of language use, e.g. casual conversation, business letters, ESP texts (p. 137).

For Tognini-Bonelli (2001), corpus represents:

"...a collection of texts assumed to be representative of a given language put together so that it can be used for linguistic analysis. Usually the assumption is that the language stored in a corpus is naturally-occurring, that it is gathered according to explicit design criteria, with a specific purpose in mind, and with a claim to represent larger chunks of language selected according to a specific typology (p. 2).

### 2.2.2 Corpora and Corpus Linguistics

Corpora have enormously improved the way we analyze language forms and use in terms of ease, efficiency, and quality. In other words, language investigation, by the help of advanced computer software, has become accessible to everyone, be that an expert, teacher, or even a learner; statistics on linguistic forms and language use are available at the touch of a button; and the insights about nature of language are more reliable than ever before. Computer corpora today can provide language enquiries that are very hard or even impossible to carry out otherwise. In order to illustrate these, let's see few examples of what corpora can do for us today.

*Figure 2.1* shows how a corpus can provide various insights on word formation using meaningful affixes. Note that words are arranged according to their frequency indicating the most frequent 'isms' in American English. In addition, thousands of contexts are available for each word to look for further insights, such as patterning, collocation, verb heads etc.

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SEE CONTEXT:	CLICK ON WOR	D OR SELECT WORDS + [CONTEXT] [HELP]		COMPARE
		CONTEXT	FREQ	
1		CRITICISM	18793	
2		TERRORISM	16835	
3		MECHANISM	9057	
4		RACISM	8846	
5		JOURNALISM	7379	
6		TOURISM	7072	
7		CAPITALISM	6374	
8		OPTIMISM	5508	
9		NATIONALISM	5148	
10		COMMUNISM	4947	
11		AUTISM	4459	
12		SKEPTICISM	3638	
13		ACTIVISM	3556	
14		SOCIALISM	3537	
15		REALISM	3343	

Figure 2.1 An excerpt from Corpus of Contemporary American English (COCA) showing the most frequent words that combine with the suffix '-ism' in American English (Davies, 2008-)

*Figure 2.2* below shows how concordance lines of the phrase 'a shred of' can be used to look for different contexts (in concordance lines) this particular phrase typically appears. As the lines are sorted (alphabetically) to the right of the phrase, we can see that 'a shred of' normally collocates with the word *evidence*, but it could also collocate with the words *proof*, *belief*, *help* etc.

nt, and wants an explanation. 'There was not	a shred of	any sort of case against me,' he says. Mr Anders
ney could do to stop it; the players had hardly	a shred of	belief left in themselves, and Gower was unable
ne didn't know what he would do; he had not	a shred of	evidence. But no. 'Very well,' she announced.
d making accusations which, since she hadn't	a shred of	evidence, could only lead to trouble. This nonse
n been heard on opposition hustings, but not	a shred of	evidence exists that his hands dipped anywhere
self had clearly made for confusion. Without	a shred of	evidence he had employed an innuendo when v
putting these emotive labels on him without	a shred of	evidence that he presents a risk to the children
to the riddle, no sign of the Templars and not	a shred of	evidence to indicate where the Grail or Excalibu
ess of admitting, he had so far assembled not	a shred of	evidence to support his claim. 'When I found ou
But I don't see that either of us could produce	a shred of	evidence to support our extremely unlikely thes
sband and wife took other lovers, there is not	a shred of	evidence to support such a theory. Physically, M
o would fondly remember (although without	a shred of	evidence to support their claim) how flogging h
f every 30 people out of work, 29 will not get	a shred of	help at all from the Budget' Attacking what he
into bombs in the Gulf on Monday — without	a shred of	ministry paperwork intruding at any point. Glas
assured us that up till now they have not seen	a shred of	proof. As the accompanying article by a Yugosla
, then looked at him intently. 'But there's not	a shred of	proof, is there?' 'None,' he responded bleakly.
nity. I was happy to admire this. There wasn't	a shred of	self-pity there. You could say at the last he had
n information-technology Concorde'. There is	a shred of	substance in these claims. In particular, the proj
'Difficult. Very difficult.' He picked	a shred of	tobacco off his lip. 'Especially if you won't say w
rent women I do not know whether there is	a shred of	$\ensuremath{\mbox{truth}}$ in the allegations. But if there is, one thing

Figure 2.2 An excerpt from British National Corpus (BNC) providing collocations for the phrase 'a shred of' in British English (Dickinson & Francis, 2009)

Corpora today can provide useful information on the use of words and phrases across different genres. *Figure 2.3*, for instance, shows in what genres the phrase 'I guess' is mostly common. As the results indicate, this particular phrase is mostly used in spoken language as well as in fiction. Note that it is rarely used in academic discourse.

😑 🞰 Corpus of Contemporary American English 👔 📄 🛃 🛃										
SEARCH	CHART				CONTEXT	HELP				
SECTION (CLICK FOR SUB-SECTIONS) (SEE ALL SECTIONS AT ONCE)	FREQ	SIZE (M)	PER MIL	CLICK FO	R CONTEXT (SEE ALL)					
SPOKEN	22,212	109.4	203.05							
FICTION	12,850	104.9	122.50							
MAGAZINE	2,286	110.1	20.76							
NEWSPAPER	3,061	106.0	28.89							
ACADEMIC	550	103.4	5.32							



The illustrations and examples above provide us with only a glimpse of what corpora are capable of doing to investigate language structure and use. Corpora are getting more sophisticated as computer software advance on daily basis.

The invention of computer corpora has paved the way for Corpus Linguistics, which is considered 'a new scholarly enterprise' (Kennedy, 1998, p. 1) or "a relatively new approach in linguistics that has to do with the empirical study of 'real life' language use with the help of computers and electronic corpora" (Lüdeling & Kytö, 2008, p. v) and which relies on "a set of procedures, or methods" (McEnery & Hardie, 2011. p. 1). The variety features of corpora have enabled CL a much wider range of research questions available. As a result, CL is now engaged in performing a variety of analyses of linguistic forms and use, i.e. from lexis to genres (Cheng, 2012), as well as it can interact with other fields to do more complex investigations. For instance, learner corpora have been increasingly utilized to provide insights into SLA.

CL approach to language investigation has continuously shifted away from the traditional approach, i.e. language analysis based on intuition, and as Cheng (2012) rightly put it: "few people these days would want to argue that we can describe a language based on introspection or by fabricating examples" (p. 174). Some core features of corpus based approach to language investigation which distinguish it from the traditional approach are provided by Biber et al. (1998):

-"it is empirical, analyzing the actual patterns of use in natural texts;

 - it utilizes a large and principled collection of natural texts, known as "corpus," as the basis for analysis;

- it makes extensive use of computers for analysis, using both automatic and interactive techniques;

- it depends on both quantitative and qualitative analytical techniques". (p. 4)
 Similarly, Cheng (2012) provides several advantages of Corpus Linguistics in language inquiries
 in comparison with using intuition. One is that sufficient evidence in a corpus is much more

reliable and empirical rather than relying on inadequate examples. Secondly, CL uses authentic texts in language analysis instead of invented ones. Lastly, corpus is searchable by the help of computer software and this can guarantee statistical evidence in terms of frequency of occurrence, e.g. frequency of words. This method of analysis, however, has a number of limitations which should be mentioned, some of which are as follows: (1) if we do not find evidence in the corpus data, language corpora cannot tell us whether something, e.g. a pattern, is likely or not in a language; (2) they cannot provide data which they don't have, for instance, BNC (1991-1994) would not provide any data on the newly coined words; (3) corpora provide raw data and it's on the researcher, teacher or learner to interpret it (Hunston, 2002). These shortcomings are useful to consider when one undertakes corpus based research, but that still does not diminish the importance and the usefulness of corpora and corpus based inquiries.

The literature shows no consensus on the status of CL, which means that there has been an inconclusive debate on whether it is a method or a discipline. The former is typically referred to as 'corpus-based' while the latter as 'corpus-driven' approach (Tognini-Bonelli, 2001, p. 6). The essential difference lies on how linguists consider CL, i.e. an instrument or language theory (Cheng, 2012). Referring to Tognini-Bonelli (2001), Baker et al. (2006) offers a comprehensive summary of what distinguishes the two approaches:

The former uses a corpus as a source of examples to check researcher intuition or to examine the frequency and/or plausibility of the language contained within a smaller data set. The researcher does not question pre-existing traditional descriptive units and categories. A corpus-driven analysis is a more inductive process: the corpus itself is the data and the patterns in it are noted as a way of expressing regularities (and exceptions) in language. A corpus-driven analysis tends to only use minimal theoretical presuppositions about grammatical structure. (p. 49)

Data-Driven Learning (DDL), which is the main focus of the current study and which we turn to discuss in section 2.2.6 below, favors the corpus-driven approach. That is to say, in DDL one uses examples to infer rules about certain linguistic forms or use.



Figure 2.4: Corpus-driven and corpus-based approaches to CL (Cheng, 2012)

## 2.2.3 Types of text corpora

Since the creation of the first ever two computer readable corpora, the *LOB* corpus and the *Brown* corpus, and which were considered representatives of the two main varieties, the British and American English respectively, many other text corpora have been created to serve various linguistic and extra-linguistic purposes and studies. A distinction is made between two major types of corpora, the general corpora and specialized corpora. General text corpora, such as BNC and COCA, are designed to be balanced in terms of various genres and registers and thus are aimed to represent the whole language, British and American variety respectively. In contrast, specialized text corpora are designed to represent a particular genre or register and therefore serve a more specific language purpose or study. Corpora of these types include for instance: *British Academic Spoken English Corpus* (comprised of over 1 million words), *Shakespeare Corpus* (about 900 000 words and includes all Shakespeare's work), *International Corpus of Learner English* (over two million words — it includes almost all speeches of British Parliament), to name just a few. Thus, the type of corpus one needs, whether general or specialized, will depend on the purpose and the type of linguistic investigation. For more

inclusive and general studies, general corpora are more suitable a few of which we discuss below.

*The British National Corpus* (BNC) is one of the most well-known text corpora and it represents the British English variety. It was firstly released in 1994 after which two more editions followed, one in 2001 and another in 2007. BNC has about 100 million words and it is a balanced corpus as it includes both written (about 90 percent) and spoken language (about 10 percent). The written part includes various texts, such as academic books, journals, newspapers, fiction, student essays, among many other texts. The spoken transcriptions include both formal and informal spoken language recorded from business meetings, informal chats, radio talks, and so on. BNC is a synchronic corpus as it is a collection of language used at the end of the past century and thus it is not concerned with language development or change over time, as it is the case with diachronic corpora. Although it has been at least a decade since its last edition, BNC is still widely used in various linguistic investigations and it is found in many well-known corpus web interfaces, including *Sketch Engine, BYU* (Brigham Young University) *Corpus* etc.

The Corpus of Contemporary American English (Davies, 2008-) or COCA is another widelyknown corpus and, in contrast to BNC, it represents the American English variety. COCA contains over a half billion words and it is growing every year as about 20 million words are added annually. It is also a balanced corpus and contains both written and spoken language as well as various genres ranging from academic texts to newspapers and literary texts. COCA is mostly suitable for linguistic investigations and studies which focus on American English variety.

The current study focuses on the British variety and will hence have study participants use BNC as the sole text corpus to launch queries in their vocabulary investigations.

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### 2.2.4 Web interfaces

There are numerous web interfaces that are available online one can use to launch various linguistic investigations. Some of these online programs provide free access, others provide only limited subscription, while the rest charge their users for using their online services. What is important, however, is that today there are sufficient online corpus resources available that can be used for various purposes and studies. Moreover, the available web interfaces vary in terms of purpose and design and each suiting a specific user or aim. Some interfaces, for instance, are designed to suit everyone, be that a researcher or simple user who wants to investigate a certain aspect of language; some others are designed for language teachers and learners, and so on. In this section we will look at few web interfaces that are available online: *BYU Corpus, Skylight*, and *IntelliText 2.6*. More focus will be given to the later since it is the interface that this study aims to use.

### 2.2.4.1 BYU Corpus

Created and administered by Mark Davis, the Brigham Young University web interface (1994-) is, as the site itself claims, the most-widely used online corpus, claiming to have over 130 000 users monthly. By using BYU we can choose from various text corpora to carry out queries depending on what we are investigating. Some of these include: *Corpus of Contemporary American English* (COCA), *Global Web-Based English* (GloWbE), *Wikipedia Corpus*, *British National Corpus* (BNC), among many others.

Corpus of Contemporar	pus of Contemporary American English (					
SEARCH		CONTEXT				
List Chart Collocates Comp [POS] Find matching strings Reset Sections Texts/Virtual Sort	are KWIC /Limit Options	LIST of Find 3 patte searc each More synot	(HIDE HELP) display single words like mysterious, al rns like *break*, phrases like n th by synonyms (e.g. gorgeous) case, you see each individual n information: basic syntax, par nyms, customized word lists, ar			

Figure 2.5 BUY-COCA online interface

What is characteristic about this interface is its flexibility in terms of searching the corpus in many ways. For instance, searches may be both synchronic and diachronic. Other advantages include: its simple and impressive view of word lists, charts, and concordance lines; user-friendly searches and queries, and so on. BYU is suitable for all purposes and users, be that a researcher, teacher or language learner.

# 2.2.4.2 Skylight

As pointed out earlier, different web interfaces vary in terms of purpose and design and each suiting a specific user or aim. Skylight interface at this point is a specific one since it is designed to serve teachers and learners. Its layout and the ability to navigate have been simplified to make it user-friendly for its users considering that not every instructor or student is comfortable with complex queries and lots of corpus features.

Skylight a corpus tool for teachers and learners						
Log out < Back to information page	choose a corpus           ukWaC         •           1.4 billion words. Pages from the WWWeb, .uk dor	main, 2007.				
lines of output 50 100 250 500	type in a query word or phrase click <u>help</u> for a guide to writing queries 	Go Clear text				
O other (less than 500)		User manual (a full guide to Skylight and its corpora) Query help (a short guide to writing queries) Comments or problems? please email: support@skylight-to				

# Figure 2.6 Skylight Web Interface

A distinguishing feature of this interface is that concordance lines are all displayed in one page and one can scroll down the page in order to see the rest of lines. The number of concordance lines can be fixed between 50 to 500 lines and this feature is aimed for some learners who find too many lines confusing, or for some other who find the same insufficient. Moreover, the lines can be selected for print if teachers decide to use them in printed version rather than having students interact with the corpus directly.

# 2.2.4.3 IntelliText 2.6

*IntelliText 2.6* (Sharoff, 2014) is administered and maintained by the Centre for Translation Studies at University of Leeds. The corpus is entirely free for its users and it has been designed to serve a wider range of professionals, such as linguists and translators, as well as language learners and it is meant to serve studies in multiple disciplines, such as: Translation studies, language learning, studies in Linguistics, and those in History. Some of the text corpora available on *IntelliText* include: BNC, NEWS-GB (200 million-word corpus – a collection of

newspapers), INTERNET-EN (150 million-word corpus – English texts from internet), UKWAC (two billion-word corpus – UK-based web pages), among others.

	Centre for Translat	ion Studies	In	telliText 2.6		University of Leeds		
Home Page	Choose Language	Choose Corpora	Choose Type of Search	View Results	Build Your Own			
English BNC								
- Concorda	ince							
Sea Display ea	Search for Type a qu rch for matches anywh ch match at the mid Display up to 10 Search	ery (CQP or CSAR) her ere in a sentence dle of a context of matches with	e or use the Search Builder 60 chara 15 v per p mimimum c	sear sters age Show tota	ch Builder I number of matches F level A1 •			
+ Collocatio	on							
<ul> <li>Affixes</li> </ul>								
▹ Compare	Frequencies							
▶ Key Word	s and Phrases							
→ Multivaria	ate Analysis							
→ Genres								

Figure 2.7 IntelliText Web Interface

The interface allows the user to carry out various queries or language investigations. As we can see from the overview of *IntelliText's* concordance window shown in *Figure 2.7*, we can be provided with various language queries depending on what language aspect we want to investigate. The drop-down options allow general as well as specific or more advanced KWIC searches, for instance, collocational queries, affixes, queries in terms of genres, and so on.

The site puts a specific emphasis on the usefulness of *IntelliText* for language learners. According to its *EFL Language Tutorial* (n.d.), there are many ways the interface can benefit language learners. Some of these include:

- gain useful grammar insights
- confirm learners' hypotheses about language

- be able to see words in wider contexts and gain useful collocational information on words

- expand vocabulary

- investigate language in terms of various genres and register etc.

*IntelliText* has a special feature which allows EFL learners to search words based on affixes, i.e. prefixes and suffixes. While other interfaces allow similar searches by using the main KWIC in which special characters (e.g. hash or asterisk) must be used to find words with affixes, *IntelliText*, as we are going to see below, dedicates a special advance search box solely for this purpose in which these kind of words may be found simply by inserting the affix we want to search. Thus, this seems to be more appropriate for language learners rather than having them deal with special characters. According to the *EFL Language Tutorial*, having language learners use *IntelliText* to investigate words with affixes is a brilliant technique to develop their vocabulary. Moreover, exploring words with affixes with this specific feature of the corpus would boost EFL learners' vocabulary "by viewing productive patterns of word formation and the sometimes subtle distinctions of meaning that affixes introduce" (*IntelliText User Guide*, n.d., p. 9).

There are several steps to follow in order to carry out queries based on affixation as well as various options we can use along these stages. On the Home page (*Figure 2.8*) the user should select the option "Search the Standard Corpora" in order to enter the corpus.

	Centre for Translat	ion Studies		IntelliT	ext 2.6			
Home Page	Choose Language	Choose Corpora	Cho	oose Type of Search	View Results	Bu	uild Your Own	
				Search the Standard	d Corpora	>>		
				Build or Search Your	r Own Corpora	>>		
				Welcome		>>		
				Acknowledgements		>>		

Figure 2.8 IntelliText Homepage

Afterwards, *IntelliText* requires the user to select the language of the corpus (*Figure 2.9*) he intends to use in his queries. Besides English, the interface allows users to explore corpora in twelve other languages, such as Arabic, Chinese, French, German, and so on.

	Centre for Translat	tion Studies				
Home Page	Choose Language	Choose Corpora	Choose Type of Search		View Results	Build Your Own
				Arabic	>>	
				Chinese	>>	
				English	>>	
				French	>>	
				German	>>	

Figure 2.9 IntelliText Language Selection Page

After choosing English for our language queries, the page leads to a list of English text corpora that are accessible to the user. The inevitable question arises as to what type of text corpus we shall use for the purpose of studying words with affixes. The answer to this question is clearly given by Weisser (2016) who mentions that one should:

...distinguish between corpora that are compiled for general purpose research and such that are highly domain specific. The former are deemed representative of the whole language and generally to be used for a wide variety of different research objectives. The latter, in contrast, are often only of limited use to the general public, but may also sometimes be useful because they can highlight particular differences between standard language and specific registers, etc. (p. 21).

Based on this idea, it is reasonable to go with the general and balanced BNC as the most appropriate text corpus in the case of exploring words with affixes. This is due to the fact that concordance results in the case of words with affixes would be more trustful from a general and balanced corpus rather than from a specific corpus the results of which may be misleading.

	Centre for Transl	ation Studies	Int	elliText 2.6		University of Leed
Home Page	Choose Language	Choose Corpora	Choose Type of Sea	rch View Result	ts Build Your Own	
	Corpus	Descr	iption	Size (Millions of Words)	Link	Next >
	BNC	A balanced corpus of Br	itish English up to 1994	100	http://www.natcorp.ox.ac.uk	
	NEWS-GB	Collected from British ne	wspapers	200	/serge/publications/2006-coling-acl.pdf	
	INTERNET-EN	Internet texts in English		150 http://corpu		
	WIKI-EN	Wikipedia entries in Eng	lish	943	https://en.wikipedia.org/	
	UKWAC	UK-based web pages		2000	http://clic.cimec.unitn.it/marco/publication	s/wacky-lrej.pdf
	BLOGS-EN	Political blogs from 2008	}	500	From ICWSM'09	
	BROWN	American English corpu	s from 1961	1	http://en.wikipedia.org/wiki/Brown_Corpu	<u>s</u>
	BE06	British corpus from 2006	i	1	http://eprints.lancs.ac.uk/27206	
	AME06	American English corpu	s from 2006	1	http://eprints.lancs.ac.uk/27206	

Figure 2.10 Available Text Corpora on IntelliText

After choosing the appropriate corpus, the user is then led to the main KWIC page (*Figure 2.11* below). The default search tab at this stage is that of 'Concordance' in which usual and simple searches of words in context can be launched. However, it is on this tab where the user can set some important search preferences before moving to the 'Affixes' tab, such as the amount of context for each search and the number of concordance lines (10 is the default number), among others.

	Centre for Translat	ion Studies	IntelliText 2.6					
Home Page	Choose Language	Choose Corpora	Choose Type of Search	View Results	Build Your Own			
English BNC								
<ul> <li>Concorda</li> </ul>	ince							
Sea Display ea	Search for Type a quit rch for matches anywh ch match at the mid Display up to 10 Search	ery (CQP or CSAR) here ere in a sentence dle of a context of matches with	e or use the Search Builder 60 chara 15 r per p mimimum of 0	cters age Show tota	rch Builder			
<ul> <li>Collocation</li> </ul>	on							
<ul> <li>Affixes</li> </ul>								
→ Compare	Frequencies							

Figure 2.11 IntelliText Main Concordance Tab

By selecting or opening the 'Affix' tab, the user reaches the main search box for words with affixes (*Figure 2.12*). Two kinds of searches are possible: (1) the option to search for any base words with a certain prefix or suffix which would provide a full list of words that take the inserted affix in the box; (2) the option to search a base word with all possible derivations and inflections that it takes. In other words, this option would provide word family information on any (base) word the user decides to search.

In order to launch searches based on a certain affix the user wants to investigate, the first option is most appropriate. Firstly, the tick box by the option 'Search for any base words with' should be selected. An affix then is inserted in the search box (e.g. *anti-*). In cases when a hyphen is inserted with the affix the results would include only hyphenated words with affixes, whereas searches without a hyphen generate word lists containing both hyphenated and unhyphenated words with affixes. Lastly, the user has the option 'Highlight likely non-affixed forms' which is designed to distinguish between words that contain a certain affix (e.g. *para-* in *paramedic*) and those which do not (e.g. parasites in which the part 'para' does not represent the prefix *para-*). However, selecting this option, as it has been mentioned in the *IntelliText* 

*User Guide* itself, may prolong the results. This option may not be suitable for class activity in which time constraint is typically an issue.

	Centre for Translat	ion Studies	IntelliT	ext 2.6	
Home Page	Choose Language	Choose Corpora	Choose Type of Search	View Results	Build Your Own
English BNC					
→ Concorda	ance				
→ Collocati	on				
<ul> <li>ATTRES</li> <li>Search</li> <li>Search</li> <li>Search</li> </ul>	o for any base words with a for this base word is words with PoS matching a	nti- ● as Pre emma   with P nything   PoS Ed	efix as Suffix Highl refixes with Suffixes itor	ight likely non-affixed	forms
→ Compare	Frequencies				

Figure 2.12 IntelliText 'Affixes' Tab

*IntelliText* provide the results in a form of a frequency list of words with the searched affix starting from the most frequent ones (*Figure 2.13*, word list on the left). As we can notice in the figure below, an investigation of the prefix *anti*- shows that the word *anti-social* is the most frequent one with this prefix in BNC, occurring 190 times. The user is free to navigate the list further by selecting the numbers below the list. The bigger the number is selected the less frequent words are found in the list. The frequency list seem to be suitable for EFL learners as they are able to focus on some more frequent words rather than on some others with fewer occurrence in the corpus. In order to launch concordance lines from the list of words, simply a word is clicked after which a window pops up on the right side of the page (*Figure 2.13*, concordance lines for the word *anti-government* on the right).

Home Page	Choose Language	Choose	Corpora	Choose Type	e of Sea	rch View Results Build Your	Own		?
<pre> &lt;&lt; first</pre>	<prev 1="" 2="" 3="" 4="" 5<="" th=""><th><u>6 7 8</u></th><th><u>9 10</u></th><th>next &gt; last &gt;&gt;</th><th></th><th>Concordances</th><th>for [lemma="anti-govern</th><th>nment"]</th><th>00</th></prev>	<u>6 7 8</u>	<u>9 10</u>	next > last >>		Concordances	for [lemma="anti-govern	nment"]	00
Empty	Lemma	Forms	Count -	]	titleid	left	match	right	-
	anti-social	2	190		<u>A03</u>	armed opposition or non-violent	anti-government	activity. They are initially held	C
Parallel 1301e	anti-government	3	184		<u>A03</u>	Corporation and for " possession of	anti-government	literature ". The four prisoners	
Collocation	anti-Semitic	5	158		<u>A1F</u>	replaced to remove the evidence of	anti-government	messages. Others have been covered	ŧ I
Table	anti-aircraft	2	132		<u>A1W</u>	land reform, gave them a populist	anti-government	bent and managed to woo over many	000
Empty	anti-semitism	2	130		<u>A1W</u>	Mexicans looking simply to cast an	anti-government	vote supported the left, which	D+i2
Empty	anti-Semitism	1	116		<u>A28</u>	" pack of wild dogs " at an	anti-government	protest on 5 September in the	t
Affix Forms	anti-war	2	110		<u>A3W</u>	any action that could be seen as	anti-government	. Privately, a number of distinguished	Ű
	anti-drug	4	98		<u>A46</u>	parts of Somalia controlled by	anti-government	guerrillas. He describes a country	
Frequency Comparison	anti-racist	1	97		<u>A4N</u>	occasionally took an independent,	anti-government	line. Sustained advertising campaigns	
Table	anti-apartheid	4	96		<u>A66</u>	financing, partly over alleged	anti-government	reporting of such episodes as	44
Frequency Comparison	anti-communist	3	92		<u>A8K</u>	Dubcek, yesterday promised to meet	anti-government	protesters in Prague during the	-ir
Chart	anti-nuclear	1	83		<u>A9E</u>	and accusing them of inciting	anti-government	demonstrations, said one of the	1
KeywordsCond Table	anti-inflammatory	1	74		<u>A9M</u>	next evening he addressed a large	anti-government	rally in Bratislava and within	
Kananan da Tabl	anti-terrorist	3	74		<u>A9M</u>	since the bloody crackdown on	anti-government	protests in June. The admiral	
No y Martis Frank	anti-tank	2	70						-
<sup>KeywordsFreq</sup> << first	<pre>&lt; prev 1 2 3 4 5</pre>	<u>6</u> <u>7</u> <u>8</u>	<u>9 10</u>	l next > last >>					ation

Figure 2.13 IntelliText Results Page

At this phase, *IntelliText* provides some additional options for EFL learners to use. One useful feature is that of sorting the concordance lines. This can be done by using the 'Sort options' menu along with other options positioned vertically on the far right of the window. The sorting could be done alphabetically on the right or on the left side of the central word (i.e. anti-government). As it is known, sorting aims to identify useful frequent word patterning and collocational information of the word one investigates. Another useful feature is that of generating more context for any of the concordance lines displayed on the concordances window. This can be done by clicking one of the 'titleid' codes by the concordance lines. Additional context is provided to clarify a concordance line, word meaning or even specify the text genre for the learner. As it can be seen in *Figure 2.14* below, for each expansion of the text (e.g. an article), domain, genre, and so on.



Figure 2.14 IntelliText – extended context for concordance lines

To sum up, *IntelliText* seems to offer plenty of useful features for every learner who wants to explore and expand his or her vocabulary. This is especially the case with exploring words with affixes. As we saw, the corpus has been designed with the learner in mind and hence has been intended to be as much user-friendly as possible. What is more important is that the designers of the corpus claim *IntelliText* to boost vocabulary, although this is hard to confirm without empirical data. The current research aims to use *IntelliText* and its affix search features with the experimental group in exploring and expanding their vocabulary. The data to be gathered will reveal how learners feel about the corpus and its features as well as it is expected to show whether *IntelliText* leads to learning among language learners.

### 2.2.5 The application of corpora in language teaching and learning

With the advancement of computer corpora and the growing availability of computers to many in the society in the 80s and 90s, corpora were no more luxury tools only accessible to researchers and theorists for purely linguistic investigation, but also they became accessible tools to material developers, syllabus designers, teachers, and language learners. Thus, a new dimension of CL emerged, the educational branch of CL.

Hence CL and language teaching became an area of extensive research and discussion; the application of corpus and corpus data in the language classroom as a result has taken many forms. Leech (1997) usefully distinguished between direct and indirect use of corpora for language teaching and learning, a classification still commonly used today.

The indirect use of corpora, as the name itself suggests, includes the utilization of hands-on concordancing and corpus data for language material and syllabus design and it is typically done by researchers, lexicographers, material writers, and syllabus designers. The indirect use is therefore not always obvious in the language classroom and learners, and sometimes teachers as well, are not aware of the corpus-based materials they are using. Some of the language resources that are based on corpus findings include many contemporary English dictionaries, such as *Macmillan*, *Longman*, *Cambridge Dictionary* etc., and various well-known language and grammar textbooks (Francis, 1996; Biber, et al., 1999; Carter & McCarthy, 2006) which are widely used in teaching EFL.

The direct use of corpora, on the other hand, has to do with having teachers and language learners use concordancing themselves for language teaching and learning purposes. The direct application of corpora can be teacher directed, teacher and learner or only learner. That is, teachers can use corpus data as a teaching material, such as in a form of handouts, in the classroom; in other cases, students can be engaged in concordancing themselves while teachers can facilitate their corpus exploration and assist them in interpreting their findings; or it may include students using corpora autonomously inside or outside classroom to meet their needs, but this is normally done when learners have advanced skills in searching, finding, and interpreting corpus data.

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The present study aims to use the direct DDL technique, i.e. the direct application of corpora in which learners will be engaged in using hands-on concordancing for their learning while the teacher will have a role of a facilitator in the classroom.



Figure 2.15 Different applications of corpora in language education (Römer, 2008)

# 2.2.6 Data-driven Learning (DDL)

Data-driven learning (DDL) is a term coined by Tim Johns (1991) which he used to refer to his newly devised method to teaching and learning that included making students use computer concordance lines for language teaching and learning purposes. DDL is also known as 'discovery learning' (Baker, 2006, p. 54), a term consistent with Johns' famous slogan: "Every student a Sherlock Holmes" (1997, p. 101), which reflect the discovery nature of the approach. According to Johns (1991):

...the task of the learner is to "discover" the foreign language, and that the task of the language teacher is to provide a context in which the learner can develop strategies for discovery - strategies through which he or she can "learn how to learn" (p. 1).

Since the invention of DDL, theorists and researchers have used various definitions for the approach. McEnery & Hardie (2011), for instance, define DDL as:

A way of using corpora in language teaching that involves the learners being given direct access to the corpus and a tool for searching it, the intention being that their exploration of the corpus helps their learning of the language (p. 242).

Similarly, for Richards and Schmidt (2010) the term refers to a kind of "teaching that is informed by authentic real-life language use based on information derived from a corpus" (p. 155). Gilquin and Granger (2010), on the other hand, consider DDL as a method which includes "using the tools and techniques of corpus linguistics for pedagogical purposes" (p. 359).

DDL is different from the traditional teaching and learning in many ways. Flowerdew (2015) highlights three key elements that make the approach specific. Firstly, DDL doesn't consider lexis and grammar to be separate entities as in traditional practices but it promotes a more lexico-grammatical method. The language in corpus is natural as it was spoken by native speakers, thus it excludes any additions or made-up language and it is not made simpler to suit learners of different proficiency, although some contemporary corpora are graded for this purpose. And lastly, corpus consultation, as opposed to traditional learning resources, is more inductive, meaning rules are derived from corpus data through concordancing.

## 2.2.7 Historical perspective of DDL

In this section a brief history of DDL will be given focusing on some of the major events that contributed to direct application of corpus linguistics in language education. That includes the compilation of the first English electronic corpora which paved the way for the emergence Corpus Linguistics and then DDL itself; and major developments in corpora and language teaching, such as Sinclair's COBUILD project, Tim Johns' work as well as series of conferences on Teaching and Language Corpora (TaLC) which have increased interest in the field.

The first computer readable corpus to be compiled was the LOB corpus (1961) which contained one million words representing the British variety. In the same year, LOB corpus was used as a sample to compile the first American electronic corpus, the Brown corpus, which consisted of the same amount of text as LOB. Both these corpora played a key role to establishing CL and they were exclusive tools for researchers and lexicographers for quite some time and pure linguistic analysis was the main focus. However, it wasn't until the compilation of Bank of English corpus and COBUILD project lead by John Sinclair in 1980s when major advances were made in terms of using corpora for educational purposes. Sinclair and his team's work was focused to compile corpus-based dictionaries and teaching materials which carefully considered frequency and involved naturally occurring examples rather than made up ones. Thus, the COBUILD project was a major step towards the indirect use of corpora in language pedagogy.

Another major development in the use of corpus for teaching and learning purposes but this time in terms of direct use of corpora, i.e. direct DDL, is the work of Tim Jones. Inspired by Sinclair's work, he is regarded a pioneer in having language learners use corpora directly as a learning tool to analyze grammar and vocabulary. He was the one to coin the term Data-driven Learning (DDL) meaning that language learner shall be 'a research worker whose learning needs to be driven by access to linguistic data' (Johns, 1991, p. 2). His new approach has inspired many language researchers and language educators to conduct various studies using DDL method.

The first meeting which brought researchers and practitioners together to discuss corpora and DDL was the first conference on Teaching and Language Corpora (TaLC) which was held at the University of Lancaster in 1994. Since the first conference, the interest in direct and indirect use of corpora has been constantly growing. The conference has been organized almost annually and it has served theorists, practitioners as well as software developers to reflect on existing

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developments and practices of DDL and to reflect on future perspectives. TaLC 12 was the latest of series of conferences and it was organized by Justus Liebig University Giessen in 2016. In addition to these conferences, various volumes (Hunston, 2002; Bernardini, 2004; Sinclair, 2004; O'keeffe, McCarthy & Carter, 2007; Aijmer, 2009; Reppen, 2010; Flowerdew, 2011; Leńko-Szymańska & Boulton, 2015; Farr & Murray, 2016) have been published in the last two decades to report on theories, research and practices of DDL in addition to other areas of CL. But despite the extensive research, discussions and publications on DDL as well as its high potential in the language classroom, the approach has still not been integrated in the language classroom as it had been expected. We turn to discuss some reasons and obstacles in section *2.2.8* below.

## 2.2.8 Discussion on benefits and limitations of DDL

Corpus Linguistics theorists, researchers, and practitioners highlight numerous advantages of DDL in language learning. These benefits range from the resourcefulness of corpora and the flexibility of the corpus software to the tremendously useful mental and internal processes it triggers in the learner.

In DDL learners get to use naturally-occurring language, i.e. language used by native speakers in real situations, in their language learning process. Corpus software allows them to explore how language is used authentically as well as how it behaves naturally in different contexts, genres and styles. All this, in turn, leads to learners being "confident that they are learning the language they will encounter when they step outside the language classroom and into the world of language use" (Ruppen, 2010, preface).

DDL generally fosters useful mental processes and it is highly motivational to language learners. O'Sullivan (2007) refers to considerable skills that learners develop during corpus consultation process: Corpus consultation involves the following types of mental or cognitive skills: predicting, observing, noticing, thinking, reasoning, analysing, interpreting, reflecting, exploring, making inferences (inductively or deductively), focusing, guessing, comparing, differentiating, theorising, hypothesising, and verifying. These activities not only increase the mental activity of the learner, but also they help learners to develop their learning and cognitive processes. (p. 277)

According to Warren (2015), these particular skills, in addition to aiding language learning, are also beneficial to learners in their academic success and other situations beyond college. Furthermore, for Gilquin and Granger (2010), DDL can develop self-confidence as a result of language learners' feeling of empowerment they get through corpus consultation and discovery. The later, they hold, tend to increase motivation and satisfaction during language learning. The positive learners' attitude towards DDL has been also recorded in plentiful DDL studies (Boulton, 2010).

A corpus is a very efficient and a resourceful language tool. It can provide answers on linguistic issues at a click of a button, some of which would take plenty of time to find if they were to be investigated in traditional ways, would be hard to find in the language and grammar textbooks, and sometimes unlikely to get from a language teacher. And most importantly, as demonstrated with examples in section *2.2.2*, concordancing can support both teachers and learners in infinite language investigations. Ruppen (2010), for instance, provides various procedures and guidelines on how to investigate vocabulary, word patterning, collocation, and register by the help of hands-on corpus activities. Moreover, corpus investigation plays "a corrective function when learners compare their own language use with that of expert users in the corpus" (Gilquin and Granger 2010: 359). That is to say learners can refer and rely confidently to the corpus data whenever they have a doubt or question related to their foreign language structure and use.

Corpus consultation fosters learner autonomy. Corpus linguistics method is more inductive or 'research-then-theory' (Johns 1991: 30) approach. DDL requires learners to explore the corpus using varieties of queries in order to become aware of how language behaves and this is done more autonomously in contrast to traditional teaching and learning methods. In a typical DDL class a teacher plays a role of a facilitator while language learners are expected to become more autonomous, which involves "construct of capacity – attitudes and ability – that allows learners to take more responsibility for their own learning" (Benson 1997, p. 19 as cited in Lamb & Reinders, 2008). The fact that learner autonomy is a crucial component in DDL, it makes the approach broadly consistent with many contemporary language learning and teaching philosophies and approaches.

Apart from valuable benefits, DDL has certain limitations. Literature refers to some of its shortcomings which are worth considering when one decides to use corpora in the class for either regular teaching sessions or research. One obstacle in implementing DDL to which Gilquin and Granger (2010) draw our attention is the necessity for corpus training. Even with the significant improvements of corpus software, it is still evident that learners need sufficient training in order for DDL to be effective. The training includes both preparing students to use the software, e.g. to execute different queries, as well as training them how to interpret data since, as we pointed out earlier, corpus consists of raw data which is on teachers and learners to understand and interpret it. According to Gilquin and Granger, making learners use corpus without proper training may result in learners failing to do appropriate searches or may lead to unsuccessful interpretation of corpus data.

Another hurdle has to do with the difficulty level of the corpus text. The fact that corpora have been mainly used (be that for teaching or research) in university settings and rarely in other education levels (Flowerdew, 2012) partly proves this. Corpus text, such as the BNC text, is naturally-occurring and excludes any modification or simplification to suit all kinds of learners' levels. For this reason some researchers and theorists consider corpora to be more suitable for more advanced learners rather than beginners. The idea, for instance, is supported by Hunston

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(2002) who suggests DDL to be more useful for already advanced language learners "who are filling in gaps in their knowledge rather than laying down the foundations" (p. 171). This view, however, has not remained unchallenged considering opposing views arguing that this is not always the case. Gilquin and Granger (2010), for example, rightly maintain that whether the level of the corpus is difficult or easy for a particular group of learners depends on the task they are given to finish. That is to say learners of lower levels should be engaged in easy corpus queries that will give them basic insights about the target language grammar and use. More advanced learners, on the other hand, may carry out such corpus searches that will make it possible for them to infer more advanced language insights. Thus, both basic and advanced language investigations can be conducted through the very same corpus.

DDL is an inductive approach which requires more autonomous learning. Language learners are expected to be the language investigators themselves getting only limited assistance from their teachers. They are required to utilize concordance lines to find answers, draw conclusions, and make generalizations on various linguistic issues. Although this seems as a perfect methodology at first, corpus inductive tasks are still seen as very challenging and not suitable for every language learner (Flowerdew, 2012; Leńko-Szymańska & Boulton, 2015) given the various learning styles they prefer to use. Considering that many educational institutions have tended to incorporate more deductive approaches for many years, especially in the developing countries, it would be a radical step to shift away from traditional teaching approach (i.e. deductive) towards a purely inductive one. For this reason, DDL has been reviewed and a softer DDL version has been proposed to accommodate different learning styles of language learners (Flowerdew, 2008). We discuss DDL and its inductive nature in more detail in the next section.

The current impediments in the practice of DDL discussed in this section require consideration if practiced in the language classroom. However, these disadvantages are still far from eclipsing the current importance and the promising future of the approach. Corpora have a lot to offer to language learner both in linguistic and extra-linguistic terms.

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#### 2.2.9 Inductive vs. deductive approaches to teaching and learning

One important dichotomy that has been discussed extensively in corpus-driven language learning and teaching is that of deductive and inductive approaches to learning. The first is also commonly known as a top-down approach while the latter is typically identified as opposed to deduction, i.e. a bottom-up approach. Here's how Brown (2007) defines deductive and inductive reasoning:

Inductive and deductive reasoning are two polar aspects of the generalization process. In the case of inductive reasoning, one stores a number of specific instances and induces a general law or rule or conclusion that governs or subsumes the specific instances. Deductive reasoning is a movement from a generalization to specific instances: specific subsumed facts are inferred or deduced from a general principle. (p. 102)

Put simply, in deductive methodology one uses a general rule before moving to specific examples as it is the case in the typical traditional teaching and learning environments. In the inductive approach, on the other hand, one moves in the opposite direction, he starts from examples and then moves to make generalizations and infer rules.

Data-driven Learning, as the name itself suggests, is prominent for its inductive nature. This is how it was observed by pioneers of the approach, such as Tim Johns. DDL and corpus-driven methodology considers corpus evidence and corpus examples as a starting point. The data and the corpus results are then used to make generalizations about language and language use. Since DDL is seen as a discovery learning, a learner engaged in corpus tasks is considered a kind of 'language detective' (Johns 1997, p. 101) or 'learner as researcher' (Bernardini, 2004, p.16) who is expected to initiate corpus queries in a corpus, analyze and interpret the data from corpus, and finally make valuable generalizations based on the same corpus evidence and this is all done with little or no assistance from his teacher. The observations and the generalizations learners make about language through corpora, however, are not seen as typical rule learning. According to Hadley (2002), for instance, DDL tends to promote "consciousness raising activities" instead of having students learn rules; that is to say the approach doesn't treat learners to be "recipients of knowledge, but as researchers studying the regularity of the language" (p. 107). Similarly, Beatty (2010) points out that 'learners naturally internalize' rules and patterning of a language through corpus consultations rather than learn them, and that DDL "can stimulate learners' interest in language and give them a sense of empowerment and responsibility for their own language education" (p. 68). Egbert et al. (2015) holds that the approach helps the learner "develop a greater depth of understanding about forms…and increased noticing" (p. 123).

While the deductive approach is consistent with the traditional three P's (Presentation-Practice-Production) strategy, the inductive approach is more compatible with the three I's, i.e. Illustration – Interaction - Induction, to language learning (McEnery & Xiao, 2011). Carter & McCarthy (1995, as cited in McEnery & Xiao, 2011) were the first to encourage these stages of corpus-driven teaching and learning. These stages typically mean as follows:

- Illustration means looking at concordance lines and corpus data for linguistic evidence and insights
- Interaction means sharing the corpus observations and findings, e.g. with peers or teacher
- Induction means inferring rules or making generalizations about linguistic features

The separation deduction vs. induction and PPP vs. III in corpus-driven teaching and learning may appear to be a very strict one, but in fact it is not always the case. For example, Flowerdew (2008) maintains that the approaches 'could be seen on a cline' (p. 138) rather than in strong opposition. In the same way, Waren (2015) suggests that DDL approach can be adapted anywhere between fully teacher-centered and learner-centered scale. This means that DDL has a great degree of flexibility when it comes to meeting learners' various learning styles. The main reason why theorists and practitioners have carefully looked at this issue is because a pure inductive methodology may be too hard for at least some language learners. Flowerdew (2009),

for instance, reports on difficulties some learners had with reading concordance lines without their teacher's support. He points out that corpus results may be difficult for learners to interpret, especially when dealing with difficult corpus tasks, such as interpreting phraseologies. As we pointed out earlier, some learners who are used to purely deductive teaching and learning may find radical (deductive to inductive) method shift frustrating and difficult. In addition, some language learners simply dislike purely inductive pedagogy (Meunier 2002, cited in Flowerdew, 2008). What is clear from these arguments is the fact that a pure inductive DDL may not be appropriate for all learners and a softer version of DDL may be necessary to fill this gap.

Based on various research and class observations, theorists and practitioners have introduced answers to the limitations of typical inductive DDL. Meunier (2002, cited in Flowerdew, 2008), discussing some language learners' dislike of inductive learning, advocates a blend of inductive - deductive methodology to meet all learners' preferences. Boulton (2010) argues that a balanced approach should be used giving the teacher more role especially in the initial phases of DDL unless learners have proven to have no problem working inductively using concordance lines independently. Likewise, Flowerdew (2009) advocates a softer version of DDL especially when learners engage in difficult corpus enquiries. He suggests students should be given clues (e.g. these could be in form of questions) in highly demanding corpus tasks. Flowerdew goes on to recommend "a '4 Is' formulation, adding 'Intervention' as an optional stage between Interaction and Induction" (p. 407) to implement the idea of giving learners useful clues before inferring rules in the induction stage. However, he rightly claims that assisting learners with prompts are sometimes unnecessary, particularly in cases when corpus evidence is clear and there is no room for confusion in interpreting data. What we understand from this discussion is that corpus sessions should undergo a pedagogic review before taking place in order to anticipate possible problems, especially with learners trying to interpret concordance lines and corpus results. Hints and teacher support could be provided whenever necessary, depending on the learners' capacities as well as the level of difficulty of the task given.

### 2.2.10 Theoretical background for DDL

According to Hubbard and Levy (2016), Computer-assisted language learning (CALL – using a computer for language learning purposes) has never witnessed its own theory which would be exclusively designed for CALL pedagogy and research, but rather it has tended to be "largely a consumer of theories from other sources" (p. 25). There are vast array of theories that have informed CALL throughout its history but the most dominant ones Hubbard and Levy highlight are: constructivism, interaction account and sociocultural theory. In this section we focus on only two of these, i.e. the sociocultural theory and constructivism, as they are theories that normally inform DDL pedagogy and research. In addition, we will include the theory of 'noticing' which is another significant, if not the most significant, theory informing corpus-driven pedagogy and research (Flowerdew, 2015). As in many other CALL endeavors, DDL is informed by several theories rather than a single one. This is becoming common in CALL and it is known as 'theory ensemble' which refers to using "multiple theories within a single study to capture a range of perspectives that a single theory cannot" (Hubbard & Levy, 2016, p. 27). According to Flowerdew (2015), learning theories that inform DDL have been rarely discussed in the DDL research and literature and the main reason behind this is that DDL studies have mostly focused on using corpora as reference tools (as we do with dictionaries) rather than learning tools, as the present study aims to use them.

The noticing hypothesis in SLA states that "learners' acquisition of linguistic input is more likely to increase if their attention is consciously drawn to linguistic features" (Flowerdew, 2015, p. 16). Similarly, for Richards & Schmidt (2010) the notion refers to the cognitive process in which "input does not become intake for language learning unless it is noticed, that is, consciously registered" (p. 401). Flowerdew holds that noticing is vital to DDL tasks since learners completely rely on it when performing inductive learning. However, he distinguishes between learner-led and teacher-led tasks in which noticing takes place. The former involves a purely inductive approach in which learners solely depend on corpus data to notice certain language
features. The latter means learners are aided by teachers in the noticing process. Flowerdew refers to this as 'pedagogic mediation' (p. 20) and it resembles the potential of corpus tasks to be carried out on a scale ranging from teacher-led to student-led discussed in the previous section. In other words, it is on the language instructor to decide whether to aid or not his students during the noticing process of certain language features in the corpus.

By viewing the present study from the perspective of the noticing paradigm, it is reasonable to hypothesize that learners will be able to notice the foreseen language features selected for research. By searching corpora for certain words that have common affixation and by exploring concordance lines for morphological and meaning clues, learners are expected to notice that certain words share common patterns, i.e. common prefix or suffix as well as a common meaning, and that meaning could be easily derived from the affix used. This in turn is expected to contribute to intake as suggested by the noticing hypothesis.

Constructivism, pioneered and developed by prominent theorists and psychologists, such as Jean Piaget, Albert Bandura, Lev Vygotsky and so on, has informed many CALL endeavors in general but it has also served as a basis for DDL pedagogy and studies in particular (Flowerdew, 2015). There are various definitions and descriptions of what constructivism in education entails. Slavin (2018) provides a comprehensive description of learning through constructivist principles:

One of the most important principles of educational psychology is that teachers cannot simply give students knowledge. Students must construct knowledge in their own minds. You can facilitate this process by teaching in ways that make information meaningful and relevant to students, by giving students opportunities to discover or apply ideas themselves, and by teaching students to be aware of and consciously use their own strategies for learning (p. 188).

To put it simply, the constructive paradigm "views acquisition of knowledge as a dynamic process, with learners in the driving seat" (Flowerdew, 2015, p. 18) and that teachers'

knowledge cannot be transferred to learners but instead it should be 'constructed' by learners (Slavin, 2018). Flowerdew points out that learning by discovery promoted by constructivist learning paradigm entails complex mental processes like problem solving, extrapolation, and making hypotheses. This is fully consistent with the DDL method considering that corpus-based endeavors are expected to be inductive as initially advocated by the pioneers of the approach, such as Tim Johns. However, Flowerdew, similar to the strong version or purely inductive DDL discussed earlier in this chapter, questions the efficacy of the constructivist approach in its purest form maintaining that it may not be appropriate for every language learner, e.g. those who are not used to inductive learning approach. This nevertheless cannot diminish the importance and the applicability of the constructive paradigm in DDL. Firstly, there is a possibility to integrate 'scaffolding' in the mainstream constructivist endeavors (Kirschner et al., 2006, as cited in Flowerdew, 2015) in order to meet all learners' learning styles. Secondly, constructivist approach is not necessarily unsuitable in all learning environments. For instance Boulton (2010) maintains that learners should be given the opportunity to apply the inductive approach in DDL if they manage to handle this type of learning.

The sociocultural paradigm is seen as another theory underpinning corpus-driven research and pedagogy. Founded by the well-known Russian psychologist, Lev Semenovich Vygotsky, the theory highlights "the social environment as a facilitator of development and learning (Schunk, 2012, p. 240). According to this paradigm, learning does not take place in isolation but rather it is "co-constructed through collaborative dialogue and negotiation with guidance and support mediated by the teacher or student in the form of scaffolding" (Flowerdew, 2015, p. 19). Scaffolding proposed in the sociocultural paradigm clearly resembles the guided DDL or the softer version of DDL discussed earlier in this chapter. An additional key issue in the sociocultural theory and which is also significant to DDL is that of 'learner agency' which refers to learners' ability "to make choices and take responsibility for their decisions and actions" (Richards & Schmidt 2010, p. 18). Flowerdew, citing O'Keeffe et al. (2007), argues that agency is fostered through DDL. O'Keeffe et al. claim that learners' agency entails the ability of learners, through corpora training, to become autonomous and efficient in handling new lexis. In order

to demonstrate the significance of learner's agency in DDL, Flowerdew also refers to Cobb's study (1999). The results of Cobb's research indicated that his learners were successful in vocabulary expansion through DDL and learner-led learning. We turn to discuss Cobb's study in more detail latter in this chapter.

It is evident from the discussion in this section that DDL can be informed by various learning theories which are not developed specifically for corpus-driven practice but they also serve as theoretical foundations for other CALL and learning methods in language pedagogy. According to Flowerdew, the applicability and the effectiveness of theories underpinning DDL reviewed in this section still lack sufficient evidence. The full potential of corpora as learning tools is still unclear and more light is expected to be shed as new evidence emerges from new studies in the field.

#### 2.2.11 DDL and vocabulary learning

One of the main well-known features of corpora in language investigation is their capacity to provide word exploration and word analysis, be that in isolation or in phraseology. Theorist and practitioners have pointed to numerous benefits and advantages of using DDL in vocabulary investigation and learning. As a result, vocabulary learning through corpus consultations has drawn the attention of researchers and has led to more extensive research in the field in the last few decades.

There are numerous ways corpora and corpus consultation can benefit language learners when it comes to vocabulary learning and development. Wilson (2013) and Gilquin & Granger (2010), point out that language learners can use corpus in their vocabulary expansion. This can be done in many ways, either through explicit or implicit learning. The central idea is that in corpus activities learners are constantly exposed to concordance lines and this, in turn, can lead to "focused repetitions of the target word, as learners are offered the opportunity to go through a number of examples in a short time, which may take years for them to meet via conventional reading" (Quan, 2016, p. 277). The concordance lines are typically reduced and provide numerous examples for words which cannot be found in traditional resources, such as textbooks or grammar books.

One strong advantage of corpora is that they provide authentic and rich contexts for words. Standardized corpora, such as *BNC*, are comprised of texts that represent authentic language which is spoken or written by native language speakers of English. Nation (2000) holds that language learners are typically exposed to genuine language situations when learning vocabulary through corpus consultation and this guarantees different linguistic evidence for words compared to other non-corpus contexts. For Quan (2016), having language learners use concordance lines can help them improve their understanding of how a particular word is used in real-life events and situations. In addition to these, corpora provide specific information on contexts that may be useful to learners. These include information on whether a word is mostly used in written language, spoken, or both; if the word is academic or general, and so on. These important clues about words are exclusively available for learners in the modern-day corpora which are often hard to find elsewhere, such as in contemporary dictionaries or textbooks.

Nowadays word frequency has become a crucial aspect in vocabulary acquisition. It is reasonable to have second or foreign language learners learn or master those words which are more frequent in the target language rather than those which are not as common. When vocabulary textbooks are devised today, corpora are consulted for word frequencies in order to prioritize some words over some others. This prioritization can be also done directly by the learners if we engage them in corpus-based tasks and activities. All corpora have an in-built frequency feature which learners can use to create their list of words according to the frequency of appearance in the corpus. According to Thombury (2002), frequency word lists generated by corpora are seen as very beneficial to language learners. There a few types of word lists that can be generated by a concordancer and this depends on the corpus interface we are using and the type of word list we need to generate. For instance, *IntelliText 2.6* can

generate frequency word lists based on the prefix or suffix students want to investigate. An investigation of the suffix *hood* in *IntelliText* using *BNC*, for example, one finds that the words *childhood*, *motherhood*, and *adulthood* are the most frequent ones that contain this prefix according to the corpus results. On the other hand, words such as *cousinhood* or *warriorhood* are very rare in the corpus. Based on this finding through frequency lists in the corpus, it is reasonable for a learner to focus or prioritize the learning of the former before the later ones. These frequency lists, as a result, may help learners focus on words they will most likely encounter rather than wasting time and energy on those which they may never come across during their lives.

In the discussion so far we have discussed only some of the ways corpus consultation can contribute to vocabulary investigations, expansion, and learning among EFL learners. Additional benefits and a more comprehensive list of information one can extract from a corpus for words is also provided by McCarten (2007). According to her, one can extract the following information from a concordancer:

- "Frequency: Which words and expressions are most frequent and which are rare
- **Differences in speaking and writing:** Which vocabulary is more often spoken and which is more often written
- Contexts of use: The situations in which people use certain vocabulary
- Collocation: Which words are often used together
- Grammatical patterns: How words and grammar combine to form patterns
- Strategic use of vocabulary: Which words and expressions are used to organize and manage discourse". (p. 3)

With all these great features of corpora and various opportunities available in using them, there are two considerations that should be taken into account. Firstly, corpus consultation by itself does not necessarily mean successful vocabulary learning. Consulting a corpus is only a mere

reference to authentic data and this does not guarantee learning. As McCarten (2007) rightly put it:

The Corpus...cannot tell us exactly what to teach or how to teach, and it has nothing to tell us with respect to how students learn best. It cannot replace the expertise of teachers, or of students themselves, on how best to teach and learn vocabulary. It is *a* tool. It is not the *only* tool. (p. 3)

Based on this idea, corpora, no matter if we consider them as reference or learning tools, should be supplemented with pedagogy if we want to take advantage of them in language education. Secondly, learning with the help of corpora should not be viewed as a substitute to traditional teaching approaches and methods, but instead, as complementary one (Wilson, 2013). Therefore, teaching and learning of vocabulary through DDL may be combined with traditional pedagogic practices to further enrich the language classroom with new and innovative tools and methodologies.

## 2.2.12 Similar Studies

There are several similar studies which have been conducted in the area of DDL and vocabulary learning. In this section two studies are discussed in more detail. The first one is Tom Cobb's (1999) research with a group of university students and another is a study conducted by Enes Yılmaz and Adem Soruç (2015) with a group of Turkish language learners.

Cobb's study was conducted in one of universities in Oman and it included a group of university students. His main focus of investigation was enhancing the participants' vocabulary with the help of a computer program which included both word definitions and concordance lines. The major inspiration behind his research was his English university courses in which students were required to learn a vast number of new academic words in a very limited time period (in two semesters) in order to prepare for instructions during their academic studies.

Cobb discusses two issues in relation to the challenge of boosting academic vocabulary proficiency: the time limitations in academic settings and the breadth vs. depth dichotomy. The first issue had to do with time constraint which university students' faced when it came to boosting academic vocabulary. The problem was twofold at this point: one was that the number of new academic vocabulary that students had to learn was large; and secondly, these university students had very limited time to master them. The issue of time becomes even more complex when it comes to the breadth and depth dichotomy of vocabulary knowledge. According to Cobb, this is particularly problematic in developing countries in which English is learnt as a foreign language for the purpose of studying at university and that traditional approaches to adopting between the former or the later have not given results. Word-lists, which contribute to the breadth of vocabulary knowledge, are usually seen as solutions to the time limits in vocabulary learning. Cobb, however, argues that even though word lists seem promising in terms of time efficiency, they can provide only 'superficial knowledge' (p. 345) and cannot guarantee effective reading or further vocabulary building. Developing depth of vocabulary, on the other hand, requires extensive reading and sufficient exposure time to the vocabulary which university students don't typically have. According to Cobb, one possible solution to the breadth and depth issue in vocabulary learning may be in the balance between word-lists and word contexts and this could be managed with the new opportunities offered by the new technology.

Based on this essential idea, a special corpus interface with special text as a corpus was designed for the university learners. Initially, the materials that were planned for the students to read during the two first semesters were inputted into a computer to be later used as a text corpus by the new interface. Designed to be user-friendly, the interface, which was named *PET 2000*, included a list of most commonly used English words. By selecting one of these words (i.e. the unknown word) in this program, students were provided concordance lines for the word selected found in the academic materials corpus. In addition, the selected words were saved in a disk in order for the students to review them later on, but in an elegant printed

version. The printed version, on the other hand, had lists of all the selected unknown words, their definition and an example sentence extracted from the corpus for each word in the list. In short, the software was a special kind of dictionary, with a built-in concordancer, which was designed to be further developed by the students themselves by adding new words and examples from the concordance lines.

Cobb's study included two groups of first year university students from which one was experimental while the other was a control group. The experimental group participants were given the opportunity to use *PET 2000* as a vocabulary learning tool, whereas the control group used word lists and a dictionary as a reference tool for definitions for their newly introduced vocabulary. All the participants of both groups were asked to learn two hundred words weekly for approximately three months. During this particular period of time many quizzes, both prior to learning and after learning, were done to test preliminary knowledge and post-learning gains. The quizzes were designed to test the participants' vocabulary knowledge in terms of recalling definitions as well as their ability to use the newly learned words in new contexts. In addition, the study included delayed tests which aimed to check the participants' long-term retention of the vocabulary.

Cobb's research showed relatively mixed results. Both the experimental group and the control group had significant gains when it comes to recalling definitions for the new words. However, differences were identified when it comes using the newly learned words in new contexts. Namely, the control group didn't do very well in using the new vocabulary in new contexts as opposed to the experimental group which managed to do so quite successfully. The delayed tests on definitional knowledge also marked retention differences between the groups. The experimental group's test figures not only indicated successful retention but also marked further gains. On the contrary, the control group did not manage to retain the same as in the case with the experimental group.

To sum up, Cobb's research indicates that a combination of word lists and concordance lines may be a solution to the breadth vs. depth problem. Namely, the statistics clearly show that the experimental group outscored the control group both in word retention and using the new words in new contexts. Furthermore, figures point to the fact that a more constructivist approach to vocabulary learning by having learners more involved in learning new words with the help of concordance lines leads to better results compared to traditional practices.

In their article "The use of Concordance for teaching Vocabulary: A data-driven learning approach" (2015), Enes Yılmaz and Adem Soruç report on their research they conducted in the area of corpus-based vocabulary learning. The study included a group of Turkish students who were learning English language in a private language institution in Turkey. The participants were all teenagers and had a pre-intermediate language proficiency. For the purpose of the study, the group was split into an experimental group and a control group.

A pretest, posttest, and interviews were used as instruments to collect the data for the study. In the beginning, a pretest was administered to test the students' knowledge of the vocabulary planned to be taught during the course of the study. The pretest helped to identify the words that students already knew and thus were excluded from the study instructions afterwards. Once unknown words to the participants were identified, they were planned and taught to both the experimental and control groups. There were eight sessions of instructions in which the experimental group learned the new vocabulary through technology whereas the control group was taught through a more traditional paradigm. Namely, the experimental group, after a brief training in corpus use, used the online *Corpus of Contemporary American English* to learn the newly introduced words in a more inductive way, that is, by inferring meanings and looking at concordance lines for each word. In contrast, the control group was provided with the meanings of the words, synonymous words, and native language equivalents in order to clarify the newly introduced vocabulary. In addition to this, they were also given some exercises in the end to revise the words. Upon finishing with the treatment sessions, all groups were administered a posttest to assess the participants' vocabulary gains. In the end, several participants from the experimental group were chosen for interview. The interview was designed to collect qualitative data and it was aimed to draw insights into the participants' attitudes and perceptions of learning new words with the help of concordance lines and the corpus.

The results from Yilmaz and Soruç's study indicated that both the experimental and control groups had significant vocabulary gains. The experimental group, however, performed significantly better in recognizing the words compared to the control group, showing that concordance lines had better learning effects than ready-made definitions and exercises among the participants. The analysis of the interviews showed that the experimental group participants had positive attitudes towards using concordance lines and COCA by pointing out that multiple contexts for words in the corpus had helped them remember the words better.

This study provides important insights as to how corpora can help learners in more effective vocabulary learning. However, as the authors point out themselves, the study does not go beyond mere recognition of words which is only superficial knowledge of vocabulary. It can nevertheless provide a good basis for further research which will explore other aspects of vocabulary learning with the help of modern-day corpora.

## 3. RESEARCH DESING AND METHODOLOGY

### 3.1 Introduction

In this chapter a detailed methodology of the study is given. Firstly, we discuss the pilot study the main aim of which was to test the technique and the instruments foreseen for the main study and has hence contributed to a more reliable final research design. Then, we move on to discuss participants, materials, procedure, and the research design that was applied throughout the research. Finally, a comprehensive description of all data analysis is provided at the end of the chapter.

### 3.2. The Pilot Study

The aim of the pilot study was threefold. Firstly, it served to test researcher's corpus-driven approach in a classroom setting. The pilot study sessions were carefully observed to identify any possible obstacles emerging from utilizing corpora for language investigation with language learners as well as to avoid the same when the main research takes place. Secondly, it aimed to explore learners' attitudes towards using corpora as reference tools. As we explained earlier, a difference is made between using corpora as reference tools (similar to using dictionaries) and using corpora as learning tools (Gilquin and Granger, 2010), and the piloting was mostly focused on the former. It was intended to confirm that learners have positive perceptions of corpora as linguistic tools before proceeding with the main study in which corpora will be used as learning tools. Thirdly, the piloting aimed to test the validity of some of the instruments foreseen for the main study. These instruments included: a smaller version of the questionnaire (compared to the one foreseen for the main study) and a self-reflection paper.

#### 3.2.1 Procedures and instruments

The pilot study included eleven participants, nine of which were 2<sup>nd</sup> year students and two 4<sup>th</sup> year students, all of which were from the department of English Language Teaching at International Balkan University. The selection was random, that is, no selection was made in terms of language proficiency, gender, or any other criteria. All the participants had no previous knowledge of corpora as language tools and it was their first experience of using the technology through hands-on activities. The overall study was conducted in two days, one session in each. The sessions lasted about an hour each.

In the first session, students were initially presented with corpus as a linguistic tool as well as with some of its basic features. Afterwards, they were given the opportunity to search for words of their preferences and they experimented with sorting of words on the left and on the right in order to look for typical patterns and collocations around each word. They used *Skylight*, an online corpus, for this purpose. After it was observed that students were comfortable with doing simple searches in the corpus, a hands-on activity followed. More precisely, they were given an essay with some deliberate errors (grammar, patterning and collocation) which they were asked to correct by using the corpus as a helping tool. Lastly, the researcher offered instructions on how corpora can be utilized to do advanced searches. Corpus of Contemporary American English (COCA) was used to illustrate a chart view of some words in a historical perspective as well as in terms of language genre they belonged. All in all, the primary objective of the first session was to make students aware of corpora and their capabilities as linguistic tools as well as have them use concordance lines (with little training) in a task, i.e. essay error correction.

In the second session, the group was presented with another online corpus interface, *IntelliText*, administered by University of Leeds. The reason for using this particular corpus in this part of the piloting was connected with the type of hands-on activity the students were required to undergo, that is, searching words based on their affixes, i.e. prefixes and suffixes, as

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this particular corpus is more practical for this particular purpose. Firstly, the participants were guided with the basic features of the corpus and the procedures needed to search and find words with a particular affix. Afterwards, the students were given a task in which they were required to search and find words with a certain affix given by the instructor. To make the task easier, the instructor provided the general meanings of the affix. The students, thus, were asked to find different words with that particular affix as well as find the meaning of each word when combined with that affix by looking at concordance lines for clues. In some cases they were also asked to use the concordance lines as a help to find the grammatical class of the word. The participants used a digital note-taking application to record the findings. In this session the focus was more on testing the approach foreseen for the main study. In addition, the purpose was to test how students would do with handling the corpus tool to find words with affixes and their meanings.

The piloting procedure was finalized with participants completing the questionnaire and writing the self-reflection paper. The questionnaire was comprised of ten questions: three rating scale questions (in a range from *very easy* to *very hard*) and seven Likert scale questions. The former were devised to measure the difficulty of using corpora and the level of difficulty in completing the tasks. The rest of Likert scale questions were generally designed to explore students' perception and attitudes towards corpora and the usefulness of concordance lines in completing the above mentioned tasks; and to investigate whether they needed more instructor support during such corpus-based activities considering the fact that they received very little training in corpus use and reading concordance lines. The self-reflection paper was designed to have students reflect on their corpus use experiences, that is, their thoughts on corpora as tools to investigate language; their opinions on the corpus-driven method; and their thoughts on whether they see corpora as suitable tools for language classrooms.

### 3.2.2 The results of the pilot study

In this section, results from the pilot study will be presented based on the instructor's class observation, the questionnaire, and the self-reflection paper. Due to limited space of this section, only the most significant results will be discussed.

Based on the instructor's class observation, it was noticed that participants in the study performed well in the essay error correction task. Some of the students asked instructor's support when they had no results in the corpus due to misspelled words in the KWIC or because of incorrect search technique. However, the same improved and got more autonomous in error correction as the activity proceeded. Similarly, the participants performed relatively well with the second task – using corpus to find words with affixes – during the second session. In contrast to this general impression, however, it was also observed that some students struggled with the task. This was also noticed in their electronic notes where they were required to record their search findings. The notes indicated that they performed poorly in this particular task. As a result, these cases require consideration when the approach is used in the main study.

The questionnaire reveals mixed results in terms of how participants perceive corpora and corpus activities. When asked to rate the difficulty of using corpora (*Skylight & IntelliText*) as tools, all of the participants responded that corpora interface was either easy (72%) or very easy (27%) to use (*Chart 3.1*).



Chart 3.1 Participants' thoughts on the level of difficulty of using corpus interfaces (Skylight and IntelliText)

In line with the class observation discussed earlier, not all the participants find analyzing words with affixes using a corpus an easy task. The questionnaire indicates that the majority of them find it medium difficult, but that is not to say that they consider it as a very hard task (*Chart 3.2*).



Chart 3.2 Participants' thoughts on the level of difficulty of analyzing words with affixes with the help of corpora

The responses from the questionnaire indicate that participants were not fully confident with conducting language investigations with corpora (*Chart 3.3*), although, as pointed out earlier, they more or less succeeded in completing the tasks given to them. Nearly half of them agree with the fact that they need more training in order to do language investigations with a corpus. The rest of the respondents were uncertain of this, except one of them who felt he didn't need more training.



Chart 3.3 Students' responses on whether they felt they needed more corpus training for more successful language investigation

Similarly, when asked about whether they need more support from the instructor in doing corpus-based tasks, most of the respondents agreed except one who was uncertain and another who disagreed with this statement (*Chart 3.4*).



*Chart 3.4 Participants' opinions on the need for more instructor support while engaging in corpus investigations* 

In spite of some difficulties with corpus-based tasks, the participants see corpora as a valuable tool when it comes to exploring words with affixes, although learning was not part of the piloting. Nearly all of them (81%) strongly agree with the fact that corpus is a useful tool to learn new words with affixes. The rest of the respondents (18%) agreed with this statement (*Chart 3.5*).



Chart 3.5 Students' responses on the usefulness of corpora to investigate words with affixes

# 3.2.3 Results of self-reflection papers

The self-reflection papers (see a sample of self-reflection paper in *Appendix E*) indicate that all participants, with no exception, have positive attitudes towards corpora and their use in language investigation. Two participants noticeably expressed their astonishments with what corpora are capable of doing. For one participant, for instance, corpus is "a revolutionary invention". For another, it was a surprise for her to discover that a tool like this had existed. Two participants admitted that they had difficulties in coping with the tasks, but adding that they succeeded in completing them with the help of the instructor. The papers also indicate that all the participants had a positive view on the usefulness of concordance lines to correct errors and investigate vocabulary. One student, for example, wrote: "Corpus is a very user-friendly tool in expanding vocabulary, correcting errors, and learning English in general". Only some of them expressed their opinions on the method, by showing positive attitudes towards the approach but by emphasizing the instructors' help as a valuable component. The

participants also showed positive opinions concerning the incorporation of corpora in language classroom. For most of them, corpora should be available to every English learner.

#### 3.2.4 Discussion and conclusion

The pilot study clearly shows that students perceive corpora as suitable tools for classroom and valuable resources in linguistic enquiries. The same could be said for the corpus-driven approach as the participants gave the impression, based on both the class observation and the self-reflection papers, that they liked the sessions. This lays the foundation for the main study in which corpus is foreseen to be utilized for vocabulary learning purposes. Piloting also clarified some issues which should be taken into consideration when conducting the main study:

- Although results from the questionnaire given in *Chart 3.1, 3.2*, and *3.3* seem contradictory at first, they make sense when considering the fact that corpus tasks required two skills: one was managing the software searches and the second one was interpreting the concordance lines or corpus data. It is obvious that participants managed to use the software easily (*Chart 3.1*), but struggled to interpret data (*Chart 3.2 & 3.3*) as this was also obvious during the class observation. Based on these results, it is evident that learners need more training in corpus use, especially in interpreting data correctly. This also indicates that these particular questions in the questionnaire need a review and should be clearer and more specific if used in the main study.

- The questionnaire results (*Chart 3.4*) confirm the fact that a purely inductive approach discussed earlier in the literature review may be too difficult for the learners to cope with. In the second session of the study, participants were mostly left on their own to do the tasks. Both their responses and insights from class observation indicate that learners need more help when conducting such tasks. In other words, a more balanced DDL is required in which the instructor has more role, especially in the initial phases of DDL (Boulton, 2010) or DDL should be in a way 'guided' (Huang, 2008) to suit every learner in the class. It is, therefore, vital to review the approach and decide on what can be done to make it more suitable for the main study.

- Apart from the intervention that should be made in the questionnaire mentioned earlier, the rest of the instruments used in this study proved to be appropriate for the participants and thus could be used for the main study.

In conclusion, it is important to point out that this pilot study has paved the way for the main study in a way that it has tested the approach and the main instruments. Insights from the class observation and the questionnaire as well as the useful feedback from the study participants have all contributed to a more reliable and final research design for the main study.

## 3.3 Participants

The participants in this study were all university students who were majoring in English Language and Literature in the academic year 2017/2018 in Macedonia. More specifically, the participants were undergraduate students from two English Language Departments of two private universities: (1) the Department of English Language and Literature at South East European University (SEEU) and (2) the Department of English Language Teaching at International Balkan University (IBU). Thus, this study was focused on students from private universities and no participant was part of any of the state-run universities in the country.

The experimental group consisted of thirty students in the 18-21 age range. Twenty students in this group were 1<sup>st</sup> year students from the Department of English Language Teaching at IBU whereas the remaining ten students were 3<sup>rd</sup> year students from the Department of English Language and Literature at SEEU. The overall experimental group was comprised of twenty three females and seven male students, while in terms of nationality the vast majority in this group were Albanian students while two students were Turkish and another two were Macedonians.

The control group, on the other hand, consisted of twenty eight students, from which sixteen students were 2<sup>nd</sup> year students from the Department of English Language Teaching at IBU whereas the remaining twelve students were 1<sup>st</sup> year students enrolled in the Department of English Language and Literature at SEEU. The group, in the 18-20 age range, consisted of fifteen females and thirteen males, and in terms of nationality, the vast majority in this group were Albanian students while two students were Turkish and only one Macedonian.

The instructor during this study was the researcher himself. The researcher administered all the procedures in the study and had no other individual, be that a researcher, instructor or trainer involved. Namely, he administered the Quick Placement Test; trained the experimental group in corpus use; administered all the study tests, i.e. pretests, posttests, and the delayed tests to all the groups; taught all the groups separately during the treatment sessions; and administered the questionnaire and the self-reflection papers with the experimental group. These were all administered during the Fall Semester in the academic year 2017/2018, both at SEEU and IBU campuses in Tetovo and Skopje.

## 3.4 Materials

#### 3.4.1 Data collection instruments

The present study used several data collection instruments since it aimed to answer wide-range of research questions, adding the fact that it is was both quantitative and qualitative research. Namely, tests (pretest, posttest, and delayed test) were administered to measure learning and retention, a questionnaire was used to provide statistical data on learners' beliefs and attitudes, and a self-reflection paper was used to complement the questionnaire. Below, we discuss these data collection instruments in more detail.

#### 3.4.1.1 The Tests

Three tests were used in the current study: a pretest, an immediate posttest, and a delayed test. However, all the tests were the same tests as they were aimed to test previous (pre-treatment) lexical knowledge and to monitor language development during an extended period of time. Therefore, the detailed description of the test provided in this section applies to all the tests.

The test was designed to measure gains and retention of the words taught in the treatment sessions and it included three sections. The first section was comprised of nine Vocabulary Knowledge Scale (VKS) type questions (see Figure 3.1 below) adopted from Paribakht and Wesche (1997). It included a number of words with the affixes covered thorough the sessions, which include: fore-, co-, -proof, -related, ill- and over-. The VKS questions are typically designed to assess the students' actual knowledge of certain vocabulary as well as the depth of (also productive) word knowledge, i.e. whether they can use the words in sentences. The test included several categories of a word knowledge which participants were required to circle or fill out depending on how much they knew about the particular word given there. These categories, as Figure 3.1 below illustrates, included: The first category is circled in cases when a student sees the word for the first time; the second is selected if the word seems familiar but the meaning is not known to the student; the third category requires the student to write the meaning, that is, using a synonym or translation, but only if there is still a degree of uncertainty in the student; the fourth category is filled out only if the student is certain of the meaning of the word; and the last requires the student to write a sentence with the word given which is considered a more advanced knowledge in this scale, but in that case he is also required to fill out category IV.

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#### WORD: ill-equipped

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:	
(Write a sentence.) (If you do this section, please also do Section IV.)	

Figure 3.1 Sample VKS question (Paribakht and Wesche, 1997) used in the test

The second section was comprised of a task in which participants were required to insert one to six words, depending on how many they knew or remembered, that combine with each of the six affixes covered in the treatment sessions. An example word was given under each of the affix in order to aid the student in completing the task. The last section included a task in which word halves were given in two separate boxes. The right box contained the same prefixes and affixes mentioned earlier while the other box contained several words that could possibly combine with the affixes. Also, extra words were added to the same box in order to make the task more challenging for the students. Below the boxes, six sentences with gaps were given in which a combination of words with affixes from the boxes were supposed to be inserted in order for the sentences to be completed. A sample test can be found in *Appendix B*.

## 3.4.1.2 The scoring method of the tests

The scoring system of the test varied in each section of the test. The VKS type questions scoring method was done in categories depending on the actual vocabulary knowledge: 1 point for each correct answer in category III, 2 points for each correct answer in category IV, and 4 points for each correct answer in category IV. The scoring system of task two was in a way that for each question, out of six questions in total, a score between 0 to 9 points was possible depending on number of words inserted in the gaps. For each word inserted, one scored 1.5 points. The total score of task 2 was 54. Finally, the last task in the test contained six questions

and for each correct answer, one scored 1.67 points. The maximum score in this section was 10 points.

The scoring method given above is described for each task in isolation. The complete test scoring for the purpose of answering some of our research questions, however, is not done in isolation but rather in combination and it depended on several classifications or types of vocabulary knowledge: overall test scores, overall vocabulary knowledge scores, receptive vocabulary knowledge scores, and productive vocabulary knowledge score. Classifying the overall vocabulary into receptive vocabulary knowledge and productive vocabulary knowledge in the test was done based on criteria set by Nation (2000), as discussed earlier in the literature review chapter.

In the overall test scores, as the name itself suggests, total points of the test were calculated and all the scores in each tasks were included. In the VKS section, if one provided an answer in category III it was taken as 1 point, if one provided a correct answer in category IV it was taken as 2 points, and if one provided a correct sentence in category V together with a definition in category IV it was taken as 4 points and, in that case, category IV points were not added. The maximum score in the VKS was 36 points. Both task 2 and task 3 were also included in the overall test score calculations, with the former contributing with maximum 54 points, and the later with 10 points maximum. The maximum score for this classification, including all tasks scores, was 100 points.

For the purpose of overall vocabulary gains, i.e. overall vocabulary knowledge, a different scoring method was used. In this particular classification only category III and IV from the VKS were calculated by excluding points from category V, as scores for vocabulary gains were the only aim rather than a deeper knowledge of the vocabulary (i.e. the ability to use the words in sentences). The total score of the VKS section in this particular classification was 18 maximum. Task 2 and 3 contributed with the same total scores as in the previous section, 54 points and 10

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points respectively. The maximum score for the overall vocabulary knowledge was 82 points. For statistical purposes, these points were later converted into 1-100 system.

In order to assess the receptive vocabulary knowledge of the participants, a different test scoring method was used. Namely, only category III and IV from the VKS were calculated as these were considered to represent receptive knowledge of words. Similar to the previous classification, the VKS section contributed with the total score of 18 points while task 3 contributed with the same total scores as in the previous section, 10 points total. Task 2 was excluded from calculations as it was considered productive vocabulary knowledge. The maximum test score for the receptive vocabulary knowledge, as a result, was 28 points. For statistical purposes, these points were also converted into 1-100 (point) system.

In order to assess the productive vocabulary knowledge of the participants, a different test scoring method was used. Namely, only category V scores from the VKS and task 2 scores were included in the calculation as these were considered productive vocabulary knowledge. The VKS section contributed with the total score of 36 points while task 2 contributed with the total score of 54 points. The maximum test score for productive vocabulary knowledge, as a result, was 90 points. For statistical purposes, these points were also converted into 1-100 (point) system.

## 3.4.1.3 The Questionnaire

Another statistical data collection instrument used in this study was the questionnaire. This data collection instrument was administered to all the experimental group participants and it was aimed to contribute to answering the research questions in this study in addition to the rest of the instruments, i.e. the tests and the self-reflection papers. It was comprised of two sections: the first section included rating scale questions ranging from 'very easy' to 'very

difficult'; and the second section was comprised of sixteen Likert type questions ranging on a scale from 'strongly agree' to 'strongly disagree'.

The first section of the questionnaire consisting of four rating scale questions was designed to have respondents rate several corpus-related and DDL aspects in terms of difficulty. Under each question, ticking boxes ranging from 'very easy' to 'very difficult' were available for the respondents to mark, by providing the rating that was true to them. The rating questions asked the respondents to rate the difficulty of: using the corpus (*IntelliText*) to search words with prefixes / suffixes; finding the meaning of words in the corpus (without a dictionary); English (understanding the language) in the corpus; and the method (learning vocabulary with corpus/technology). At the end of this section of the questionnaire, a space was available for additional remarks. Comments were especially encouraged by those respondents who ticked 'hard' or 'very hard' in any of the rating scale questions. This section was aimed to get valuable feedback from respondents on why they found anything related to using corpora and DDL difficult or very difficult.

The second section of the questionnaire was comprised of sixteen Likert scale questions. Respondents were required to share their attitudes and views on each statement given there by marking one of five point scales ranging from 'strongly agree' to 'strongly disagree'. The statements were designed to explore respondents' opinions on various aspects of corpus as a learning tool and DDL as a learning technique. More specifically, this part of the questionnaire aimed to explore attitudes towards: the corpus they used in the study; the training sessions and their usefulness; the activities during the treatment sessions; the examples or concordance lines, and so on. A section for additional comments was also added at the end of the questionnaire for those who had to add additional remarks on their vocabulary learning experience with corpora. The full version of the questionnaire used in this study is available in *Appendix C* at the end of this dissertation.

In conclusion, it is important to mention that this questionnaire was piloted before the present study was carried out. For more details on the piloting of the questionnaire, you may refer to section *3.2* in which the pilot study is discussed in more detail.

## 3.4.1.4 The Self-reflection Papers

The self-reflection paper was used as an additional data collection instrument in addition to the tests and the questionnaire. In fact, it was aimed to complement the questionnaire with more in-depth insights about the experiences and attitudes of the experimental group participants towards learning new words with affixes through corpora and DDL. The papers contributed with qualitative data for the present study.

The paper contained some guiding questions at the beginning in order to guide participants in their writing. The questions were similar to some of the statements in the questionnaire and the reason behind this was to get more insights from students on those particular topics. The questions in the self-reflection paper were as follows:

- What do you think of corpora as language learning tools (e.g. to learn vocabulary etc.)?
- Did you find this teaching/learning method easy/difficult, in what way?
- What do you like and dislike about using a corpus in learning vocabulary?

- Do you think corpora should be used in English language classes and why?

The rest of the paper was blank in which participants were asked to write their views and perspectives based on these questions as well as write other remarks which they thought were significant. A sample of the self-reflection paper used in this study can be found in *Appendix D*.

## 3.5 Procedure and research design

## 3.5.1 Research design

The present study has adapted a mixed research design, in which techniques from both experimental research design and survey research design have been applied.

Since this research involved "intentional manipulation of variables" (Loewen & Plonsky, 2015, p. 62), it is not considered descriptive but rather experimental in nature. More precisely, it is considered a quasi-experimental research as a convenience sampling was used over a randomized assignment of participants in groups. This study, as *Figure 3.2* below illustrates, involved a pretest and posttests as dependent variables as well as a treatment in between the tests as an independent variable. It is important to note that the current study also included a delayed test, a type of posttest, which, as the name itself suggests and in contrast to the immediate posttest that is applied right after the treatment, is delayed in order to check retention.



Figure 3.2 An illustration of experimental research design (Griffee, 2012)

This study also used a technique from survey research design in order to obtain more data from the experimental group participants involved in the study. Namely, it used questionnaires for the purpose of gathering data related to participants' attitudes towards the corpus and DDL as a teaching and learning technique. In addition, this research included self-reflection papers as an additional data instrument to the questionnaire. In fact, the data obtained from the papers was expected to expand and complement the data obtained from the questionnaire.

Based on the discussion so far, we can say that the current study can be treated as both quantitative and qualitative. It is quantitative since it will use quantitative data instruments, such as tests and questionnaires, to obtain sufficient and accurate statistics in order to answer some of the research questions involved in the study. It is also considered qualitative as self-reflection papers will be used to gather data which is more concerned with participants' experiences, views, and suggestions on corpora as reference and learning tools and DDL as a technique.

## 3.5.2 The Quick Placement Test (QPT)

With each group, a quick placement test or a diagnostic test was administered in order to ensure that there are no significant differences in language proficiency among the groups as this would affect the main test results. The test was administered to each group separately, that is, to control group 1, control group 2, experimental group 1, and experimental group 2.

The test was comprised of 50 questions, from which 40 were grammar questions whereas the remaining 10 questions were related to vocabulary knowledge. The questions were all multiple choice questions in which participants were required to choose the correct answers. The duration of the test was 30 minutes for each group. The scoring method of the QPTs was based on points and on the corresponding level: (0 - 15) Beginner, (16 - 24) Elementary, (25 - 32) Pre-Intermediate, (33 - 39) Intermediate, (40 - 45) Upper-Intermediate, and (46 - 50) Advanced.

QPT scores indicate that both the experimental group and the control group had similar language proficiency. Namely, the experimental group average score was 41.2 while the control group average score was 41.9. It is evident that the average scores of both groups are very similar with the latter group scoring slightly better, but does not show to be a significant advantage. The scores of both groups clearly show that, on average, both groups' language proficiency was at early upper-intermediate. It is also important to mention that all groups with no exception comprised of students with various language proficiency ranging from intermediate to advanced level. Students whose language proficiency was below intermediate level were excluded from the study. From the overall participants two students were excluded from the study because of low scores in the QPT and it was predicted that they may have impact on the main test scores. A more detailed QPT average score figures are given in *Table 3.1* given below.

Group	QPT average score of each group separately	QPT average score for the Control & Experimental groups
Control group 1	41.3	
(1 <sup>st</sup> year SEEU students):		
Control group 2	42.6	
(2 <sup>nd</sup> year IBU students):	.2.0	
Experimental group 1	42	
(1 <sup>st</sup> year IBU students):	12	
Experimental group 2	40.5	
(3 <sup>rd</sup> year SEEU students):	-0.5	

Table 3.1 Diagnostic test average scores of all groups

It is also important to note that third-year students (experimental group 2) do not show to have scored better than the other 1<sup>st</sup> year and 2<sup>nd</sup> year groups in the QPT. In other words, the scores indicate that this group's language level showed to be very identical to the other groups' although it had been expected from them to have shown at least some better test scores considering that they had received more instructions (as they were in their third year of studies) than other groups students.

In this section a detailed description of the QPT was provided. Based on the average scores of both the experimental and control groups, it is reasonable to conclude that the language proficiency of the participants in all groups has not had any impact on the main test scores, or at least it hasn't had any significant effect, since they show very similar language proficiency.

### 3.5.3 An overview of the study procedures

The study included several stages and it was completed in a period of four weeks for the experimental group whereas for the control group in a period of three weeks considering that the later didn't have the corpus training session. Firstly, a quick placement test (discussed in the last section) was administered to both groups in order to see the overall language proficiency of the participants in each group as well as to ensure that significant differences in proficiency do not exist as they would affect the test results. Before the pretest was administered to both groups, the experimental group was provided with a preliminary corpus training in which participants were equipped with corpus skills before the treatment sessions took place. After the pretest was administered to both groups, two treatment sessions followed: one was done right after the pretest while the other was held in the following week. A posttest was administered to both groups immediately after the second treatment session in order to check short-term gains from the treatment. In the same day, all the experimental group participants were administered a questionnaire, while only some of them, who were selected randomly, were asked to write a self-reflection paper which added to the qualitative part of the study. Lastly, all groups were administered a delayed test in the following week (i.e. the final week) which was intended to test retention. An overview of the overall study and procedures is given in *Figure 3.3* below.



Figure 3.3 An overview of the current study stages and procedures

# 3.5.3.1 Corpus training session

The experimental group participants initially underwent a corpus training session prior to treatment sessions. The preparation session was done following recommendations by Gilquin and Granger (2010) who consider training as an essential part and prerequisite to any corpusbased language activity with language learners. Thus, the purpose was to make the experimental group students familiar with the software, including the layout, the features, and the necessary techniques which are necessary in finding words with affixes. In addition, participants were expected to become more efficient in corpus use by overcoming technical obstacles as well as corpus anxiety, if any. Hence, the ultimate aim of the session was to have the experimental group participants properly trained in order to avoid any hindrances, be that technical or emotional, that they may have during the treatment sessions as they would impact the test results. It is important to mention that the initial plan had been to offer sufficient training for the participants since that is what the literature recommends, but due to time constraints and the busy academic schedule we could not afford to provide more than one corpus training session prior to the study.

The training session lasted an hour and it was offered to the experimental group, that is, the IBU group and the SEEU group separately. The IBU group was trained in the IBU Computer Lab whereas the other SEEU group was trained in one of the SEEU Computer Labs. Both groups were trained in using *IntelliText* as this was the corpus which was going to be used in the treatment session.

The training session included instructions and tasks. Firstly, students were given step-by-step instructions on *IntelliText* use. This included: ways to use the corpus in general; corpus steps and procedures to find words with affixes; advices and guidelines on how to interpret the word list results; ways to generate concordance lines from the word list, i.e. for each word listed; and some strategies on how to interpret concordance lines in terms of meaning of words or how to infer meanings from corpus data since this was going to be essential in completing the tasks during the treatment sessions.

Secondly, the training also comprised of two tasks. These tasks resembled the tasks in the actual treatment sessions and were aimed to get participants set for the real tasks that followed. Similar to the tasks in the treatment sessions, in each task students were given an affix to explore in *IntelliText 2.6* corpus. Note-taking sheets were also included in order to aid the participants in their tasks. The note-taking sheets were not blank, but rather included hints, examples, and tasks with guidelines. Each sheet incorporated: the meaning of each affix; an example word (containing the affix) and a sentence of that word extracted from the corpus; tasks with other words with the same affix, the meaning of which students were required to infer from the concordance lines; a blank space under each of these words in which an example from the corpus could be inserted by the students; and a section with some blank spaces in

which participants were required to fill in with the most frequent words containing the actual affix by referring to the corpus word lists. After each task (i.e. after each note-taking sheet was filled out with data from the corpus), findings were shared with the class.

The role of the instructor was more dominant in the training session as the experimental group participants had no preliminary knowledge on corpus and its use. The instructor had his own computer and a projector available to provide step-by-step instructions on how to use the software and how to do corpus queries. The students, on the other hand, had their own computers in front of them and followed the instructions by going through the same steps provided by the instructor. During the tasks, the instructor did the word queries in the corpus (with the projector on) together with the students in case some of them needed more assistance as well as to make sure all the students are coping with the task. If time allowed, the instructor moved around the classroom to ensure students were doing their tasks as well as provide assistance if needed. In the end, the instructor asked the students to share their findings and this was done aloud so everyone in the class could hear them. The instructor made sure he intervened whenever incorrect conclusions were drawn by the students.

### 3.5.3.2 The Pretest

The pretest was administered to both the experimental and control groups. For the experimental IBU group and SEEU group the pretest was administered a week after the corpus training session in which participants were prepared for the treatment sessions. For both the control IBU group and SEEU group, on the other hand, the pretest in fact marked the beginning of the research as they didn't have any training session prior to the treatment sessions as the experimental groups. All groups were administered the same test and it was aimed to assess all the participants' preliminary lexical knowledge before treatment took place.

The experimental group(s) was administered the pretest right before treatment session one. The experimental IBU group, consisting of twenty students, took the pretest at IBU campus premises in Skopje, more precisely, in the IBU Computer Lab as the following first session was planned to include the use of computers. Students were given instructions on how the test is done as well as explanations about the test content and the tasks prior to the test. They were notified and ensured that the results of the test would not affect their university success and that they would be kept private and used only for research purposes. The pretest with this particular group was administered in the morning, starting at 08:15, and lasted thirty minutes. The other experimental group which consisted of ten students, on the other hand, took the pretest at SEEU campus premises in Skopje. Similar to the other experimental group, the group was gathered in the campus Computer Lab as the following first treatment session was planned to use computers and the corpus. Students were given instructions on how the test is done as well as explanations about the test content and the tasks prior to the test. They were notified and ensured that the results of the test would not affect their university success and that they would be kept private and used only for research purposes. The pretest with this particular group was administered in the afternoon, starting at 13:00, and lasted thirty minutes. The test was administered successfully to both experimental groups without any delays or problems.

The control group(s) was also administered the pretest right before the first treatment session. The control IBU group, consisted of sixteen students, took the pretest at IBU campus premises in Skopje, in one of the IBU regular classrooms. Students were given instructions on how the test is done as well as explanations about the test content and the tasks prior to the test. They were notified and ensured that the results of the test would not affect their university success and that they would be kept private and used only for research purposes. The pretest with this particular group was administered in the morning, starting at 09:30, and lasted thirty minutes. The other control group which consisted of twelve students, on the other hand, took the pretest at SEEU campus premises in Tetovo. Similar to the other control group, the group was gathered in one of the campus regular teaching classrooms. Students were initially given instructions on how the test is done as well as explanations about the test content and the
tasks. They were notified and ensured that the results of the test would not affect their university success and that they would be kept private and used only for research purposes. The pretest with this particular group was administered in the morning, starting at 08:30, and lasted thirty minutes. The test was administered successfully to both control groups without any delays or problems.

### 3.5.3.3 Treatment

The treatment involved two sessions and lasted two consecutive weeks, meaning one session was held in each week. For the experimental group, the treatment started a week after the corpus training session and immediately after the pretest, with a brief five-minute break. The same was with the control group with the only difference being that this group did not have a training session. Each treatment session lasted 60 minutes, slightly longer than the length of a regular class, for all the groups. In this particular session, the groups were introduced and taught new word forms. The affixes in the first session included the prefixes *co-* and *over-*, and the suffix *-proof*, while the second session included the suffixes *-related* and *-ill*, and the prefix *fore-*. The treatment, however, varied between the experimental group used computers and a corpus during the treatment whereas the control group was taught in a more traditional way. Below we discuss the treatment in more detail for both groups separately.

### 3.5.3.3.1 Treatment (First session) – the Experimental group

The experimental IBU group, which consisted of twenty students, received the treatment in the IBU campus premises in Skopje, i.e. in the IBU Computer Lab, since computers and the corpus were planned to be utilized during both sessions. The first session with this particular group started at 08:50 in the morning, and followed the pretest. The other experimental group, which

consisted of ten students, on the other hand, received the treatment at SEEU campus premises in Skopje. Similar to the other experimental group, the group was gathered in the campus Computer Lab in order to use computers for the purpose of this study. The session with this group started at approximately 13:35 in the afternoon, and took place right after the pretest with a five-minute break in between. As pointed out earlier, this session lasted sixty minutes for both groups. Below, we discuss the session in more detail and it concerns both experimental groups.

At the beginning of the session, the experimental group participants were initially informed of the overall class and the tasks they were required to do with the help of the corpus. It is important to mention that these tasks were familiar to them considering that they had done similar tasks in their corpus training session a week earlier. They were told that: they would be exploring and learning new words with three affixes and they would be using *IntelliText 2.6* interface to find the words; they would be using note-taking sheets as a guide in their activities and that they resembled the ones they used in the training session; the instructor would be moving around in case they needed assistance while exploring the corpus and the concordance lines; and that they would be required to share their findings which would be discussed together with the class.

Next, participants were given three note-taking sheets similar to the ones used in the training session. Each of them incorporated a new affix and was utilized in each task out of three tasks in total. The note-taking sheets were aimed to support the participants in their tasks and their layout included: the general meaning of each affix in isolation (when not combined with any word); an example word (containing the affix), its meaning, and a sentence with that word extracted from the corpus; some words with the same affix the meaning of which students were asked to infer from the concordance lines; a blank space under each of these words in which an example from the corpus could be inserted by the students; and a section with some blank spaces in which participants were required to insert the most frequent words containing the actual affix based on the frequency list provided by *IntelliText*. The participants were

instructed to use each of the note-taking sheets during the three overall activities throughout the session.

Afterwards, the instructor introduced one of the new affixes by explaining how much productive it is in forming new words in English and then moved on to explain what it generally meant by using one of the note-taking sheets containing that particular affix. He then noted that many other words combine with the same affix and that their task would be: to explore and find some frequent words which combine with that affix, and to use the concordance lines to infer the meaning of the rest of the words provided in the note-taking sheets as well as to extract some example sentences of their preference for these words. The idea of having the participants infer the meaning of some words was based on McCarthy, O'Keeffe, and Walsh (2010) who claim that:

At more advanced levels, learners need to become more independent and develop appropriate metacognitive strategies for dealing with new words, such as guessing meaning from context, inferring and using world knowledge and contextual clues to predict the meanings of new words. (p. 108)

as well as Nation (2009) who maintains that:

The advantage of the concordance is that all these examples can be readily compared with one another and more deliberate generalizations made from them. It also means that a guess at the meaning of a word is more likely to be successful, as there is much more data available. (p. 553)

Afterwards, the students were asked to open *IntelliText* and start exploring new words with the newly introduced affix. In addition, they were told to use the note-taking-sheet in front of them to fill it out with data collected from the corpus and the concordance lines. The participants then proceeded with using the corpus to do the first activity. Firstly, they opened the main page of *IntelliText* interface and selected the *British National Corpus* as the default corpus. In the KWIC box they inserted the first affix, i.e. the prefix *co*-, in order to launch the corpus search. It

is important to point out that that the instructor started the session by introducing the affix *co*on purpose, considering that it was an easy one to begin with since it has a single meaning when combining with words compared to other affixes used in this study which have multiple meanings depending on the word with which they combine. Thus the purpose was to move from the easiest affix to more advanced ones and it was considered a useful one to start with.

English BNC	
Concordance	
Collocation	
✓ Affixes	
<ul> <li>Search for any base words with co-</li> <li>Search for this base word lemma</li> <li>Find base words with PoS matching anything</li> <li>Search</li> </ul>	<ul> <li>as Prefix</li> <li>as Suffix</li> <li>Highlight likely non-affixed forms</li> <li>with Prefixes</li> <li>with Suffixes</li> <li>PoS Editor</li> </ul>
Compare Frequencies	
<ul> <li>Key Words and Phrases</li> </ul>	
<ul> <li>Multivariate Analysis</li> </ul>	

Figure 3.4 The KWIC searching box and searching options for words with affixes in IntelliText 2.6

Participants were already trained to use the 'Search for any base words with' option box as this would provide words that combine with the affix inserted in the box, and avoid the option 'search for this base words' as it would search for lemmas instead of words with certain affixes. Also, they avoided selecting 'highlight likely non-affixed forms' because this would usually take time to insert results and that was not convenient for this study due to limited time available.

After the searching was completed in the corpus, students were able to see at a frequency list of words with the affix starting from the most frequent one in the *BNC* (*Figure 3.5*).

Page Choose	Language	Choose Co	orpora	Choose Type of Search	View Results
<< first < prev	1 <u>2 3 4</u>	<u>567</u>	<u>8 9 10</u>		
	Lemma	Forms	Count -		
	<u>co-star</u>	<u>8</u>	148		
	co-founder	3	106		
	co-author	4	101		
	co-worker	2	91		
	<u>co-exist</u>	1	88		
	co-defendant	2	65		
	co-pilot	<u>3</u>	64		
	co-existence	2	60		
	co-sponsor	<u>5</u>	54		
	co-processor	2	52		
	co-option	<u>5</u>	51		
	co-write	4	51		
	co-chairman	<u>5</u>	49		
	co-chair	4	41		
	co-partner	2	36		
<< first < prev	1 <u>2</u> <u>3</u> <u>4</u>	<u>567</u>	<u>8 9 10</u>	<u>next &gt; last &gt;&gt;</u>	

Figure 3.5 IntelliText (Word list) results of the most frequent words with the affix **co-** in the BNC

Students used this list to complete the tasks included in the note-taking sheets. Firstly, they used it to find the words included in the note-taking sheets the meaning of which they were required to infer from the concordance lines. In this particular phase they found the word on the list, clicked on it, and the corpus generated concordance lines for that word. The students looked through the concordance lines (*Figure 3.6*) in order to infer meanings or confirm a meaning if they had doubts. Additionally, they extracted one example of their choice for each word from the concordance lines and added it to the note-taking sheet as this was part of the task. As concordance lines typically display incomplete sentences, participants clicked on any of the sentences the wished in order to open a complete view, with even more context, of that sentence if necessary. Secondly, they navigated through the word list and chose some words of their preference and completed the last section (task) of the sheet in which some blank spaces were included for the participants to insert words containing the affix under investigation.

During the time the participants were investigating the corpus, the instructor moved around the classroom in order to ensure they were doing their tasks as well as to provide assistance for those students who had issues, such as technical problems with the corpus and difficulties with interpreting data. Thus, his role was more of a facilitator in the process rather than telling them what to do.

titleid	left	match	right
<u>A03</u>	authorities claimed they were conspiring to	overthrow	the government, which is dominated
<u>A03</u>	President Moussa Traoré was	overthrown	. At least 40 people were killed in
<u>A03</u>	which found him guilty of attempting to	overthrow	the government. Hew was convicted on
<u>A03</u>	accused of calling for the violent	overthrow	of the monarchy. Srifi was a member
<u>A03</u>	authorities claim they entered to try and	overthrow	the government. The Chirwas say they
<u>A03</u>	on charges including conspiracy to	overthrow	the government and possessing leaflets
<u>A03</u>	coups in Morocco which had attempted to	overthrow	King Hassan II. Her mother was only
<u>A07</u>	proportionate degree of violence to	overthrow	tyranny. Many Irish catholic nationalists
<u>A07</u>	Ireland. Therefore they find it just to	overthrow	the Northern statelet by whatever degree
<u>A1A</u>	concept of literature itself, have to be	overthrown	. There is a great readiness to invoke
<u>A1T</u>	dialectic resolvable in principle by the	overthrow	of one of its polarities. Instead they
<u>A28</u>	flames, " he said. The JVP, fighting to	overthrow	the government for the past two-and-a-half
<u>A28</u>	Editor HAD GENERAL Manuel Noriega been	overthrown	by rebel troops, it would have meant
<u>A3D</u>	was the US, which is committed to the	overthrow	of the Kabul regime by the mujahedin
<u>A3N</u>	Manuel Noriega, the man they failed to	overthrow	, is now turning his wrath to civilian
	<< first < prev	1 <u>2</u> <u>next &gt;</u>	last >>

Figure 3.6 An excerpt from the concordance lines for the word 'overthrow' in IntelliText

When the participants finished with investigating the first introduced affix and filling out the first note-taking sheets with data collected from the corpus and concordance lines they were asked to share their findings with the instructor and the class. Namely, they shared the meanings they inferred for the words from the concordance lines and the examples they extracted from corpus as well as words they found interesting which combine with that particular affix. In this particular phase of the class, there was an extensive students-instructor interactivity in which interventions or corrections were provided by the instructor in cases when students misinterpreted the data found in the corpus. For instance, in cases when a student would infer a wrong meaning for a word or overgeneralizing cases with affixations, say

by considering the part *over* as a prefix of the word *overall*. Therefore, this phase was crucial to students as they would generalize about some rules of the affix being discussed: the most frequent words that combine with the affix; various meanings that various words get when in combination with it; how these words are typically used in contexts; and exceptions if encountered.

After finishing exploring and discussing these findings with the class, the experimental group students were introduced the other two remaining affixes separately, i.e. the prefixes *over*- and the suffix *-proof*, until the end of the session by following the same steps as the firstly introduced affix *co*-. For this purpose, the participants used the other two remaining note-taking sheets for each affix. One difference was that the affixes *over*- and *-proof* were searched without an hyphen in the KWIC box in the corpus because words that contain the former affix do not normally have one while the later usually appear as both hyphenated and without an hyphen in English, and in order to get both combinations appear in *IntelliText*, the search had to be done without an hyphen. At the end of the first treatment session, the note-taking sheets were collected and kept by the instructor so they could be given back to the participants for a review before the immediate posttest after the completion of the last session.

The class with the experimental group, as we can see from the class description above, generally followed an inductive approach and was designed based on the three IIIs paradigm recommended by McEnery & Xiao (2011). In the *Illustration* phase learners explored the affixes by using word list generated by *IntelliText* and by exploring concordance lines for more linguistic insights, such as word meanings and example sentences. In the second phase, that of *Interaction*, the participants shared the corpus findings with the instructor and with the rest of the class. Lastly, in the *Induction* phase the experimental group participants inferred rules and made generalizations on the investigated affixes and the words containing these affixes based on their individual findings recorded in their note-taking sheets as well as during the interaction phase in which collected data was discussed between the instructor and the class. In addition to three IIIs a fourth phase was used between that of Interaction and Induction. This phase was

*Intervention* and it was adopted from Flowerdew (2009) which is discussed in more detail in the Literature Review. As we can clearly understand from the class procedures, in this particular phase the purpose was to intervene in cases when students' findings were misleading or misinterpreted, as in the case of overgeneralizations mentioned earlier. In other words, the instructor intervened whenever one shared incorrect or misinterpreted data and insights by correcting them. The same could be said for cases when instructor did not intervene, but agreed with those participants who shared correct findings with the instructor and the class. For some who had similar findings these were confirmations that they gathered correct data whereas for some who realized their mistakes based on the discussion had the chance to correct them silently without being noticed.

Although generally inductive, the approach used with the experimental group was not strictly inductive but rather a balanced one. The decision for a softer version of DDL was made based on two main reasons. Firstly, discussions in the literature suggest that a softer and a more balanced inductive-deductive approach may be necessary in order for DDL to succeed. Some of these stances were discussed in more depth in the Literature Review section earlier. For instance, we mentioned Boulton (2010) who advocates a balanced approach in which the teacher would have a more dominant role unless the students cope well with various corpus investigations and tasks. Flowerdew (2009), on the other hand, believes that clues should be provided in order to make DDL softer and easier for language learners. As it is apparent from the description of the class provided above, these considerations were taken into account when designing and implementing the experimental group treatment. For instance, the instructor initially introduced each affix and provided background information before letting participants proceed with their corpus searches; note-taking sheets included clues (such as the meaning of the affix) for the students and were not blank; the instructor moved around the classroom to provide support when necessary and the activities and tasks were thus not fully autonomous; last but not least, the instructor used the Intervention stage which could be also seen as balancing. Secondly, the decision for a more balanced DDL was made based on the insights obtained from the Pilot Study. As it was concluded there, a strict inductive DDL resulted to be

hard for many of the participants. Therefore, valuable clues and experiences from the pilot study were taken into account in the main study, especially in the case of the effectiveness of purely inductive DDL. For more discussion on this issue, you may refer back to section *3.2* where pilot study results and experiences are discussed in more detail.

#### 3.5.3.3.2 Treatment (Second session) – the Experimental group

The experimental group had their second treatment session a week later from the first session. The schedule, the duration, and the premises for the second session concerning both the experimental groups were the same as the first session. For the sake of avoiding repetition, we will skip describing these. For details related to the overall settings of the experimental group, please refer to the first treatment description above. Next, we provide a brief description of the second session and it concerns both experimental groups.

The second treatment for the experimental group was very similar to the first session, as similar procedures were used. At the beginning, the participants were initially briefed about the class and were told that they were going to investigate three more affixes, that is, the affixes: – *related, fore-* and *-ill*. Afterwards, they were given new note-taking sheets with the newly introduced affixes and with the same format as those used in the first session. The first investigation of the first affix *-related* followed using the same corpus interface online, *IntelliText 2.6.* As in the first session, the instructor moved around the classroom in order to provide support if needed. After the participants finished with the data collection, they shared their findings with the class, while the instructor made sure the findings were valid and provided corrections if necessary. The same steps were followed while participants investigated the rest of the affixes, i.e. *fore-* and *-ill*, until the end of the session. One difference that distinguished this session from the first one is that the instructor tended to provide less support for the participants during the corpus investigations as they were now more accustomed to the corpus queries and increasingly more skillful at data collection. This was based on the idea that

more instructor role is needed in the initial phase of DDL activities in the language classroom and that more autonomy could be given to learners if they are noticed to cope well with concordance lines and DDL tasks (Boulton, 2010).

After the treatment session was finalized, the participants were given back both their first session and second session note-taking sheets with the data (notes) they had collected from the corpus for review. The review lasted ten minutes and it was intended to prepare the participants for the following immediate posttest.

### 3.5.3.3.3 Treatment (First session) – the Control group

The control IBU group, which consisted of sixteen students, received the treatment in the IBU campus premises in Skopje, in a regular classroom setting. The first session with this particular group started at 10:05 in the morning, and followed the pretest with a five minute break in between. The other control group, which consisted of twelve students, on the other hand, received the treatment in the SEEU campus premises in Tetovo. Similar to the other control group, this group received the treatment in a regular classroom. The session with this particular group started at approximately 09:05 in the morning, right after the pretest with a five-minute break in between. As pointed out earlier, this session lasted sixty minutes for both groups. Below, we discuss the session in more detail and it concerns both control groups.

At the beginning of the session, the control group participants were initially informed of the overall class plan. Namely, they were told that they will be introduced some new affixes and that they will be learning new words that combine with them. The instructor asked the participants to share ideas or examples if they had and encouraged them to interact with him during the instructions. Also, they were told that blank note-taking sheets would be provided for them and that they would be required to take notes as much as they could during the session.

Next, participants were given the note-taking sheets and then one of the affixes, i.e. the prefix *co*-, was introduced to the class. The instructor provided the meaning of the affix, that is, that the general meaning of this prefix is 'together with' and that it typically combines with the meaning of the word with which attaches, such as *co-founder*, which means someone who founds something together with someone else. Participants were then told that this particular affix is very productive in English and that it can combine with nearly all the nouns referring to any job that could be shared by two or more persons (Bradbury, 1991). The instructor then provided words that combine with this affix. For each word he provided an example with the word in context. During this process, he also elicited words with this prefix from participants as well as asked them if they could provide examples. The newly introduced vocabulary and example sentences given by the instructor, as well as those (correct ones) provided by the participants, were written on the whiteboard so everyone in the classroom could be able to see and write it down on their sheets.

After the first affix was covered and discussed, the class proceeded with the rest of the affixes, i.e. *-proof* and *over-*, while similar method of instruction was applied to the all three affixes. The instructor made sure all the participants took notes during the instruction phase. Before the session was completed, all participants were required to do an exercise. The exercise was comprised of sentences with gaps which participants had to fill-in with a correct word. Upon finishing the exercise, the participants shared their answers with the instructor and the class. If there were incorrect answers, the instructor made sure he provided the correction. The exercise was planned to be a follow-up activity and aimed to strengthen the participants vocabulary covered during the session. At the end of the first treatment session, the sheets with their notes were collected and kept by the instructor so they could be given back to the participants for a review before the immediate posttest after the completion of the last session.

As it is obvious from the class description above, the study adopted the PPP (Presentation-Practice-Production) paradigm to teaching the control group. As opposed to the experimental group to which a more balanced inductive-deductive approach was adopted, the control group method was rather deductive. Namely, students were initially presented rules which were followed by many examples. After that, participants had an exercise in which they had the opportunity to practice the newly introduced vocabulary. Thus, the control group sessions were more teacher-centered compared to the experimental group sessions as the instructor was more dominant in the class, although students were encouraged to share ideas and interact with the instructor.

#### 3.5.3.3.4 Treatment (Second session) – the Control group

The control group had their second treatment session a week later from the first session. The schedule, the duration, and the premises for the second session concerning both the experimental groups were the same as the first session. For the sake of avoiding repetition, we will skip describing these. For details related to the overall settings of the control group, please refer to the first treatment session description above. Next, we describe the second session and it concerns both control groups.

The second treatment for the control group was very similar to the first session, as similar instruction procedures were used. At the beginning, the participants were initially briefed about the class and were told that they were going to investigate three more affixes, that is, the affixes: *—related*, *fore-* and *-ill*. Afterwards, they were given new blank sheets in order for them to take notes on new vocabulary with affixes. Firstly, the suffix *—related* was introduced and taught by providing multiple words that combine with it and sentences. As in the first session, the instructor also elicited ideas and words from the participants related to the newly introduced affixes. Plentiful of new words and example sentences were written on the whiteboard for them to write on their note sheets. The same steps followed while participants were taught the rest of the affixes, i.e. *fore-* and *—ill*. Before the session was completed, all participants were required to do an exercise which was similar to the one done in the first

treatment session. The exercise was comprised of sentences with gaps which participants had to fill-in with the correct word. Upon finishing the exercise, the participants shared their answers with the instructor and the class. If there were incorrect answers, the instructor made sure he provided the correction.

After the second treatment session was finalized, the participants were told to hold the second session note-sheets and were given their first session sheets with their notes back so they could review the notes from both sessions. The review lasted ten minutes and it was intended to prepare the participants for the following immediate posttest.

### 3.5.3.4 The Immediate posttest

The immediate posttest took place right after the second session for all the experimental and control groups. Most precisely, it followed the review of the vocabulary (recorded in their sheets) with a ten minutes break in between and it was administered in the same premises where the pretest and both sessions were held. The test, as pointed out earlier, was the same as the pretest and it lasted strictly the same amount of time as the pretest. The test was administered successfully to all groups.

As opposed to the pretest which was aimed to assess all the participants' preliminary lexical knowledge before the treatment, the posttest was intended to assess their immediate gains from the first and second treatment session. In fact, immediate posttests are considered to show the short-term impact of treatment. According to Schmitt (2010), results from immediate posttests do not necessarily imply learning, but rather they have limitations and will only show "whether the treatment had any effect (e.g. did the process of acquisition begin?, were the target lexical items enhanced in any way?, did learners notice the target items in the treatment?)" (p. 156). Therefore, this study included a delayed posttest which we discuss below in more detail.

### 3.5.3.4 The Delayed posttest

This study was primarily concerned with participants' long-term vocabulary learning and therefore it included a delayed test for all the experimental and control groups. The idea of delayed test was based on Schmitt's (2010) assertion that "only delayed posttests give a true indication of durable learning" (p. 257).

The delayed posttest was administered to all the groups exactly one week after the immediate posttest. Its scheduling was decided relying on Schmitt (2010) who holds that in research a minimum of one week time delay after treatment is necessary if one wants to get useful data from a delayed posttest. Therefore, the purpose of one week delay of the posttest was to gather valid results which would show whether long-term vocabulary learning and retention has taken place among the participants.

The test, as pointed out earlier, was the same as the pretest and the immediate posttest in terms of format and questions included. Same as the other tests, the delayed test lasted thirty minutes for all groups and it was administered in the same premises for the control groups, that is, the same classrooms they had their previous tests and treatment sessions. The experimental groups, on the other hand, took the delayed posttest in regular classrooms this time as there was no need to have them in the Computer Lab. Namely, the IBU experimental group took the test in one of the IBU regular classrooms in Skopje, whereas the SEEU experimental group took the test in one of the SEEU regular classrooms in the Skopje campus. The test was administered successfully to all groups without any delays or problems.

### 3.5.3.5 The Questionnaire and self-reflection papers

The questionnaire was completed by all experimental group participants and it was administered as soon as they were done with the immediate posttest in the same university premises. Firstly, students were kindly asked to fill out the questionnaire that was going to be provided to them and were told to express their attitudes and views on the overall sessions, corpora, and DDL, by circling/marking the most appropriate option to them. After they received their questionnaires, the instructor provided some guidance on the overall questions and statements included in the questionnaire. After the instructor ensured that every participant understood the instructions, students started filling out the questionnaire. There was no time limit for its completion and it ended when every single participant was finished with it. The instructor, moved around the class during the questionnaire to ensure he provided assistance (explanations) if necessary. The overall process was completed successfully without any major problem.

After the questionnaire was completed, only some randomly selected participants of the experimental groups were asked to write a self-reflection paper on their experience with corpus and DDL. These participants, however, were initially asked if they were willing to write the paper before it was given to them and all of them agreed to participate in writing it. These included seven participants from the IBU experimental group and three participants from the SEEU experimental group. At the beginning, these students were initially informed of the purpose of the self-reflection paper. Namely, they were told that it aimed to have them expand on their experience with corpora and DDL. In addition, they were instructed to use the guiding questions as a help in writing the paper as well as to feel free to provide additional remarks on their corpus investigation experience and learning new vocabulary with the help of corpus. The participants then proceeded with their writing and there was no time limit for its completion, which means the instructor waited until everyone submitted his/her paper. The overall process was completed successfully without any major problem.

### 3.5.4 Data analysis

In this section, we discuss the methodology of data analysis of the data collected from the research instruments used in the study. The analyses for each instrument will be discussed separately in the following sections.

### 3.5.4.1 The Questionnaire results analysis

The questionnaire responses from the experimental group were processed with *SPSS 22*. Firstly, all variables were added into the software and then each label (i.e. each response in the questionnaire) was given a numerical value (e.g. *strongly agree* was given the numeric value 1) in order for the software to recognize the responses numerically. Numerical values ranged from 1 to 5 which corresponded to the range of questions, e.g. from *very hard* to *very easy*. Afterwards, the data from the questionnaire, i.e. the participants' responses, were added into SPSS in numerical values from 1 to 5, depending on which response the participants marked or circled in each question and statement of the questionnaire.

After all the responses from the questionnaire were inserted into the software, a descriptive statistics was used to process the data. The questionnaire results were set to be inserted in bar charts and percentages rather than based on number of respondents. After *SPSS* provided valid statistics on the questionnaire, the same were then analyzed in terms of frequency. We discuss these statistics in more detail in the *Results* chapter that follows.

#### 3.5.4.2 Test results analysis

After all the test scores were calculated and were available for analysis, a statistical analysis procedure was used to do an in-depth analysis of the test scores. As with the questionnaire data, *SPSS 22* was used to process the data gathered from the tests.

The insertion of the test data into *SPSS* was done in three separate files. One SPSS data file was created only for the experimental group tests scores, whereas another file was made only for the control group. And lastly, a separate file was created by including all groups' test scores in one file. The purpose of having separate test score files was to make test score analyses possible for each group independently. The *SPSS* file with all groups' test scores, on the other hand, was created so the scores of both the experimental and control groups could be analyzed contrastively.

The process of inserting the experimental group test scores in the *SPSS* was done directly, without using another program, such as Excel. Firstly, the labels were added, such as *Students* and all tests and test score categories we discussed earlier in section *3.4.1.2*. These included: Overall points of pretest; Overall points of posttest; Overall points of delayed test; Overall Vocabulary Knowledge – pretest; Overall Vocabulary Knowledge – posttest; Overall Vocabulary Knowledge – posttest; Receptive Vocabulary Knowledge – pretest; Productive Vocabulary Knowledge – posttest; Productive Vocabulary Knowledge – delayed test. These categories were added in order to include scores of all aspects of vocabulary knowledge in each test (pretest, posttest, and delayed test). After that, all names of the experimental group participants were inserted under the label *Students*, while under each test score category we have mentioned above, the participants' actual scores were imported from the tests. The same procedure was used to import the control group scores. As for the combined file, the procedure was simpler because it was done by copying and pasting the data from each file into one single file. The only difference for this file was that we had to

label the control group as *Group 1* while the experimental group as *Group 2* for statistical purposes.

The statistical data was obtained by running two types of *SPSS* data analyses: a Paired Samples T-test and an Independent-Samples T-Test. The former was used to analyze groups individually. For instance, the Paired Samples T-test was used with the control group test scores to compare the means of scores of the pretest and the posttest and then those of the posttest and the delayed test. This was done to investigate post-treatment immediate gains (by comparing the means of scores of the pretest and the posttest) and retention (by comparing the means of scores of the pretest and the posttest) and retention (by comparing the means of scores of the delayed) in terms of statistical significance. The same was done with the experimental group test scores. The Independent-Samples T-Test, on the other hand, was used to investigate the scores of the groups comparatively. The T-Test was used to analyze all test scores of both groups contrastively. What follows is an illustration of statistical data analysis of the test scores:

## Receptive Vocabulary Knowledge

The control group (Paired Samples T-test) The experimental group (Paired Samples T-test) Both groups (Independent-Samples T-Test)

Figure 3.7 Statistical data analysis of test scores in terms of receptive vocabulary knowledge

In order to decide the statistical significance between two means of scores, both the *p*-value and *t*-statistic were used. A difference between two means of scores was considered significant only if the *p*-value was less than 0.05. Similarly, a difference between two means of scores was considered significant only if *t*-statistics in absolute value showed greater than the critical value 2. Both values were used to evaluate the significance or insignificance of differences between means of scores.

The analysis of the test scores was also done in four stages and it was based on four categories we have mentioned earlier: overall test scores, overall vocabulary knowledge, receptive

vocabulary knowledge, and productive vocabulary knowledge. The procedures with a Paired Samples T-test and an Independent-Samples T-Test we have just discussed were repeated and applied in each of these categories.

After all these analyses were completed, a *one-way Anova* test was also run in the *SPSS* including the test scores of both the experimental and the control group. The purpose was to carry out an additional analysis to the ones mentioned in this section as well as to extract more inclusive results concerning the differences between the means of scores of both groups in all tests and categories. In the following chapter, we discuss the test scores in more detail.

### 3.5.4.3 Self-reflection papers analysis

The self-reflection papers were initially read and examined carefully. Afterwards, what was said by the participants was categorized into subtopics. For instance, some categories included: "views on DDL", "views on corpus as a learning tool; "views on the examples and their usefulness in the corpus", and so on. These categories were then arranged in a single file in which subtopics were organized in columns under which all remarks given around each subtopic were listed below. In that case, a list of all comments for a particular subtopic was available in one single column. Some of these categories had more remarks, while some others had fewer. There were also comments on very specific aspects of DDL and learning new words with corpora and which could not be grouped into the other subtopics. These were analyzed individually and separately from others. The analysis of the remarks was done starting from the most frequently discussed subtopics to the least ones.

# 4. RESULTS

### **4.1 TEST RESULTS**

In this section a detailed statistical analysis of the test results is given. The statistical data was obtained using *SPSS 22* in which two tests were run: Paired Samples T-test and Independent-Samples T-Test. The former was used to analyze groups separately, while the later was used to investigate the results of the groups comparatively. What follows is an outline of test results and ways they will be presented and discussed in this section:

### **Overall test scores**

- The control group (Paired Samples T-test)
- The experimental group (Paired Samples T-test)
- Both groups (Independent-Samples T-Test)

### Overall Vocabulary Knowledge

- The control group (Paired Samples T-test)
- The experimental group (Paired Samples T-test)
- Both groups (Independent-Samples T-Test)

### Receptive Vocabulary Knowledge

- The control group (Paired Samples T-test)
- The experimental group (Paired Samples T-test)
- Both groups (Independent-Samples T-Test)

## Productive Vocabulary Knowledge

- The control group (Paired Samples T-test)
- The experimental group (Paired Samples T-test)
- Both groups (Independent-Samples T-Test)

# 4.1.1 Overall Test Scores

## 4.1.1.1 Overall Test Scores – Control Group

In terms of overall test scores, a Paired Samples T-test was used to compare the means of scores of the control group in the pretest, posttest and delayed test in order to see if there are any statistically significant differences. As *Table 4.1* below shows, the control group scored significantly low in the pretest (Mean: 17.36) which translates into participants' preliminary low performance in the pretest, i.e. in the pre-treatment phase.

	Mean	N	Std. Deviation	Std. Error Mean					
Overall points of pretest	17.36	28	11.998	2.267					
Overall points of posttest	54.71	28	16.713	3.158					
Overall points of posttest	54.71	28	16.713	3.158					
Overall points of delayed test	46.64	28	16.901	3.194					

**Paired Samples Statistics** 

Table 4.1 Paired Sam	ples Statistics:	Overall Points o	of the Test -	Control Group

		Paired Differe							
	Mean	Std. Deviation	Std. Error Mean						
Pair 1 Overall points of pretest Overall points of posttest	-37.357	12.010	2.270	-16.459	27	.000			
Pair 2 Overall points of posttest Overall points of delayed test	8.071	9.253	1.749	4.616	27	.000			

### Paired Samples Test

#### Table 4.2 Paired Samples Test: Overall Points of the Test - Control Group

The mean of scores in the posttest, however, shows a significant progress compared to the pretest figures (*Table 4.1* Pair 1). As *Table 4.2* indicates, the test statistics is 16.459, which is significantly greater than the critical value 2. Moreover, the p-value is .000, which is significantly lower than 0.05 and this confirms the highly significant differences between the

means of scores in the pretest and the posttest. This, in turn, point to considerable posttreatment gains.

A pair analysis of means of scores in the post-test and the delayed test (see *Table 4.1* - Pair 2) also demonstrates a difference, with the latter showing a significant drop. As shown in *Table 4.2*, the test statistics is 4.616, which is significantly greater than the critical value 2. Likewise, the p-value is .000, which is significantly lower than 0.05 and this confirms the important differences between the means of scores in the posttest and the delayed.

To conclude, these statistics indicate that the treatment produced significant immediate (posttest) gains among control group participants. The figures of the delayed test, however, show a statistically significant drop. This suggests that the control group participants did not manage to retain all of the posttest immediate gains.

# 4.1.1.2 Overall Test Scores – Experimental Group

In terms of overall test scores, a Paired Samples T-test was also used to compare the means of scores of the experimental group in the pretest, posttest and delayed test in order to see if there are any statistically significant differences. As *Table 4.3* below shows, the experimental group scored considerably low (Mean: 16.10) in the pretest which translates into participants' initial low performance in the pre-treatment phase.

### Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean
Overall points of pretest	16.10	30	10.739	1.961
Overall points of posttest	63.93	30	17.848	3.259
Overall points of posttest	63.93	30	17.848	3.259
Overall points of delayed test	61.63	30	15.878	2.899

Table 4.3 Paired Samples Statistics: Overall Points of the Test - Experimental Group

Paired Samples Test									
		Paired Differe							
	Mean	Std. Deviation	Std. Error Mean						
Pair 1 Overall points of pretest Overall points of posttest	-47.833	13.552	2.474	-19.332	29	.000			
Pair 2 Overall points of posttest Overall points of delayed test	2.300	6.238	1.139	2.020	29	.053			

Table 4.4 Paired Samples Test: Overall Points of the Test - Experimental Group

However, the mean of scores in the posttest demonstrates a highly significant progress (Mean: 63.93) compared to the mean of scores in the pretest (see *Table 4.3* - Pair 1). As *Table 4.4* indicates, the test statistics is 19.332, which is highly significantly greater than the critical value 2. In addition, the p-value is .000, which confirms the highly significant differences between the means of scores in the pretest and the posttest. The statistical data thus point to considerable post-treatment gains.

A pair analysis of means of scores in the post-test and the delayed test (see *Table 4.3* - Pair 2) also shows a difference, with the latter showing a slight drop. As shown in *Table 4.4*, the p-value is .053, which is slightly higher than 0.05, and this suggest that the differences between the means of scores in the posttest and the delayed test are rather insignificant.

To conclude, the statistics revealed in this section suggest that the treatment produced highly significant immediate (posttest) gains among experimental group participants. The statistics of the delayed test, on the other hand, show a slight drop, but not to say that they are statistically significant. This suggests that the experimental group participants managed to retain most of the post-treatment gains.

# 4.1.1.3 Overall Test Scores – Control and Experimental Group

In terms of overall test results, an Independent-Samples T-Test was used to analyze contrastively the means of scores between the experimental group and the control group in the pretest, posttest and delayed test in order to see if there are any statistically significant differences.

*Table 4.5* shows that means of scores of the control group (17.36) and that of the experimental group (16.10) in the pretest are evidently very similar. Based on the results of the two sample test shown in *Table 4.6* for the overall points of pretest, the test statistic is .421, which confirms the fact that there are no significant differences between means. In other words, we conclude that the means of scores between control and experimental group are not significantly different since the t-statistics in absolute value is not greater than the critical value 2. This also can be tested based on the p-value procedure. The p-value in this case is .675, which is more than 0.05 and this confirms that the difference between means of scores is statistically insignificant.

Group Statistics									
Groups of students	N	Mean	Std. Deviation	Std. Error Mean					
Control	28	17.36	11.998	2.267					
Experimental	30	16.10	10.739	1.961					
Control	28	54.71	16.713	3.158					
Experimental	30	63.93	17.848	3.259					
Control	28	46.64	16.901	3.194					
Experimental	30	61.63	15.878	2.899					

Table 4.5 Group statistics: Overall points of the test – Control & Experimental Group

	Levene's Equal Varia	evene's Test for Equality of Variances		t-test for Equality of Mean			
Equal variances assumed	.987	.325	.421	56	.675	1.257	
Equal variances not assumed			.419	54.241	.677	1.257	
Equal variances assumed	.016	.900	- 2.027	56	.047	-9.219	
Equal variances not assumed			- 2.031	55.999	.047	-9.219	
Equal variances assumed	.347	.558	- 3.483	56	.001	-14.990	
Equal variances not assumed			- 3.475	55.035	.001	-14.990	

### Indonandant Samplas Tast

Table 4.6 Independent Samples Test: Overall points of the test – Control & Experimental Group

Both the control group and the experimental group marked significant gains in the posttest, namely, the control group mean of scores is 54.71 while that of the experimental group is 63.93 (see Table 4.5). It is evident, however, that the latter group scored higher. Based on the results of the two sample test shown in Table 4.6 for the overall points in the posttest, the test statistic is 2.027, which confirms the fact that there is a significant difference between means. In other words, we conclude that the difference between the means of scores between control and experimental group are significant since the t-statistics in absolute value is greater that the critical value 2. This also can be tested based on the p-value procedure. The p-value in this case is .047, which is less than 0.05, and this confirms the significant difference between means of scores.

Group statistics for the overall points of the delayed test, on the other hand, indicate that means of scores of the control group and the experimental group marked a drop compared to the posttest figures. Namely, the control group mean of scores in the delayed test is 46.64 while that of the experimental group is 61.63 (see *Table 4.5*). It is clear form these figures of the delayed test that the differences in scores of groups are now greater and this, as the Paired Samples T-test analyses indicated earlier, is due to the fact that the experimental group marked much slighter and statistically insignificant drop in comparison with the control group which, on the contrary, showed a statistically significant drop. Based on the results of the two sample test shown in *Table 4.6* for the overall points of delayed test, the test statistic is 3.483, which confirms the fact that there is a highly significant difference between means of groups since the t-statistics in absolute value is almost twice as great as the critical value 2. This also can be tested based on the p-value procedure. The p-value in this case is .001 and this confirms the highly significant difference between means of scores.

To summarize, the Independent-Samples T-Test in terms of overall test results show that the means of scores of the control group and the experimental group scored equally low in the pretest. The posttest statistics, however, show considerable gains by both groups, but with the later scoring considerably better. That is to say, the experimental group gained significantly better from the treatment in the immediate posttest. The delayed test figures clearly indicate that the experimental group also managed to retain the posttest gains significantly better compared to the control group.

### 4.1.2 Overall Vocabulary Knowledge

### 4.1.2.1 Overall Vocabulary Knowledge – Control Group

In terms of overall vocabulary knowledge, a Paired Samples T-test was used to compare the means of scores of the control group in the pretest, posttest and delayed test in order to see if there are any statistically significant differences. As *Table 4.7* below shows, the control group scored significantly low in the pretest (Mean: 19.64) which translates into participants' preliminary (pre-treatment) poor knowledge of the overall vocabulary included in the test.

i ance dampies dialistics							
	Mean	Ν	Std. Deviation	Std. Error Mean			
Vocabulary gains & retention - pretest	19.64	28	12.844	2.427			
Vocabulary gains & retention - posttest	62.14	28	16.174	3.057			
Vocabulary gains & retention - posttest	62.14	28	16.174	3.057			
Vocabulary gains & retention - delayed test	53.46	28	17.392	3.287			

**Paired Samples Statistics** 

Table 4.7 Paired Samples Statistics: Overall Vocabulary Knowledge - Control Group

Daired Complee Test

			Std.	Std. Error					
		Mean	Deviation	Mean					
Pair 1	- Vocabulary gains & retention - pretest	-	40.000	0.404	-	7			
	Vocabulary gains & retention - posttest	42.500	12.863	2.431	17.484	27	.000		
Pair 2	Vocabulary gains & retention - posttest	9 670	0 100	1 727	4 007	27	000		
	Vocabulary gains & retention - delayed test	0.079	79 9.190	1.737	4.997	21	.000		
					-				

Table 4.8 Paired Samples Test: Overall Vocabulary Knowledge - Control Group

The mean of scores in the posttest (62.14), however, shows a significant progress compared to the pretest figures (*Table 4.7* - Pair 1). As *Paired Samples Test Table* indicates above, the test statistics is 17.484, which is highly significant and much greater than the critical value 2. Moreover, the p-value is .000, which is significantly lower than 0.05 and this confirms the highly significant differences between the means of scores in the pretest and the posttest. This, in turn, points to considerable, and statistically significant, post-treatment vocabulary gains.

A pair analysis of means of scores in the post-test and the delayed test (see *Table 4.7* - Pair 2) also demonstrates a difference, with the latter showing a significant drop. As shown in *Table 4.8*, the test statistics is 4.997, which is significantly greater than the critical value 2. Likewise, the p-value is .000, which is significantly lower than 0.05 and this confirms the important differences between the means of scores in the posttest and the delayed test.

To conclude, these statistics indicate that the treatment produced significant immediate (posttest) vocabulary gains among control group participants. The figures of the delayed test, however, show a statistically significant drop, which suggest that the control group participants did not manage to retain a considerable amount of the posttest vocabulary gains.

# 4.1.2.2 Overall Vocabulary Knowledge – Experimental Group

In terms of overall vocabulary knowledge, a Paired Samples T-test was used to compare the means of scores of the experimental group in the pretest, posttest and delayed test in order to see if there are any statistically significant differences. As Table 4.9 below shows, the experimental group scored considerably low (Mean: 16.87) in the pretest which translates into participants' preliminary (pre-treatment) poor knowledge of the overall vocabulary included in the test.

Paired Samples Statistics									
	Std. Error Mean								
Vocabulary gains & retention - pretest	16.87	30	11.007	2.010					
Vocabulary gains & retention - post test	66.70	30	16.914	3.088					
Vocabulary gains & retention - post test	66.70	30	16.914	3.088					
Vocabulary gains & retention - delayed test	63.63	30	14.959	2.731					

Table 4.9 Paired Samples Statistics: Overall Vocabulary Knowledge - Experimental Group

Paired	Sample	s Test
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			Paired Differe				
			Std.	Std. Error			
		Mean	Deviation	Mean			
Pair 1	Vocabulary gains & retention - pretest	-	40 700	0.000	-	~	000
	Vocabulary gains & retention - post test	49.833	12.706	2.320	21.481	29	.000
Pair 2	Vocabulary gains & retention - posttest	2.067	7 220	1 220	2 202	20	020
	Vocabulary gains & retention - delayed test	3.067	7.329	1.330	2.292	29	.029

Table 4.10 Paired Samples Test: Overall Vocabulary Knowledge - Experimental Group

However, the mean of scores in the posttest (66.70) demonstrates a highly significant progress compared to the mean of scores in the pretest (see *Table 4.9* - Pair 1). This could be verified with test statistics and p-value. As *Table 4.10* indicates, the test statistics is 21.481, which is highly significant and considerably greater than the critical value 2. In addition, the p-value is .000, which confirms the highly significant differences between the means of scores in the pretest and the posttest. The statistical data thus point to considerable, and statistically significant, post-treatment vocabulary gains.

A pair analysis of means of scores in the post-test and the delayed test (see *Table 4.9* - Pair 2) also shows a difference, with the latter showing a drop. According to the test statistics, the difference of means in this particular case appears to be statistically significant, but not as to say that it is highly significant. As *Table 4.10* indicates, the test statistics is 2.292, which is slightly over the critical value 2. In addition, the p-value is .029, which is lower than 0.05 and this confirms the significance of differences between the means of scores in the posttest and the delayed.

To conclude, the statistics revealed in this section suggest that the treatment produced highly significant immediate gains (in the posttest) among experimental group participants. The mean of scores in the delayed test, on the other hand, mark a significant drop compared to that of the posttest, but does not seem to be highly significant. This suggests that the experimental group participants did not manage to hold all of the post-treatment overall vocabulary gains, but that is not to say the group did not succeed in retaining most of the posttest gains.

### 4.1.2.3 Overall Vocabulary Knowledge – Control and Experimental Group

In terms of overall vocabulary knowledge, an Independent-Samples T-Test was used to analyze contrastively the means of scores between the experimental group and the control group in the

pretest, posttest and delayed test in order to see if there are any statistically significant differences.

*Table 4.11* given below, shows that means of scores of the control group (19.64) and that of the experimental group (16.87) in the pretest are evidently very similar. Based on the results of the two sample test shown in *Table 4.12* for the overall points of pretest, the test statistic is .886, which confirms the fact that there are no statistically significant differences between means. In other words, we conclude that the means of scores between control and experimental group are not significantly different since the t-statistics in absolute value is not greater than the critical value 2. This also can be tested based on the p-value procedure. The p-value in this case is .380, which is more than 0.05, and this confirms that the difference between means of scores is statistically insignificant.

	Groups of students N Mean Std. Deviation Std									
(	Control	28	19.64	12.844	2.427					
l	Experimental	30	16.87	11.007	2.010					
(	Control	28	62.14	16.174	3.057					
I	Experimental	30	66.70	16.914	3.088					
(	Control	28	53.46	17.392	3.287					
	Experimental	30	63.63	14.959	2.731					

**Group Statistics** 

Table 4.11 Group statistics: Overall Vocabulary Knowledge – Control & Experimental Group

	Levene's <sup>-</sup> Equalit Varian	Test for y of ces	t-i	eans		
Equal variances assumed Equal variances not	1.049	.310	.886	56	.380	2.776
assumed			.881	53.358	.382	2.776
Equal variances assumed	.000	.988	- 1.047	56	.300	-4.557
Equal variances not assumed			- 1.049	55.964	.299	-4.557
Equal variances assumed	.372	.544	- 2.392	56	.020	-10.169
Equal variances not assumed			- 2.380	53.437	.021	-10.169

### Independent Samples Test

Table 4.12 Independent Samples Test: Overall Vocabulary Knowledge – Control & Experimental Group

Both the control group and the experimental group marked significant gains in the posttest, namely, the control group mean of scores is 62.14 while that of the experimental group is 66.70 (see *Table 4.11*), with the latter group scoring slightly higher. Based on the results of the two sample test shown in *Table 4.12* for the overall vocabulary knowledge in the posttest, the test statistic is 1.047, which points to the fact that there is no statistically significant difference between means, although the experimental group shows to have scored better. In other words, we conclude that the difference in means of scores between the control and experimental group is insignificant since the t-statistics in absolute value is not greater that the critical value 2. This also can be tested based on the p-value procedure. The p-value in this case is .300, which is more than 0.05, and this confirms the fact that the difference between means of scores is insignificant.

Group statistics for the overall vocabulary knowledge in the delayed test, on the other hand, indicate that the means of scores of the control group and the experimental group marked a drop compared to the posttest figures. Namely, the control group mean of scores in the delayed test is 53.46 while that of the experimental group is 63.63 (see *Table 4.11*). It is clear form these figures of the delayed test that the differences in scores of groups are now greater and this, as the Paired Samples T-test analyses indicated earlier (see *Table 4.8* and *Table 4.10* above), is due to the fact that the experimental group marked a slighter drop in comparison with the control group which, in contrast, showed a more significant drop in scores. Based on the results of the two sample test shown in *Table 4.12* for the overall vocabulary knowledge in the delayed test, the test statistic is 2.392, which confirms the fact that there is a significant difference between means of groups since the t-statistics in absolute value is greater than the critical value 2. This also can be tested based on the p-value procedure. The p-value in this case is .020 and this confirms the significant difference between means of scores.

To summarize, the Independent-Samples T-Test in terms of overall vocabulary knowledge show that the means of scores of the control group and the experimental group indicate equally low in the pretest. The posttest statistics show considerable gains by both groups, but with the experimental group scoring slightly better. That is to say, the experimental group marked better vocabulary gains from the treatment in the immediate posttest, but as the t-statistics show, the difference does not show to be significant. The delayed test figures, however, clearly indicate that the experimental group managed to retain the posttest vocabulary gains significantly better compared to the control group.

# 4.1.3 Receptive Vocabulary Knowledge

# 4.1.3.1 Receptive Vocabulary Knowledge – Control Group

In terms of receptive vocabulary knowledge, a Paired Samples T-test was used to compare the means of scores of the control group in the pretest, posttest and delayed test in order to see if there are any statistically significant differences. As Table 4.13 below shows, the control group scored significantly low in the pretest (Mean: 26.68) which translates into participants' preliminary (pre-treatment) poor receptive knowledge of the vocabulary included in the study.

Faired Samples Statistics									
		Mean	N	Std. Deviation	Std. Error Mean				
	Receptive Vocabulary Knowledge- pretest	26.68	28	19.156	3.620				
	Receptive Vocabulary Knowledge- posttest	64.71	28	23.191	4.383				
	Receptive Vocabulary Knowledge- posttest	64.71	28	23.191	4.383				
	Receptive Vocabulary Knowledge- delayed test	61.04	28	24.341	4.600				

Table 4.13 Paired Samples Statistics: Receptive Vocabulary Knowledge- Control Group

# **Paired Samples Test**

-		F	Paired Differe				
		Std. Std. Error					
		Mean	Deviation	Mean			
Pair 1	Receptive Vocabulary Knowledge- pretest	-	40.700	0.400	-	07	
	Receptive Vocabulary Knowledge- posttest	38.036	16.732	3.162	12.029	27	.000
Pair 2	Receptive Vocabulary Knowledge- posttest	2 670	6 450	1 210	2 0 1 7	77	006
	Receptive Vocabulary Knowledge- delayed test	3.079	0.432	1.219	3.017	21	.006

Table 4.14 Paired Samples Test: Receptive Vocabulary Knowledge- Control Group

The mean of scores in the posttest (64.71), however, shows highly significant gains compared to the pretest figures (Table 4.13 - Pair 1). As Paired Samples Test in Table 4.14 indicates above, the test statistics is 12.029, which is highly significant and far greater than the critical value 2. Moreover, the p-value is .000, which is significantly lower than 0.05 and this confirms the highly significant differences between the means of scores in the pretest and the posttest. This, in turn, points to highly significant receptive vocabulary knowledge improvements in the immediate post-treatment phase.

A pair analysis of means of scores in the post-test and the delayed test (see *Table 4.13* - Pair 2) also demonstrates a difference, with the latter showing a slight drop (61.04). As shown in *Table 4.14*, the test statistics is 3.017, which is slightly greater than the critical value 2, and this signals a significant (but not to suggest that it is a highly significant) drop in the mean of scores in the posttest. Likewise, the p-value is .006, which is significantly lower than 0.05 and this confirms the important differences between the means of scores in the posttest and the delayed.

To conclude, these statistics indicate that the treatment led to considerable receptive vocabulary knowledge improvements among control group participants in the immediate post-treatment phase, i.e. in the posttest. The figures of the delayed test, on the other hand, mark a significant drop compared to that of the posttest, but does not seem to be highly significant. This suggests that the control group participants did not manage to hold all of the post-treatment receptive vocabulary knowledge gains, but that is not to say the group did not succeed in retaining most of the posttest gains.

# 4.1.3.2 Receptive Vocabulary Knowledge – Experimental Group

In terms of receptive vocabulary knowledge, a Paired Samples T-test was used to compare the means of scores of the experimental group in the pretest, posttest and delayed test in order to see if there are any statistically significant differences. As *Table 4.15* below shows, the experimental group scored considerably low (Mean: 21.20) in the pretest which translates into participants' preliminary (pre-treatment) poor receptive knowledge of the vocabulary included in the study.

i aned bamples blatistics								
	Mean	Ν	Std. Deviation	Std. Error Mean				
Receptive Vocabulary Knowledge- pretest	21.20	30	14.050	2.565				
Receptive Vocabulary Knowledge- posttest	72.13	30	18.235	3.329				
Receptive Vocabulary Knowledge- posttest	72.13	30	18.235	3.329				
Receptive Vocabulary Knowledge- delayed test	74.70	30	15.650	2.857				

**Paired Samples Statistics** 

Table 4.15 Paired Samples Statistics: Receptive Vocabulary Knowledge- Experimental Group

#### Paired Samples Test

			Paired Differe				
			Std.	Std. Error			
		Mean	Deviation	Mean			
Pair 1	- Receptive Vocabulary Knowledge- pretest	-	14.951	0.711	-	20	000
	Receptive Vocabulary Knowledge- posttest	50.933	14.001	2.711	18.785	29	.000
Pair 2	Receptive Vocabulary Knowledge- posttest	-2.567	8.577	1.566	-1.639	29	.112
	Receptive Vocabulary Knowledge- delayed test	2.001	0.011		1.000		

Table 4.16 Paired Samples Test: Receptive Vocabulary Knowledge- Experimental Group

However, the mean of scores in the posttest (72.13) demonstrates a highly significant progress compared to the mean of scores in the pretest (see *Table 4.15* - Pair 1). This could be verified with test statistics and p-value. As *Table 4.16* indicates, the test statistics is 18.785, which is highly significant and considerably greater than the critical value 2. In addition, the p-value is .000, which confirms the highly significant differences between the means of scores in the pretest and the posttest. The statistical data thus point to considerable or highly significant group participants.

A pair analysis of means of scores in the post-test and the delayed test (see *Table 4.15* - Pair 2) also shows a difference, with the latter showing a slight rise. According to the test statistics, the difference of means in this particular case appears to be statistically insignificant. As *Table 4.16* indicates, the test statistics is 1.639, which is below the critical value 2. In addition, the p-value

is .112, which is over 0.05 and this confirms the fact that the differences between the means of scores in the posttest and the delayed are rather insignificant.

In summary, the statistics revealed in this section suggest that the treatment produced highly significant receptive vocabulary knowledge gains among the experimental group participants in the immediate test (posttest). The mean of scores in the delayed test, on the other hand, marks a slight rise compared to that of the posttest, but does not appear to be statistically significant. This suggests that the experimental group participants managed not only to retain all of the post-treatment receptive vocabulary but also to slightly develop the posttest gains as the delayed test figures demonstrate.

### 4.1.3.3 Receptive Vocabulary Knowledge – Control and Experimental Group

In terms of receptive vocabulary knowledge, an Independent-Samples T-Test was used to analyze contrastively the means of scores between the control group and the experimental group in the pretest, posttest and delayed test in order to see if there are any statistically significant differences.

*Table 4.17* given below, shows that the means of scores of the control group (26.68) and that of the experimental group (21.20) in the pretest are evidently not very different. Based on the results of the two sample test shown in *Table 4.18* below, the test statistic is 1.248, which confirms the fact that there are no statistically significant differences between means. In other words, we conclude that the difference between the mean of scores of the control group and that of the experimental group is not statistically significant since the t-statistics in absolute value is not greater than the critical value 2. This also can be tested based on the p-value procedure. The p-value in this case is .217, which is not less than 0.05, and this confirms that the difference between means of scores is trivial.
Group Statistics									
Groups of students	N	Mean	Std. Deviation	Std. Error Mean					
Control	28	26.68	19.156	3.620					
Experimental	30	21.20	14.050	2.565					
Control	28	64.71	23.191	4.383					
Experimental	30	72.13	18.235	3.329					
Control	28	61.04	24.341	4.600					
Experimental	30	74.70	15.650	2.857					

Table 4.17 Group statistics: Receptive Vocabulary Knowledge– Control & Experimental Group

	Levene's <sup>-</sup> Equalit Varian	Test for y of ces	t-test for Equality of Means			leans
Equal variances assumed	3.842	.055	1.248	56	.217	5.479
Equal variances not assumed			1.235	49.339	.223	5.479
Equal variances assumed	1.478	.229	- 1.359	56	.180	-7.419
Equal variances not assumed			- 1.348	51.260	.184	-7.419
Equal variances assumed	6.314	.015	- 2.560	56	.013	-13.664
Equal variances not assumed			- 2.523	45.541	.015	-13.664

### Independent Samples Test

Table 4.18 Independent Samples Test: Receptive Vocabulary Knowledge- Control & Experimental Group

Both the control group and the experimental group marked significant gains in the posttest. Namely, the control group mean of scores is 64.71 while that of the experimental group is 72.13 (see *Table 4.17*), with the latter group marking a higher score. Based on the results of the two sample test shown in *Table 4.18* for the receptive vocabulary knowledge in the posttest, the test

statistic is 1.359, which points to the fact that there is no statistically significant difference between means, although the experimental group shows to have scored better. In other words, we conclude that the difference in means of scores between the control and the experimental group is insignificant in this case since the t-statistics in absolute value is not greater that the critical value 2. This also can be tested based on the p-value procedure. The p-value in this case is .180, which is more than 0.05, and this confirms the fact that the difference between means of scores is insignificant.

Group statistics for the receptive vocabulary knowledge in the delayed test, on the other hand, indicate that the mean of scores of the control group marked a drop in contrast to the experimental group which marked a very slight rise. Namely, the control group mean of scores in the delayed test is 61.04 while that of the experimental group is 74.70 (see *Table 4.17*). It is clear form these figures of the delayed test that the differences in scores of groups are now greater and this, as the Paired Samples T-test analyses indicated earlier (see *Table 4.14* and *Table 4.16* above), is due to the fact that the experimental group marked a slight rise in comparison with the control group which, in contrast, marked a drop in scores. Based on the results of the two sample test shown in *Table 4.18* for the receptive vocabulary knowledge in the delayed test, the test statistic is 2.560, which confirms the fact that there is a significant difference between the means of groups since the t-statistics in absolute value is greater than the critical value 2. This also can be tested based on the p-value procedure. The p-value in this case is .013, which is lower than 0.05 and this confirms the significant difference between means of scores.

To summarize, the Independent-Samples T-Test in terms of receptive vocabulary knowledge shows that the means of the control group and the experimental group indicate equally low scores in the pretest. The posttest statistics show considerable gains by both groups, but with the experimental group scoring slightly better. That is to say, the experimental group marked better receptive vocabulary knowledge gains from the treatment in the immediate posttest, but as the t-statistics signal, the difference does not appear to be significant. The delayed test figures, however, clearly indicate that the experimental group managed to retain the posttest receptive vocabulary knowledge gains significantly better in contrast to the control group that lost statistically significant amount of gains.

## 4.1.4 Productive Vocabulary Knowledge

## 4.1.4.1 Productive Vocabulary Knowledge – Control Group

In terms of productive vocabulary knowledge, a Paired Samples T-test was used to compare the means of scores of the control group in the pretest, posttest and delayed test in order to see if there are any statistically significant differences. As *Table 4.19* below shows, the control group scored significantly low in the pretest (Mean: 11.89) which translates into participants' preliminary (pre-treatment) poor productive knowledge of the vocabulary included in the study.

	Mean	N	Std. Deviation	Std. Error Mean				
Productive Vocabulary Knowledge- pretest	11.89	28	9.927	1.876				
Productive Vocabulary Knowledge- posttest	44.29	28	17.007	3.214				
Productive Vocabulary Knowledge- posttest	44.29	28	17.007	3.214				
Productive Vocabulary Knowledge- delayed test	35.29	28	17.053	3.223				

### **Paired Samples Statistics**

 Table 4.19 Paired Samples Statistics: Productive Vocabulary Knowledge- Control Group

#### **Paired Samples Test**

		F	aired Differe				
			Std.	Std. Error			
		Mean	Deviation	Mean			
Pair 1	Productive Vocabulary Knowledge- pretest	-	40.000	0.575	-	07	000
	Productive Vocabulary Knowledge- posttest	32.393	13.628	2.575	12.577	21	.000
Pair 2	Productive Vocabulary Knowledge- posttest	0.000	10.265	2 2 2 7	2 952	27	001
	Productive Vocabulary Knowledge- delayed test	9.000	12.305	2.337	3.652	21	.001

Table 4.20 Paired Samples Test: Productive Vocabulary Knowledge- Control Group

The mean of scores in the posttest (44.29), however, shows highly significant gains compared to the pretest figures (*Table 4.19* - Pair 1). As *Paired Samples Test Table 4.20* indicates above, the test statistics is 12.577, which is highly significant and far greater than the critical value 2. Moreover, the p-value is .000, which is significantly lower than 0.05 and this confirms the highly significant differences between the means of scores in the pretest and the posttest. This, in turn, points to highly significant productive vocabulary knowledge improvements in the immediate post-treatment phase.

A pair analysis of means of scores in the post-test and the delayed test (see *Table 4.19* - Pair 2) also demonstrates a difference, with the latter showing a drop (35.29). As shown in *Table 4.20*, the test statistics is 3.852, which is greater than the critical value 2 and this signals a significant (but not to suggest that it is a highly significant) drop in the mean of scores in the posttest. Likewise, the p-value is .001, which is significantly lower than 0.05 and this confirms the important differences between the means of scores in the posttest and the delayed.

To conclude, the statistics in this section indicate that the treatment led to considerable productive vocabulary knowledge improvements among control group participants in the immediate post-treatment phase, i.e. in the posttest. The figures of the delayed test, on the other hand, mark a significant drop compared to that of the posttest, but do not seem to be highly significant. This suggests that the control group participants did not manage to hold all of the post-treatment productive vocabulary knowledge gains, but that is not to say the group did not succeed in retaining most of the posttest gains.

## 4.1.4.2 Productive Vocabulary Knowledge – Experimental Group

In terms of productive vocabulary knowledge, a Paired Samples T-test was used to compare the means of scores of the experimental group in the pretest, posttest and delayed test in order to

see if there are any statistically significant differences. As *Table 4.21* below shows, the experimental group scored considerably low (Mean: 12.33) in the pretest which translates into participants' preliminary (pre-treatment) poor productive knowledge of the vocabulary included in the study.

Paired Samples Statistics									
		Mean	Ν	Std. Deviation	Std. Error Mean				
P	roductive Vocabulary Knowledge- pretest	12.33	30	10.506	1.918				
Р	roductive Vocabulary Knowledge- posttest	58.63	30	19.577	3.574				
Р	roductive Vocabulary Knowledge- posttest	58.63	30	19.577	3.574				
Р	roductive Vocabulary Knowledge- delayed test	55.03	30	18.195	3.322				

Table 4.21 Paired Samples Statistics: Productive Vocabulary Knowledge- Experimental Group

### Paired Samples Test

		F	aired Differe				
			Std.	Std. Error			
		Mean	Deviation	Mean			
Pair 1	Productive Vocabulary Knowledge- pretest	-	40.404	0.054	-	00	000
	Productive Vocabulary Knowledge- posttest	46.300	16.161	2.951	15.692	29	.000
Pair 2	Productive Vocabulary Knowledge- posttest	2 600	7 500	1 260	2 6 2 0	20	014
	Productive Vocabulary Knowledge- delayed test	3.600	7.500	1.309	2.629	29	.014

Table 4.22 Paired Samples Test: Productive Vocabulary Knowledge- Experimental Group

However, the mean of scores in the posttest (58.63) demonstrates a highly significant progress compared to the mean of scores in the pretest (see *Table 4.21* - Pair 1). This could be verified with test statistics and p-value. As *Table 4.22* indicates, the test statistics is 15.692, which is highly significant and considerably greater than the critical value 2. In addition, the p-value is .000, which confirms the highly significant differences between the means of scores in the pretest and the posttest. The statistical data thus point to considerable or highly significant post-treatment productive vocabulary knowledge gains among the experimental group participants.

A pair analysis of means of scores in the post-test and the delayed test (see *Table 4.21* - Pair 2) also shows a difference, with the latter showing a drop. According to the test statistics, the difference of means in this particular case appears to be statistically significant, but does not seem to be highly significant. As *Table 4.22* indicates, the test statistics is 2.629, which is slightly over the critical value 2. In addition, the p-value is .014, which is lower than 0.05 and this confirms the significance of differences between the means of scores in the posttest and the delayed test.

To conclude, the statistics revealed in this section suggest that the treatment produced highly significant immediate gains (in the posttest) among experimental group participants. The mean of scores in the delayed test, on the other hand, mark a significant drop compared to that of the posttest, but does not seem to be highly significant. This suggests that the experimental group participants did not manage to hold all of the post-treatment overall vocabulary gains, but that is not to say the group did not succeed in retaining most of the posttest gains.

# 4.1.4.3 Productive Vocabulary Knowledge – Control and Experimental Group

In terms of productive vocabulary knowledge, an Independent-Samples T-Test was used to analyze contrastively the means of scores between the control group and the experimental group in the pretest, posttest and delayed test in order to see if there are any statistically significant differences.

Table 4.23 given below, shows that the means of scores of the control group (11.89) and that of the experimental group (12.33) in the pretest are evidently very similar. Based on the results of the two sample test shown in *Table 4.24* below, the test statistic is .164, which confirms the fact that there are no statistically significant differences between means. In other words, we conclude that the difference between the mean of scores of the control group and that of the experimental group is not statistically significant since the t-statistics in absolute value is not

greater than the critical value 2. This also can be tested based on the p-value procedure. The p-value in this case is .870, which is significantly greater than 0.05 and this confirms that the difference between means of scores is trivial.

Group Statistics									
Groups of students	Ν	Mean	Std. Deviation	Std. Error Mean					
Control	28	11.89	9.927	1.876					
Experimental	30	12.33	10.506	1.918					
Control	28	44.29	17.007	3.214					
Experimental	30	58.63	19.577	3.574					
Control	28	35.29	17.053	3.223					
Experimental	30	55.03	18.195	3.322					

Table 4.23 Group statistics: Productive Vocabulary Knowledge– Control & Experimental Group

Independent Samples Test									
	Levene's Equal Varia	Test for ity of nces	t-1	est for E	Equality of M	eans			
Equal variances assumed	.216	.644	164	56	.870	440			
Equal variances not assumed			164	55.990	.870	440			
Equal variances assumed	.056	.814	- 2.970	56	.004	-14.348			
Equal variances not assumed			- 2.985	55.726	.004	-14.348			
Equal variances assumed	.033	.856	- 4.257	56	.000	-19.748			
Equal variances not assumed			- 4.267	55.998	.000	-19.748			

Independent Samples Test

Table 4.24 Independent Samples Test: Productive Vocabulary Knowledge- Control & Experimental Group

Both the control group and the experimental group marked significant gains in the posttest. Namely, the control group mean of scores is 44.29 while that of the experimental group is 58.63 (see *Table 4.23*), with the latter group marking a higher score. Based on the results of the two sample test shown in *Table 4.24* for the productive vocabulary knowledge in the posttest, the test statistic is 2.970, which points to the fact that there is statistically significant difference between means in the posttest. In other words, we conclude that the difference in means of scores between the control and the experimental group is significant since the t-statistics in absolute value is greater that the critical value 2. This also can be tested based on the p-value procedure. The p-value in this case is .004, which is less than 0.05, and this confirms the fact that the difference between means of scores is significant.

Group statistics for the productive vocabulary knowledge in the delayed test, on the other hand, indicate that the means of scores of both the control group as well as the experimental group mark a drop. Namely, the mean of scores of the control group in the delayed test is 35.29 while that of the experimental group is 55.03 (see *Table 4.23*). It is clear form these figures of the delayed test that the difference in means of scores between the groups is now greater and this, as the figures themselves suggest, is due to the fact that the experimental group marked a slighter drop in comparison with the control group which, in contrast, marked a more significant drop in scores. Based on the results of the two sample test shown in *Table 4.24* for the productive vocabulary knowledge in the delayed test, the test statistic is 4.257, which confirms the fact that there is a significant difference between the means of groups since the t-statistics in absolute value is twice greater than the critical value 2. This also can be tested based on the p-value procedure. The p-value in this case is .000, which is far lower than 0.05 and this confirms the highly significant difference between means of scores.

To summarize, the Independent-Samples T-Test in terms of productive vocabulary knowledge show that the means of the control group and the experimental group indicate equally low scores in the pretest. The posttest statistics show considerable gains by both groups, but with the experimental group scoring significantly better. That is to say, the experimental group marked better productive vocabulary knowledge gains from the treatment in the immediate posttest, and as the t-statistics signal, the difference does appear to be significant. The delayed

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test figures, on the other hand, clearly indicate that the experimental group managed to retain the posttest productive vocabulary knowledge gains significantly better in contrast to the control group.

# 4.1.5 One-way Anova analysis

In addition to the Samples T-test and Independent-Samples T-Test, a one-way Anova test with *SPSS* of the means of scores was carried out to confirm the statistics discussed so far. *Table 4.25* given below provides a complete overview and a more comprehensive picture of all test score categories mentioned earlier. In order to avoid repetition, these results will not be analyzed as this has been already done in the past sections.

		Sum of Squares	df	Mean Square	F	Sia.
Overall points of pretest	Between Groups	22.889	1	22.889	.177	.675
	Within Groups	7231.129	56	129.127		
	Total	7254.017	57			
Overall points of post test	Between Groups	1230.902	1	1230.902	4.108	.047
	Within Groups	16779.581	56	299.635		
	Total	18010.483	57			
Overall points of delayed	Between Groups	3254.484	1	3254.484	12.131	.001
test	Within Groups	15023.395	56	268.275		
	Total	18277.879	57			
Vocabulary gains and	Between Groups	111.622	1	111.622	.785	.380
retention - pretest	Within Groups	7967.895	56	142.284		
	Total	8079.517	57			
Vocabulary gains and	Between Groups	300.771	1	300.771	1.097	.300
retention - post test	Within Groups	15359.729	56	274.281		
	Total	15660.500	57			
Vocabulary gains and retention - delayed test	Between Groups	1497.655	1	1497.655	5.723	.020
	Within Groups	14655.931	56	261.713		
	Total	16153.586	57			
Receptive knowledge of	Between Groups	434.696	1	434.696	1.557	.217
vocabulary - pretest	Within Groups	15632.907	56	279.159		
	Total	16067.603	57			
Receptive knowledge of	Between Groups	797.164	1	797.164	1.847	.180
vocabulary - post test	Within Groups	24165.181	56	431.521		
	Total	24962.345	57			
Receptive knowledge of	Between Groups	2704.115	1	2704.115	6.556	.013
vocabulary - delayed test	Within Groups	23099.264	56	412.487		
	Total	25803.379	57			
Productive knowledge of	Between Groups	2.810	1	2.810	.027	.870
vocabulary - pretest	Within Groups	5861.345	56	104.667		
	Total	5864.155	57			
Productive knowledge of	Between Groups	2981.336	1	2981.336	8.822	.004
vocabulary - post test	Within Groups	18924.681	56	337.941		
	Total	21906.017	57			
Productive knowledge of	Between Groups	5647.819	1	5647.819	18.122	.000
vocabulary - delayed test	Within Groups	17452.681	56	311.655		
	Total	23100.500	57			

Table 4.25 One-way Anova: All test score categories – Control & Experimental Group

## **4.2 FREQUENCY ANALYSIS OF THE QUESTIONNAIRE**

In this section, we discuss questionnaire results which consisted of two kinds: four rating scale questions ranging from 'very easy' to 'very difficult'; and sixteen Likert questions ranging on a scale from 'strongly agree' to 'strongly disagree'. The data will be interpreted using bar charts while responses will be interpreted with percentages rather than based on number of respondents. The participants' responses were processed with *SPSS 22* and the results extracted as bar charts.

## 4.2.1 Rating scale questionnaire results

According to the responses in the questionnaire, participants generally found the corpus, i.e. *IntelliText* and its interface, as well as exploring words with affixes with the corpus either an easy or very easy task. As *Chart 4.1* below shows, just over 50% of participants responded 'easy', while about 45% of participants responded 'very easy' when asked to rate the level of difficulty they encountered. Only a small percentage of respondents found the software and finding words with affixes to be at medium difficulty.



How would you rate the difficulty of using the corpus (IntelliText) to search words with prefixes / suffixes?

Chart 4.1 Students' views on the difficulty of using the corpus to explore words with affixes

In contrast to exploring the corpus for words with affixes, the responses from the questionnaire indicate that not all participants were confident when it comes to inferring meaning of words from the concordance lines (without a dictionary). Almost half of the respondents rated it as a medium difficulty. Nevertheless, this is not to say that participants found inferring meaning from context a very difficult task since, as the chart (*Chart 4.2*) below indicates, there was no participant to have found it difficult or very difficult. The rest of the respondents found inferring meaning from context as either an easy or a very easy task.



Chart 4.2 Students' views on the difficulty of inferring the meaning of words from concordance lines (without a dictionary)

The questionnaire reveals mixed results in terms of how participants view the level of English found in the concordance lines. As the bar chart (*Chart 4.3*) below reveals, most of the respondents found the language in the corpus to be between easy and medium difficulty; that is, 60% found it to be easy, while roughly 35% of the respondents considered it to be medium difficult. These mixed results correspond to the fact that participants in the study, as pointed out in the previous chapter, were of various level of language proficiency and hence perceived the level of language in the corpus differently.



How would you rate the difficulty of English (the difficulty of language used) in the corpus?

Chart 4.3 Learners' perception of the level (difficulty) of English in the corpus

As far as the method (learning vocabulary with corpus/technology) is concerned, most of participants in the experimental did not find it difficult. The frequency analysis (see Chart 4.4 below) indicates that almost 90% of the respondents found the method to be either very easy or easy, while roughly 1/10 of the respondent felt it was medium difficult.

These results appear to be similar to the ones related to the difficulty of handling the software and finding words with affixes discussed at the beginning of this section (Chart 4.1). Thus, it is reasonable to claim that the participants did not face any particular difficulties either with the tasks of exploring new words with affixes in the corpus or with the method, which included teaching and learning new words with the help of corpus. In contrast to these conclusions, however, participants claim to have had some difficulties (see Chart 4.2) when asked to infer meaning of words directly from the concordance lines, although the responses do not suggest that the participants found the task highly demanding.



Chart 4.4 Learners' views on the level of difficulty of the method (learning vocabulary with a the corpus)

# 4.2.2 Likert scale questionnaire results

The questionnaire responses show that students had a positive attitude towards corpus as a learning tool. As *Chart 4.5* below clearly indicates, the vast majority of respondents, that is 80%, strongly agreed, in addition to 18% who agreed, with the statement: "I like corpus as a language learning tool (device)". In addition, the figures do not show any respondents to have disliked the tool as no negative response was given. Only a very small percentage, hence statistically insignificant number, of respondents felt uncertain or neutral with this statement.



Chart 4.5 Students' attitudes towards the corpus as a learning tool

The questionnaire responses point to the fact that participants in the experimental group felt the training session, offered prior to the treatment period, was useful for the purpose of exploring and learning word parts. According to the data given in *Chart 4.6* below, all the respondents either strongly agreed or agreed with: "The corpus training in the Computer Lab helped me learn how to search and find words with affixes". That is, just over 80% of the respondents strongly agreed with the statement, while the remaining 20% agreed. There was no student who felt that the training session was not beneficial since no negative responses were given.





Chart 4.6 Learners' views on the usefulness of the corpus training in exploring words with affixes

Finding the training session useful does not necessarily mean that the participants did not need more corpus training sessions in order to be more confident with corpus use as well as perform better with the corpus vocabulary tasks. Respondents were asked to share their views related to the statement: "But I needed more corpus training to do the tasks better (with more confidence)", which was clearly designed to complement the previous statement. Based on *Chart 4.7* given below, the statistics show mixed results in terms of students' perceptions on the need for more corpus training. Over half of the participants in the questionnaire either strongly agreed or agreed with this statement. These figures clearly indicate that insufficient corpus training may have been an issue in the present study, at least with half of the participants. Only about 35% of respondents felt that the actual training session was sufficient for them since they either disagreed or strongly disagreed with the statement. The rest of the respondents felt uncertain about whether they needed more training sessions so as to perform better in corpus tasks as well as become more efficient in interpreting concordance lines.





Chart 4.7 Students' opinion on the need for more corpus training for the purpose of achieving the tasks better

The questionnaire data indicates that participants have positive perceptions of learning new words with affixes with the help of concordance lines. *Chart 4.8* below clearly shows that this is the case with all respondents. Namely, almost all respondents, i.e. roughly 90%, strongly agreed when asked to share their views on the statement: "I liked learning new words (with affixes) from corpus". Only a small percentage (about 10%) of respondents agreed with the statement. It is important to point out that, despite some learning difficulties learners faced during the treatment sessions we already discussed earlier, such as inferring meaning of new words from concordance lines without a dictionary, they don't seem to have changed their positive views about learning new words with corpora.



Chart 4.8 Learners' attitudes towards learning new words (word parts) from the corpus

The figures from the questionnaire show that participants had positive thoughts on the vocabulary activities done in the study (*Chart 4.9*). In fact, the responses are very identical to the previous ones given on learning new words with a corpus. Namely, students' responses to the statement "I liked the vocabulary activities (tasks) we did" showed: about 90% of respondents strongly agreed with the statement whereas 10% of them only agreed.



Chart 4.9 Students' thoughts on the vocabulary activities done in the study

Despite the positive views on the activities, the questionnaire figures show mixed results when it comes to participants' need for more instructor support during the corpus activities. As *Chart 4.10* below illustrates, almost half of the respondents either disagree or strongly disagree with the statement: "I liked the activity but I needed more support (help) from the instructor", by showing thus confidence in dealing with the tasks. Not all respondents, however, had the same level of confidence. About a quarter of responses show uncertainty or neutrality on the statement, while about 25% of responses suggest that a quarter of participants needed more instructor support. As mentioned in the previous chapter, the experimental group was required to do more autonomous vocabulary tasks, and as figures show in this case, the majority of students felt confident with the autonomy while some others felt that they needed more assistance during the corpus tasks.



Chart 4.10 Students' views on the need for more instructor support during corpus activities

*Chart 4.11* below clearly indicates that the vast majority of participants (roughly 85%) in the study had positive opinions on the note-taking sheets they used during the corpus vocabulary tasks. As described in more details in the previous chapter, the note-taking sheets included hints and some examples which served to aid students during the corpus tasks. Thus the responses clearly show that students were positive about how these note-taking sheets were designed.



The vocabulary note-taking sheets we used during the vocabulary activities were not well designed

Chart 4.11 Students' opinions on the note-taking sheets

The participants in the questionnaire have positive views on how the instructor managed the sessions as part of the study. As *Chart 4.12* shows, the respondents unanimously strongly agreed that the instructor managed the classes well during the treatment period. The instructions, as pointed out in the last chapter, were offered with the help of corpus, using note-taking sheets, and with more student autonomy. The responses thus point to the fact that students were satisfied how these classes were managed and taught.



Chart 4.12 Learners' attitudes towards the way the instructor taught the classes during the study

The experimental group participants felt that the corpus assisted them in memorizing new words with affixes. According to the questionnaire figures (see *Chart 4.13* below), roughly three quarters of the respondents strongly agreed that this was the case, while almost all of the remaining respondents agreed with the statement. It is important to mention that students' perceptions at this point are consistent with what the test results (on vocabulary retention) show. The delayed test scores (discussed in the test results in the next section) clearly indicate that the experimental group managed to retain a significant amount of the vocabulary covered during the treatment period. It is thus important to note that students were aware of that and this can be easily inferred from these questionnaire responses.



Chart 4.13 Learners' thoughts on whether the corpus helped them memorize new words

During the treatment period, students were required to use concordance lines, in addition to some hints given in their note-taking sheets, in order for them to infer meanings of the new words with affixes. This raises the question whether they found examples in the corpus helpful for this purpose.

According to the responses in the questionnaire illustrated in *Chart 4.14* below, the majority of the respondents strongly agreed with the idea that the examples in the corpus helped them in understanding the new words, while almost all the remaining 20% of the respondents agreed with the statement. Only an insignificant percentage of respondents felt uncertain on this and, as the chart itself suggests, there was no respondent to have found concordance lines unhelpful at this point.

Comparing these figures with the ones obtained by the second rating question illustrated in *Chart 4.2* earlier, it is reasonable to claim that, although some students found inferring meaning

from the concordance lines at medium difficulty (see *Chart 4.2*), that does not necessary imply that they found them unhelpful. This can be easily noticed in *Chart 4.14*, in which almost all respondents felt that examples were in fact a helpful hand for them during the corpus tasks.



Chart 4.14 Learners' thoughts on whether the corpus helped them understand the meaning of new words

Similar conclusion can be drawn when it comes to using concordance lines to understand how words are used in a sentence. The participants in the experimental group found corpus examples useful for this purpose (see *Chart 4.15* below). According to their responses in the questionnaire, the majority of them, i.e. 60% of respondents, strongly agreed with the statement "The examples in the corpus helped me understand how to use the new words in sentences". The remaining 40% only agreed with this statement and there was no participant that had found concordance lines unhelpful for this purpose.

It is important to stress that the figures in this particular case are in agreement with the high test scores achieved by the experimental group in terms of productive vocabulary knowledge (see section 4.1.4.2). Since using words in sentences was part of the productive vocabulary

tasks in the test, it turns out that the corpus played an important part in those scores. And, as Chart 4.15 below indicates, participants were confident that concordance lines played a major role when it came to using new words in sentences.



The examples in the corpus helped me understand how to use the new words in sentences

Chart 4.15 Learners' thoughts on whether the corpus helped them understand how the new words are used in sentences

An important matter to explore in the study was whether there were enough examples in the corpus for the participants to look at during the tasks. As mentioned in the previous chapter, the corpus was set up to provide only a limited number of concordance lines (about 20 for each query) since a very long list of concordance lines would confuse the learners. Thus, a statement in the questionnaire was used to infer participants' thoughts on the number of concordance lines used and whether these were sufficient for them during the corpus tasks. Chart 4.16 below clearly shows that most of the participants thought that the number of concordance lines were sufficient for them to do the corpus tasks. Namely, nearly 80% of respondents either strongly disagreed or disagreed with the idea that there had not been enough corpus examples for them to use during the corpus tasks, while only about 18% of respondents expressed uncertainty or neutrality on this.



Chart 4.16 Students' thoughts on the amount of examples for words in the corpus

The responses show mixed results in terms of the level of difficulty of some examples in the corpus (see *Chart 4.17* for figures). When asked to express their views on the statement "Some examples in the corpus are difficult for me to understand", nearly 36% of respondents disagreed, while roughly 33% agreed that they found some examples difficult to comprehend. About a quarter of respondents were undecided or uncertain about this. These results are consistent with the language proficiency of the participants in the study. As pointed out earlier, the group consisted of students with various language proficiencies, ranging from intermediate to advanced level. Thus, it is reasonable to conclude that the responses here reflect this fact, that is, some students with lower language proficiency found more examples difficult to comprehend compared to some others who had better language skills.



Chart 4.17 Students' views on the difficulty of the examples available in the corpus

Students of the experimental group were asked to share their views on whether they see learning new words with a corpus as an alternative to learning traditionally, using a textbook. The responses in the questionnaire (see *Chart 4.18*) indicate that the majority of participants, that is nearly 80%, either agree or strongly agree with the idea. Only a small percentage of responses show uncertainty or neutrality on this matter, while a statistically insignificant percentage shows a disagreement with this idea.



Learning words with a corpus should be sometimes used as an alternative to learning with textbooks (as we usually do)

Chart 4.18 Students attitudes towards using a corpus to learn new words as an alternative to using textbooks

Participants were also asked to share their thoughts on the statement: "After all the activities we have done in the class, I don't believe I can use the corpus alone (e.g. at home)". Just over 80% of the respondents either strongly disagreed or only disagreed with the statement (*Chart 4.19*). The rest of the respondents were uncertain or neutral on the issue. All in all, these results indicate that participants, i.e. the experimental group, managed to develop some confidence in using the corpus autonomously, even after having received limited corpus training.





Chart 4.19 Students' confidence in using the corpus independently

The last part of the questionnaire was concerned about the participants' attitudes towards corpus becoming part of language education in the future. As the questionnaire responses in *Chart 4.20* clearly show, the vast majority of respondents had a positive attitude towards corpus becoming part of language classroom. Namely, half of the respondents strongly agreed whereas about 40% agreed with the idea. Only a small percentage of respondents, about 10%, were uncertain or neutral.



Chart 4.20 Students' attitudes towards having corpus becoming part of language classroom in the future

## 4.2.3 Conclusion

In this section, a detailed analysis of the questionnaire was carried out. In general, the results indicate that the participants have positive attitudes towards the corpus as a learning tool as well as towards the corpus-driven vocabulary teaching and learning. The questionnaire responses also point to some obstacles that some participants had encountered during the treatment period which deserve some considerations. These hindrances, however, do not appear to have affected the overall positive perceptions of corpus and learning vocabulary by the help of corpus and concordance lines.

### **4.3 ANALYSIS OF SELF-REFLECTION PAPERS**

In this section, a detailed analysis of the self-reflection papers will be carried out. They consisted of some guiding questions and were intended to have participants expand on their attitudes, feelings, and experiences in using concordance lines in exploring new words with affixes. More precisely, they asked participants to express their views on corpora as language learning tools, to expand on their experience of learning and being taught with the help of a corpus, to share obstacles if encountered while doing the tasks as well as exploring or learning new words with the corpus, and to share other views, if any. Thus, the papers were aimed to be complementary to the results of the questionnaire and they add to the qualitative part of the study in general.

Participants wrote various remarks expressing their attitudes and views on corpora and corpus consultation. Similar to what questionnaire results show, students mostly wrote positive comments on their experience with DDL. Below, we discuss some of the positive remarks and experiences they shared. Note that in this section indented lines mark direct quotation from the participants' remarks; quoted participants are coded, e.g. *S8*, and are inserted at the beginning of each quotation; and lastly, comments in the brackets as parts of quotations are not given by participants themselves, but rather they are added by the researcher in order to clarify them whenever necessary.

Something that participants particularly stressed in their self-reflection papers is their positive attitudes towards corpora as learning tools. This was also marked on their questionnaires (see *Figure 4.5*) when asked to share their opinions on the corpus as a learning tool. Many of them found the corpus a very useful and an easy tool to use. For example one student wrote:

S8: Corpus is a useful tool for students...to enrich their vocabulary.

Similarly, another referred to the corpus as:

S4: ...very important language learning tool and an easy tool to use.

Another participant went on to provide reasons why she saw corpora as important learning tools:

S10: I think that is a really very helpful tool to learn and use vocabulary. Throughout these courses I enjoyed working with this program because I found a new way to search vocabulary and also trusted information.

For another student (S9), corpora are more convenient than standard dictionaries when it comes to providing examples for words, as the later provides much more context than what dictionaries typically do. Similarly, the corpus was also seen as a very resourceful tool in which thousands of words with affixes could be found as well as a tool in which authentic language, i.e. used by native speakers, are available for students to refer to.

Participants' comments, similar to what the questionnaire results indicated earlier, also suggest that they felt learning took place during the tasks with corpus. This could be easily inferred by some of their remarks below:

S2: In a short time I can see my improvements.

S4: Corpus improved my vocabulary.

S5: I learnt new words with corpus.

Another thing that the experimental group students highlighted on their self-reflection papers is DDL as a teaching and learning technique. Some of them found the technique practical and easy, while some others an 'amazing' way to learn new vocabulary. What follows are some remarks on their attitude towards DDL:

S1: Very useful and easy learning technique.

S3: (DDL) I think is an easy and useful method to learn...vocabulary and other things we need to know.

S7: (Learning with corpora / through DDL) is an amazing way to learn vocabulary because it is a modern way of learning and very helpful at the same time.

In addition to these remarks, one participant added that she found corpus-based learning an easy method as it incorporates technology, while another pointed out that learning new vocabulary through DDL was a very suitable and practical technique for her.

Almost all of the participants highlighted the fact that examples, i.e. concordance lines, are one of the most distinguishing features of corpora. One of the values that were noted, in particular, was the fact that corpus had sufficient examples for the students to look at, which is harmonious with what participants marked in their questionnaires (see *Chart 4.16*). This, in turn, points to the fact that they saw concordance lines as an asset and a useful corpus feature for the purpose of vocabulary learning. Students mentioned various reasons why examples were useful to them. According to some, concordance lines aided them in learning as well as memorizing words:

S1: You can find a wide range of examples and you are given the possibility to choose the ones which are closer to your level of English. The thing I like the most about using a corpus in learning vocabulary is the fact that the word you are looking its meaning for is inserted into sentences, so this makes it easier to learn the definition of the word as you see it as part of a context.

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S6: Examples helped me learn the words better.

For another participant, with corpora one can find and explore sentences from different genres and styles. In addition, she added that concordance lines not only aided them in understanding words, but they also could help them in inferring new definitions of words considering that there were many examples in the corpus.

Last but not least, a few students referred to word usage as something that they benefited from looking at the examples in the corpus. According to one student:

S4: By the examples you understand words and you learn how to use the words.

while for another:

S6: It is not enough to know the meaning of words but also how to use them in sentences.

These remarks could be said to correspond to the questionnaire responses (see *Chart 4.15*) in terms of learners' thoughts on whether the corpus helped them understand how new words were used in a sentence. As the responses there indicated, the participants found corpus examples supportive in understanding new words and the positive remarks discussed here seem to complement that.

The participants' remarks indicate that they unanimously agreed that DDL and corpora should be used in English language classes and provided various reasons. According to one student, DDL is a good technique and therefore it should be incorporated in language education. For some other participants, corpora make learning easier and useful: S3: Corpora should be used in English classes because it will be easier for us to learn vocabulary and new words.

S7: Corpora should be definitely used in English classes as extra classes for the vocabulary part because they are helpful in learning new words and their meanings.

Some participants did not limit themselves in showing how useful the corpus was in their tasks, but went further to suggest other benefits of using the tool. For instance, one student suggested that integrating DDL and corpora in the language education would help them start using the tool autonomously and beyond the language classroom, i.e. at home. Some others thought critically and suggested that corpora can be used beyond a mere vocabulary learning task:

S8: Corpora should be used more in language classes as they are helpful, for example, when you are writing an essay...or anything more formal, they help you find new words or tell you the correct ways a word is used in a sentence.

S9: Corpora should be used in some of the English language (courses), such as English language skills, translation, morphology, and syntax, because students can see how words function in a sentence; see the structure of words, and types of morphemes through examples instead of the old-fashioned and boring learning methods.

S10: It would be very useful when they (students) learn new words and are not sure how to use them in speaking and writing.

Students' self-reflection papers also included some negative remarks on corpora and DDL. It is important to point out, however, that these remarks were given by students who also wrote positive remarks. Thus, these comments were made in addition to other ones discussed so far.

According to one participant, the only disadvantage of using corpus for vocabulary learning is the amount of time one needs to spend in doing so. A few students noted that handling the program may be an issue for some students as well as the layout of the program (i.e. *IntelliText*) needed some improvements in order for students to navigate better:

S3: I think some people would find difficult to use corpora, so I think they can change (improve) it and make it easier enough so people can use it better, but otherwise everything about it is amazing.

S10: There isn't anything that I disliked (about the corpus) maybe they need to work on the design of the tool, but again it is not a problem.

Finally, as the questionnaire responses discussed earlier revealed, some learners clearly needed more time and additional training time in order to cope with concordance lines as well as the tasks in the treatment sessions. This was certainly an issue for a student who participated in writing a self-reflection paper. According to her, she had a hard time coping with the tasks, especially at the beginning. However, she also noted that she soon got familiar with the software and coped well with the tasks afterwards.

### 4.3.1 Conclusion

Complementary to the questionnaire results, students' attitudes and experiences were shared and discussed in this section. It provided us with better understanding of how some of the experimental group participants viewed the corpus as a learning tool and DDL as a learning
technique in the study. We saw that generally their perception of the corpus and DDL is very positive. As discussed throughout this section, participants particularly highlighted: the usefulness of the tool and the efficiency of DDL as teaching and learning technique; the concordance lines as a valuable corpus feature, among others. Some valuable comments were also given on how corpus and DDL experience may be improved. These included additional corpus training time, better corpus layout, and possible problems in coping with the program. These remarks may serve in improving and advancing corpora as tools and DDL as a learning technique in language education in the future.

# **5. DISCUSSION OF THE FINDINGS**

In this chapter we discuss the findings of the current research which were made possible through our three data collection instruments: the tests, the questionnaire and the self-reflection papers. The discussion primarily focuses on answering the research questions which have guided the study and discussing the study's hypotheses. Later in the chapter, we also explore: (1) how the current findings compare and contrast to the prior findings in the field; and (2) some pedagogical implications of the current findings.

### 5.1 Word retention through exposure to corpus data

This study has been primarily concerned with retention of vocabulary. Most precisely, it intended to investigate retention of word parts by two groups of university students: one group which used a traditional teaching and learning paradigm whereas the other group used a corpus interface and was hence exposed to corpus data. As pointed out in the literature review, a crucial element in vocabulary learning is for a learner to retain the words for later use and that "learning is remembering" (Thombury 2002, p. 23). Without retention, vocabulary learning would be meaningless and useless. Therefore, the primary research question that guided the current study was:

Q1: Is there a difference in retention between learners who learn vocabulary (word parts) with the help of corpora and those who learn through traditional practices?

This study used performance tests, i.e. a pretest, a posttest and a delayed test, to investigate this particular research question. The pretest was aimed to test both groups' previous (pretreatment) lexical knowledge; the immediate posttest was aimed to investigate the immediate gains; whereas the delayed test was intended to measure retention. Schmitt (2010) argues that immediate posttests after vocabulary instructions in research typically tell us whether the leaner has noticed the vocabulary and whether learning has initiated, but it is the delayed test which tells us whether acquisition has taken place. Thus, this study has been based on Schmitt's assertion by treating the immediate gains in the immediate posttest only as initial learning and noticing, whereas the delayed test performance as retention and genuine learning. In order to answer the present research question one test scoring statistics discussed in the results chapter will be used, that of overall vocabulary knowledge which shows the overall vocabulary gains by both the experimental and control groups without specifying the type of vocabulary knowledge (i.e. receptive or productive) participants retained in short-term and long-term aspect. In other words, in this particular categorization vocabulary gains were approached only quantitatively.

As the statistics from SPSS indicated in the previous chapter, the means of scores of the control group and that of the experimental group in the pretest were evidently very similar. The pretest results show that both groups' participants had limited preliminary knowledge of the vocabulary included in the test and that the performance of the two groups was comparatively very similar. Both the control group and the experimental group marked statistically significant gains in the posttest, but with the latter group scoring higher. This difference, however, did not show to be statistically significant. The delayed test figures, on the other hand, indicated that the means of scores of both groups marked a drop compared to the posttest figures. The statistics, however, showed that the drop in scores was greater and statistically significant for the control group, whereas that of the experimental group was very slight and insignificant. As a result, the delayed test clearly indicated that the experimental group managed to retain the posttest vocabulary gains significantly better compared to the control group. That is to say, retention, i.e. vocabulary learning, was significantly more successful among the experimental group participants who learned word parts with the help of *IntelliText*. To sum up, both groups showed significant gains in the immediate posttest, but the experimental group managed to retain (in the long-term memory) the vocabulary significantly better as shown in the delayed test.

Generally speaking, these results demonstrate that teaching and learning vocabulary explicitly as well as through using word part strategy have positive effects on a student's vocabulary development. Both groups retained significant amount of vocabulary from the treatment sessions. Although the control group experienced a drop in terms of retaining the treatment gains in the delayed posttest that does not necessarily mean that they did not retain sufficient vocabulary as the figures from delayed test still show significant retention in comparison with their preliminary vocabulary knowledge they showed in the pretest. The effectiveness of explicit vocabulary teaching and learning achieved in this study supports Schmitt's (2000) opinion that the explicit approach, in which attention on vocabulary is involved, increases vocabulary learning efficiency; and that the more learners devote their mental attention to certain words the better they are retained in the long-term perspective. Word part strategy, which is an explicit vocabulary approach used in this study, was shown to be useful to the efficacy of both groups. As pointed out earlier, word part strategy has been seen as a valuable strategy to learners. McCarthy, O'Keeffe, and Walsh (2010) maintain that word forms are useful in that they may tremendously boost learner's vocabulary in a short time period. Cook (2016) claims that the brain is most likely to receive and retain those words which are more organized in some way rather than those that are unsystematic, and that word parts are a suitable strategy for brain processing and retention. There is considerable evidence to support these claims. Earlier in the literature review chapter we referred to plentiful research (Mochizuki & Aizawa, 2000; Buddingh, 2005; Kim, 2013; Hasani, Mousavi & Zarei 2014) which point to the usefulness of the strategy. These studies are further supported by the findings in the present study.

On top of word part strategy that played a role in the successful retention of significant number of words among both the experimental and control group participants in the delayed test, it was the former, nevertheless, which outperformed the later. The participants of the experimental group who learned through DDL were significantly more successful in long-term vocabulary learning. It is thus reasonable to claim that corpus consultation and DDL have made the difference between the two groups. There are two main factors that have most likely

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contributed to better vocabulary retention among the experimental group participants who used DDL and consulted the corpus: the cognitive processes one experiences while engaging in corpus investigations and DDL as a technique.

As we mentioned earlier, insights drawn from psychology and SLA point to some processes a learner needs to go through in order to succeed in retaining new vocabulary and that these processes are believed to be consistent with DDL and how language is encountered and processed with the help of concordance lines. Based on learning theories and principles derived from psychology, Schmitt (2000) provides an explanation as to what is involved in successful retention of new lexical items. According to him, "the more one manipulates, thinks about, and uses mental information, the more likely it is that one will retain that information", and when it comes to vocabulary learning "the more one engages with a word (deeper processing), the more likely the word will be remembered for later use" (p. 120). What is important is that these processes are believed to take place when one engages in consulting concordance lines for linguistic clues. Reppen (2010), for instance, refers to SLA research to maintain that learners who are involved in corpus consultation tasks in fact manipulate with language which in turn results in better retention. Learners who are engaged in corpus enquiries are also believed to experience multiple cognitive processes. For example, O'Sullivan (2007) discovers a range of mental processes which are involved when one learns through DDL: speculating, making hypotheses and predictions, noticing, engaging in reflection, drawing inferences, among others. It is reasonable to expect that learners who use all these processes when investigating lexis in the corpus will result in successful retention compared to cases in which no or little effort is put in processing the newly encountered vocabulary. Last but not least, a corpus provides multiple exposures to a single lexical item and this is seen as a repetition. Quan (2016) points out that having learners exposed to numerous concordance lines in the corpus for a single lexical item may result in "focused repetitions of the target word, as learners are offered the opportunity to go through a number of examples in a short time, which may take years for them to meet via conventional reading" (p. 277). Considering all these facts drawn from psychology and SLA research and their consistency with DDL, it is plausible to believe that the experimental group

enjoyed many of these benefits during the course of the study and consequently this has resulted in better vocabulary retention. By contrast, the control group may have not enjoyed these important processes and thus their vocabulary learning resulted to be shallower. This assumption is based on the fact that they noticed vast amount of vocabulary (as clearly shown in the immediate posttest scores), as the experimental group did, but were not as successful as the experimental group in retaining them. Thus, the reasonable assumption that could be made in this case is that the control group did not enjoy as many useful cognitive processes as the DDL group.

Another factor that has contributed to better vocabulary retention among the experimental group participants who used the corpus is the nature of the DDL technique itself. As we pointed out earlier, in deductive methodology (used with the control group) one uses a general rule before moving to specific examples as it is the case in the typical traditional teaching and learning situations. In the inductive approach (used with the experimental group), on the other hand, one moves in the opposite direction, he starts from examples and then moves to make generalizations and infer rules. The experimental group was engaged in DDL vocabulary tasks (which were principally inductive) in which they were tasked to investigate the corpus, make generalizations, and infer meaning of words with particular affixes more autonomously. In a sense, each student had a role of a 'language detective' (Johns 1997, p. 101) whose responsibility was to use corpus data for vocabulary learning purposes. Moreover, DDL is very consistent with constructivist approach to language learning. As discussed earlier, a constructivist approach "views acquisition of knowledge as a dynamic process, with learners in the driving seat" (Flowerdew, 2015, p. 18) and that teachers' knowledge cannot be transferred to learners, but instead it should be constructed by learners (Slavin, 2018). In the study, the experimental group participants were the ones to lead the class whereas the instructor was more of a facilitator rather than a teacher in traditional sense (Warren, 2016). They were involved in 'constructing' knowledge, i.e. making generalizations and inferring meanings, about word forms by looking at the data provided in the corpus.

Following this discussion about DDL as a technique, we understand that the experimental group participants were given more roles in the class while investigating word forms. They were engaged in more mental effort in learning new vocabulary since they had to draw generalizations and infer meanings of words from concordance lines. By contrast, the control group was engaged in a more traditional teaching and learning style which was not as student-centered as in the case of the experimental group. The control group participants followed the PPP paradigm in which they were presented the word forms and then practiced the same. They learned the vocabulary deductively and thus they did not put as much as cognitive effort as the experimental group. It is thus reasonable to claim that DDL has also made the difference in the final results.

It seems from the results and the discussion in this section that engaging learners in vocabulary learning with the help of corpora, DDL, and in a more inductive way triggers more deep cognitive processes in the learner and this clearly results in better vocabulary retention and learning. Learners who engage in more inductive learning of word parts, on the other hand, also appear to learn considerable amount of vocabulary. However, learning deductively, which in essence is more passive and requires less effort, does not seem to involve the learner in the same experiences and cognitive processes that are typically enjoyed through DDL, and as a result, learning and retention is not as successful as learning with the help of corpora.

#### 5.2 Enhancing receptive and productive vocabulary knowledge with the help of corpora

Language learners should not only be able to comprehend or recognize words merely when encountering them (receptive knowledge of words), but also they should be able to recall words and use them in their output, e.g. writing (productive knowledge of words). Based on this idea, this study, apart from vocabulary retention, was also concerned with investigating if learning new vocabulary with the help of corpus would result in better receptive and productive vocabulary knowledge in comparison with learning through a more traditional approach. As already pointed out in the methodology section, the overall content of the test was balanced between tasks that were considered receptive vocabulary knowledge and those which tested productive vocabulary knowledge. Namely, a part of VKS which required students to provide meaning of the words and the last task of the test which asked the participants to match the halves and complete the sentences were designed to test students' receptive knowledge. The last part of the VKS (option V) in which students were asked to provide a sentence for each word given there and task three which asked the students to recall as many words with the affixes given there were designed to test participants' productive vocabulary knowledge. In short, receptive knowledge of words included providing meanings and recognizing word forms, whereas productive vocabulary knowledge included using a word in a sentence and recalling words. The categorization of receptive / productive vocabulary knowledge was done based on the criteria set by Nation (2000). Therefore, the second research question that guided our research was:

Q2: Is there a difference in receptive and productive vocabulary knowledge between learners who learn vocabulary with the help of corpora and those who learn through traditional practices?

## 5.2.1 A discussion on receptive vocabulary knowledge results

As the figures of the pretest in terms of receptive vocabulary knowledge indicated in the last chapter, both the means of scores of the control group and the experimental group were statistically low. This indicated that both groups had low preliminary (pre-treatment) receptive knowledge of the vocabulary included in the test. Moreover, it was also found that the groups' differences in means of scores were statistically insignificant and this indicated that both groups performed quite similarly in the pretest. The score statistics of immediate posttest showed that both the control group and the experimental group marked significant gains, but with the latter group marking a higher score. Although the experimental group showed better scores in the immediate posttest, the figures provided by *SPSS* did not show the difference to be statistically significant in contrast to those of control group. Group statistics for the receptive vocabulary knowledge in the delayed test, on the other hand, indicated that the mean of scores of the control group marked a drop (but not statistically significant) in contrast to the experimental group which marked a very slight rise. Contrasting the means of scores of both groups in the delayed test, the statistics showed that the difference was statistically important. That is to say, the control group did not manage to retain the receptive vocabulary knowledge as much as the experimental group, and as a result, the gap between the means of scores of the groups widened and thus became significantly different.

What we understand from these results is the fact that corpus use results in somewhat better receptive vocabulary knowledge in the immediate post-treatment period, but not to say that it is much better than the traditional approach. The best effects of corpus consultation, however, are obvious in the long-term aspect as these are clearly indicated in the delayed test in which figures show remarkably more successful retention or learning of receptive vocabulary compared to the control group. The control group showed nearly as much gains in the immediate test but lower retention or learning in the delayed test.

It is evident from the results that corpus consultation plays a positive role in terms of receptive vocabulary learning, and most importantly, these positive effects are durable. This can be explained by the fact that the experimental group participant were exposed to many concordance lines containing the words they had to learn and that this multi-exposure may have accounted for sufficient gains as well as remarkable retention. For instance, earlier we cited Quan (2016) who maintains that having learners exposed to numerous concordance lines in the corpus for a single lexical item may result in "focused repetitions of the target word, as learners are offered the opportunity to go through a number of examples in a short time, which may take years for them to meet via conventional reading" (p. 277). In addition, the experimental group was tasked to infer the meaning of words with affixes from concordance lines and this must have played an important role on successful development (Nation and

Chung, 2009) and retention of the meanings of words included in the study. Referring back to the benefits of putting additional cognitive efforts while investigating a corpus, this also means that the DDL group experienced more brain processing while inferring meanings from examples in the corpus and this must have played an additional role in developing their receptive knowledge and making it a part of long-term retention. The results also suggest that learning through a traditional approach leads to considerable receptive knowledge of words but the same is not as durable as in learning through DDL. What was said about retention in the previous section could be also said here. That is, learning more passively and with less effort does not seem to involve the learner in the same experiences and cognitive processes that are typically enjoyed through DDL.

#### 5.2.2 A discussion on productive vocabulary knowledge results

In terms of productive vocabulary knowledge, the results showed that the means of scores of the control group and the experimental group in the pretest were statistically very low as well as very similar between the groups. That evidently shows that both groups had a very limited productive knowledge of the vocabulary included in the test. Both the control group and the experimental group marked significant gains in the posttest, with the latter group marking a significantly higher score. In contrast to the receptive vocabulary knowledge scores of the same test discussed earlier, the productive vocabulary knowledge of the experimental group in the immediate posttest resulted to be significantly better. Group statistics for the productive vocabulary knowledge in the delayed test, on the other hand, indicated that the means of scores of both groups marked a drop. The difference, however, was that the experimental group experienced a very slight and statistically insignificant drop in contrast to the control group the mean of scores of which marked a bigger drop and which resulted to be statistically significant. To put it another way, the delayed test figures clearly indicated that the experimental group managed to retain the posttest productive vocabulary knowledge gains highly significantly better in contrast to the control group.

It is important to point that when comparing the general scores (without making a control vs. experimental group distinction) in receptive vocabulary knowledge with the ones in productive vocabulary knowledge we have just mentioned we can notice that statistically the scores, i.e. gains in the posttest and delayed test, are much higher in the former than the later. This can be explained by the fact that mastering receptive vocabulary knowledge (in our case recognizing a word and providing a meaning for a given word) is easier than mastering productive vocabulary knowledge (in our case writing a sentence for a word and recalling words) which is more gradual and not as straightforward (see Schmitt, 2010).

It is obvious from the results of the posttest and the delayed test that corpus use results in successful productive vocabulary knowledge. The experimental group outscored the control group in the posttest and the difference in scores became even greater as the later experienced a significant loss of posttest gains in the delayed test whereas the experimental group, by contrast, retained almost all of the treatment productive vocabulary knowledge gains. In contrast to the receptive vocabulary knowledge statistics presented in the previous section, the figures in this category have shown statistically significant differences between the groups not only in the delayed test but also in the immediate posttest. As a result, we may conclude that learning vocabulary through corpus has positive effects in terms of productive vocabulary knowledge gains when comparing with the traditional teaching and learning technique. That is to say, students who learn word parts through corpora do not stop at the meaning level of words, but go beyond that. As the tests suggest, they were able to use the words in sentences as well as recall the words with affixes after a limited exposure to the corpus data during the treatment sessions significantly better than the participants who were taught with a traditional paradigm. Most importantly, productive vocabulary knowledge gained through corpus data shows to internalize successfully and thus it is available for long-term use.

As anticipated, the corpus consultation seems to have played a great role in developing the productive knowledge of the vocabulary among the corpus group participants as they were

exposed to a larger amount of data (both sentences and words with affixes) compared to the control group participants who were also provided with materials (words with affixes; examples for those words; and exercises) during the treatment, but far less from what corpus provided. This evidence seems to support many claims about the usefulness of corpus when it comes to aspects of productive vocabulary knowledge with which we have been concerned in the present study. One benefit of corpus consultation extensively mentioned in the literature is that of vast exposure to data. For Gabrielatos (2005, as cited in Gilquin & Granger, 2010), for instance, using concordance lines means 'condensed exposure', and that includes "learners are offered the opportunity to go through a number of examples in a short time, which may take years for them to meet via conventional reading" (Quan 2016, p. 277). Participants in the study had the opportunity to look at various examples for each word they investigated and this appears to have helped them in writing sentences with these words in the test. This finding is also consistent with Quan's (2016) assertion that having language learners use concordance lines can help them improve their understanding of how a particular word is used in real-life events and situations. In addition, exploring concordance lines for words and trying to infer meanings out of examples have contributed to the repetition of the words and, as a consequence, they have become internalized enough for the participants to be able to recall them.

The findings (in terms of both receptive and productive vocabulary knowledge) discussed in this section appear to be promising when it comes to vocabulary learning. Earlier, Cook (2016) was cited regarding what knowing a word generally entails. According to him, "we don't know a word properly until we have learnt its forms, its different types of meaning and the ways in which it is used in sentences" (p. 80). In this study, we saw that the experimental group that used the corpus successfully managed to cover at least some aspects of the three elements mentioned by Cook. As results indicated, the experimental group successfully and significantly enhanced their awareness on word forms, became familiar with their different meanings, and managed to provide some sentences with the newly introduced words. Of course, we are not trying to suggest that these words were mastered in all aspects of receptive and productive

vocabulary knowledge since that would require much more exposure. Nevertheless, the findings do suggest that corpus may help students in developing partial, but crucial, receptive and productive vocabulary knowledge which may be adequate for use as well as for further development.

## 5.3 Vocabulary improvement with the help of concordancers from students' perspective

Research on new teaching and learning techniques and tools would be of no use without ensuring that its users (i.e. students) are willing to use or have positive perceptions of them. Therefore, this study not only aimed to test the effectiveness of corpus as a learning tool and DDL as a technique, but also to ensure students feel positive about them. Bearing these aims in mind, the study was also dedicated to provide an answer for our third research question:

# Q3: What are the learners' experiences and attitudes towards using corpora in vocabulary learning?

Research instruments that were used to investigate the experimental group participants' attitudes were a section of the questionnaire and the self-reflection papers. In the *Results* chapter we provided statistics and an overview of these separately. Here we discuss the results from a theoretical and our point of view.

The experimental group participants' responses and remarks on using a corpus and DDL for vocabulary learning (i.e. word parts) showed interesting, though anticipated, results. Below we provide a summary of the results and a discussion on the findings.

#### 5.3.1 Participants' views on the corpus training

From the outset of this study having participants trained for corpus use was essential but at the same time a concern. Theorists and practitioners have clearly noted that in order for DDL to work in the class, students should be initially trained in corpus use and this in essence includes two things: training students to use the program and train them in data interpretation. The training itself sometimes may be insufficient and this may result in DDL being ineffective. For instance, Gaskell and Cobb (2004) in their research found that corpus consultation was useful but hard for learners. As a result, they maintain that learners need sufficient training in corpus use before we expect the method to work. This study, as thoroughly explained in the methodology chapter, had one session reserved for corpus training. The training included both training students to use *IntelliText* for the purpose of exploring word parts and training them in interpreting the corpus data. Although useful, we were fully aware that one session of training may not be sufficient, at least for some of the participants, and this has been a concern throughout the study. Therefore, a part of questionnaire was concerned with investigating the participants' attitudes towards the corpus training session and the need for more corpus training.

As the statistics indicated in the last chapter, the participants unanimously felt that the training session, offered prior to the treatment period, was very useful for the purpose of exploring and learning new words with affixes. Finding the training session useful, however, does not necessarily mean that the participants did not need more corpus training sessions in order to be more confident with corpus use as well as perform better with the vocabulary tasks. When asked whether they needed more corpus training in order to become more efficient in the tasks, just over half of the respondents strongly agreed or agreed with the idea that they did need further training as opposed to the rest of the participants who were either unsure or confident enough that they had received enough training. The finding, therefore, suggests that at least half of the participants were not fully confident with engaging in corpus investigation of word parts. This, on the other hand, does not suggest that these participants had negative

attitude towards the corpus and DDL since, as the discussion below will reveal, participants in general had positive attitude towards both the corpus and the activities. By contrast, it suggests that these participants were confident that they could have done even better with the tasks if they had received more corpus training.

#### 5.3.2 Students' views on the difficulty of using the corpus in vocabulary learning

The study also aimed to investigate how difficult the use of the corpus was for the participants. More precisely, students were asked to rate the difficulty of: exploring words with affixes in the corpus, the language used in the corpus, inferring meaning from concordance lines, and the method they used to learn word parts. The results discussed in the previous chapter revealed that the participants found it very easy or easy using the software to find words with certain affixes and launching concordance lines. Similar perceptions were also found in terms of the method (learning vocabulary with the corpus) that participants used during the treatment sessions. Not every participant from the control group, however, found inferring meaning an easy task. As the results indicated, roughly only half of the participants rated it a very easy or easy task whereas the other half rated it at medium difficulty. It seems that even the (word meaning) hints that were provided for this group did not make inference from the concordance lines easy enough for them. Similar results were found when it comes to the level of English in the corpus. In this case, by contrast, only a third found the difficulty of the language in the corpus at medium difficulty whereas the rest found it easy. This, in fact, was something that was expected to be the case with at least some students considering that the group consisted of students with various level of language proficiency and hence perceived the level of language in the corpus differently.

Based on these findings from the questionnaire, it may be argued that inferring meaning form concordance lines as well as the level of English (though to a lesser degree) were the most troublesome aspects of using the corpus for the purpose of learning word parts. When comparing the use of the program with interpreting the data, the later seems to have been the most troublesome for some participants. This suggests that interpreting the concordance lines when it comes to inferring meanings of words may be quite challenging to some students. The same could be said for the level English in the corpus although, as the figures themselves show, this was not as troublesome as the inference. This could be explained by the fact that the participants had enough concordance lines to use in their task and whenever they found an example sentence with difficult words to understand they had others to refer to for the tasks. This was clearly noted by a student in her self-reflection paper: "You can find a wide range of examples and you are given the possibility to choose the ones which are closer to your level of English".

# 5.3.3 Attitudes towards the corpus as a learning tool and DDL as a technique

Based on the students' questionnaire responses and the remarks provided in their selfreflection papers, it is fair to claim that the students had a positive attitude towards the corpus. As the questionnaire statistics indicated, students had an overwhelmingly positive attitude towards corpus as the majority strongly agreed with the idea that corpus was a beneficial learning tool. Very identical and more thorough observations were also provided in students' self-reflection papers in which they pointed to several advantages they saw in the corpus, and these included:

- an easy and useful tool to use
- a new reliable tool (consisting of reliable information based on authentic language as produced by native speakers) and a new way to explore vocabulary
- more useful tool in terms of providing many more examples and much more context compared to standard dictionaries
- a very resourceful tool in which plenty of words with affixes may be found

It is, therefore, obvious from the data that the experimental group found the corpus a very helpful tool while exploring word parts. Most importantly, they also found the tool encouraging and this is evidently noted in their self-reflection papers.

What we have just said about the corpus as a learning tool, it could also be said about the DDL as learning and teaching technique. The data from the self-reflection papers likewise clearly indicated that participants had a positive perception of DDL as a technique. As we saw in the last chapter, students perceived DDL as a practical and easy technique; an 'amazing' way to learn new vocabulary; an easy method as it incorporates technology; a modern method to learn new words; among others. It seems that learners not only feel that they learn with corpus and DDL, but they also see the tool and technique as something new and contemporary and this in turn seems to motivate them. This idea is also supported by the fact that: "DDL has an important discovery element which can help to motivate students' learning and make it more enjoyable" (Warren 2016, p. 339).

Besides the positive responses and remarks, the experimental group students also provided few, but valuable, comments on a few difficulties they faced and suggestions on how corpus and DDL experience may be improved. These remarks raised the following issues related to using corpus and DDL for vocabulary learning:

- using the corpus is time-consuming
- handling the corpus may be an issue for some students and therefore ways to make it more user-friendly should be found
- the need to improve the layout of IntelliText
- experiencing difficulties in coping with the tasks during the treatment session

These comments, discussed in more detail in the previous chapter, may serve as important feedback and good clues in improving and advancing corpora as tools and DDL as a learning technique in language education. In fact, some of the issues raised by the participants are commonly discussed in the literature as limitations and which deserve consideration when one decides to use DDL in the language classroom. DDL tasks as possible time-consuming activities for instance, have been a concern raised by many theorists and practitioners. Gilquin and Granger (2010) mentions several possible limitations of DDL that are typically discussed by researchers, and among them, DDL being laborious to both teachers and learners is one. We

turn to discuss some of these issues in more detail below. It is important to note here, however, that these issues and suggestions were raised by a few students and not by majority of participants and consequently are not issues faced by everyone in the study. Also, it is important to point out that these remarks were given by students who also provided positive remarks on DDL and as a result do not diminish the positive attitudes all the participants had towards DDL discussed earlier.

#### 5.3.4 Attitudes towards using the corpus to enhance vocabulary (through word part strategy)

The questionnaire and the self-reflection papers were primarily aimed to investigate students' attitudes towards using the corpus to improve their vocabulary through word part strategy. Most precisely, participants were asked to share their views on: learning new vocabulary with the help of corpus and the hands-on activities in which they were engaged; whether they found the corpus helpful in memorizing the words, inferring meanings, and understanding how words are used in context; how they felt about using a corpus to learn new words as an alternative to using textbooks; and concordance lines or example sentences for words they found in the corpus.

As the results showed in the last chapter, participants' attitudes towards learning new words (with affixes) from the corpus and their perceptions of vocabulary activities done in the study resulted to be very identical. Namely, the vast majority of respondents expressed their overwhelmingly positive attitudes regarding these two subjects. These findings clearly show that learners found the corpus convenient for vocabulary learning whereas the activities, which were mainly inductive in nature, valuable and stimulating.

Another crucial subject to this study has been the role of the corpus in memorizing, clarifying the meaning of new words and in understanding how words are used in sentences. Besides the tests, the study was also concerned about how the participants felt about using the corpus in these processes. As the questionnaire figures indicated in the results section, the participants were very confident that the corpus had helped them in memorizing new words with affixes. These effects were also recorded in some of the self-reflection papers. For instance, one student expressed her amazement at how fast her vocabulary improvement had taken place. But most importantly, this was also the case in the tests. As the analysis of the results show, retention was one of the major benefits of corpus use. When it comes to the usefulness of the concordance lines in understanding the meanings of words, the majority of the respondents (similar to the figures on memorizing words) strongly agreed that the examples in the corpus helped them in understanding the new words although they did not find the task of inferring meanings from concordance lines an easy one. Nevertheless, that does not necessarily mean that they were not useful to them. Lastly, similar conclusions were drawn when it comes to using concordance lines to understand how words are used in a sentence. The participants in the experimental group found corpus examples very useful for this purpose as all of them unanimously strongly agreed or agreed with the idea. Interestingly enough, these students' perceptions correspond to the test results as well. As the test scores have shown, the experimental group performed significantly better in productive vocabulary knowledge portion of the tests a part of which asked the students to write sentences for the words given there. Earlier we mentioned Quan's (2016) assertion that having language learners use concordance lines can help them improve their understanding of how a particular word is used in real-life events and situations. From the test results as well as from the students' perspectives and beliefs this seems to be the case. Participants not only performed well in sentence sections of the test, but were also confident that the concordance lines had helped them in that.

The usefulness of sentence examples for words in the corpus was also a dominant subject in the students' self-reflection papers. Almost all of the participants highlighted the fact that concordance lines are one of the most distinguishing features of corpora. One of the values that were noted, in particular, was the fact that corpus had sufficient examples for the students to look at. Students were also aware of the fact that, besides meaning and form, it was necessary for them to know the contexts a word is used (Cook, 2016). For instance, one student stated: "It

is not enough to know the meaning of words but also how to use them in sentences". In short, students are aware of the need for more than mere understanding of meanings of words and they see concordance lines as a useful corpus feature that could help them in understanding and producing sentences for new words they learn.

Despite the participants' highly positive views on the usefulness of concordance lines, they nevertheless, admitted the fact that they had found some example sentences for words in the corpus very difficult for their level. As the figures showed in the last chapter, the responses provided mixed results. When asked to express their views on the statement "Some examples in the corpus are difficult for me to understand", the responses mainly ranged from 'agree' to 'disagree'. The results thus clearly pointed to the fact that this was an issue for at least a third of all respondents. As the group consisted of students with various language proficiencies, ranging from intermediate to advanced level, it is reasonable to conclude that the responses there reflected this fact; that is, some students with lower language proficiency had found more examples difficult to comprehend compared to some others who had better language skills. The good thing about the corpus, however, is that there are many examples for the students to look at and this may overcome the problem of facing difficult sentences. One student, in fact, mentioned this important feature of corpora in her self-reflection paper: "You can find a wide range of examples and you are given the possibility to choose the ones which are closer to your level of English",

# 5.3.5 Participants' attitudes towards more autonomous learning and their role as language 'investigators'

This study investigated the use of corpora in vocabulary learning and this, by default, means shifting away from traditional teaching and learning practices in terms of the role of the teacher and the student in the class as well as the degree of learner autonomy. At this point, the study

aimed to investigate the students' views on these new roles and practices that were incorporated in the study.

As pointed out in the *Methodology* chapter, the role of the instructor during the treatment sessions was more of a facilitator and hence the participants had more responsibility in carrying out the tasks. At this point, the questionnaire investigated participants' need for more instructor support during the corpus activities and figures showed mixed results. Only half of the respondents showed confidence in dealing with the tasks successfully. The rest of the respondents, however, either were uncertain or indicated that the needed more support during the tasks. The results thus clearly show that some additional assistance during the corpus tasks had been necessary. The need for more instructor support can be explained by the fact that they did not receive sufficient corpus training. As we pointed out at the beginning of this section, at least half of the respondents were not fully confident with the tasks and thus felt they had needed more corpus training and these responses seem to correlate with the ones earlier. Moreover, participants did not find inferring meanings from the concordance lines an easy task and this also explains the need for more support from the instructor.

The participants had positive attitude towards how the instructor taught the classes. As the figures from the questionnaire indicated, students unanimously strongly agreed that the instructor taught the classes well. This suggests that although some participants faced some difficulties with the tasks they still had positive perceptions of how sessions were taught. The instructor's role, as already pointed out, was more of a facilitator instead of teacher in the traditional sense (Warren, 2016) and this seems to have not troubled the participants.

Participants were asked if they would be able to use the corpus independently (e.g. at home) after all the activities they had done in the class. As the results indicated, the vast majority felt confident of being able to do so. This issue is of particular importance as one of the aims of DDL is not only to have learners engage in corpus investigations autonomously in the classroom but

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also outside classroom. Similar to dictionaries as lifelong reference tools, corpora can be used both as reference and learning tools during university years and beyond.

#### 5.3.6 Participants' perceptions on the need for corpus integration into the language education

Students of the experimental group were asked to share their views on whether they see learning new words with a corpus as an alternative to learning traditionally, i.e. using textbooks, and as the results indicated, the majority of participants either agreed or strongly agreed with the idea. Thus, the finding thus suggests that students see the technique positively that could complement the common method of using textbooks.

In addition to the participants' perception of mixing the corpus with the conventional methodology, the study was also concerned about the participants' attitudes towards the idea of corpus becoming integrated into language education in the future. As the questionnaire responses clearly showed, almost all of the respondents had a positive attitude towards corpus becoming part of language classroom. This positive perception was further revealed in the self-reflection papers. The participants' remarks indicated that they unanimously agreed that DDL and corpora should be used in English language classes and provided various reasons. Some of their justifications included: DDL is a good technique, corpora make vocabulary learning easier and useful, corpora would help students in understanding the meaning of words and the way they are used in sentences, and (one went further to suggest that) corpora may be used beyond mere vocabulary learning in other courses, such as translation, morphology, and syntax. The most important thing we can conclude from these findings is the fact that no matter what difficulties some of the participants faced during the treatment sessions with DDL and corpus use, they all support the idea of incorporating corpora into language classroom. This, in turn, reflects the participants' overall positive perceptions gained during the course of the study.

Concluding this section, it may be argued that the experimental group students had positive attitudes towards the way they were taught and the way they learned word parts with the help of corpus. That is to say, the participants had positive views on the inductive approach to teaching and learning. As pointed out earlier, this study adopted a softer version of DDL, or more precisely, it implemented the 4 I's (Illustration – Interaction – Intervention – Induction) advocated by Flowerdew (2009). What is essential in this case is the fact that the questionnaire responses and the remarks in general suggest that the approach was viewed positively by the participants. The findings also suggest that some students may find the preparatory training in corpus use insufficient and this may result in less confidence during corpus tasks. As the data from questionnaires suggests, some students may especially find inferring word meanings from concordance lines a difficult task to achieve. These limitations, nevertheless, do not seem to affect students' overall positive views regarding the usefulness of corpus as a learning tool and DDL as a teaching and learning technique.

#### 5.4 Boosting students' vocabulary with the help of corpora: advantages and hindrances

Last but not least, the study also aimed to identify some advantages and hindrances of using DDL in vocabulary learning based on the quantitative and qualitative data gathered during the course of the study. Accordingly, the last research question stated:

4. What are some advantages and obstacles to teaching and learning vocabulary (word parts) through corpora?

As we pointed out earlier, in DDL learners get to use naturally-occurring language, i.e. language used by native speakers in real situations, in their language learning process. Corpus software allows them to explore how language is used authentically as well as how it behaves naturally in different contexts. All this, in turn, leads to learners being "confident that they are learning the language they will encounter when they step outside the language classroom and into the world of language use" (Ruppen, 2010, p. preface). The experimental group participants were made aware of the BNC containing authentic language as produced by native speakers, as opposed to made up language typically found in the textbooks, and this was something encouraging to them. One student, for example, giving her reasons why vocabulary learning with the help of the corpus was important, explained: "In corpus we have language that is used by native speakers". Moreover, students found list of words with affixes based on frequency of occurrence an advantage that cannot be found in any grammar or language textbook available.

We also discussed how DDL is in line with many beliefs in psychology and SLA about how learning involves more in-depth processing of information. O'Sullivan (2007) mentions various useful mental processes that are fostered in the learner during DDL, some of which include: speculating, making hypotheses and predictions, noticing, engaging in reflection, drawing inferences, among others. As the findings in the present study suggest, thanks to the cognitive processes the experimental group participants were engaged in during corpus consultations in exploring and analyzing words with affixes their learning resulted to be more successful. As results clearly showed not only they succeeded in significant vocabulary gains but also were successful in retaining the information.

DDL is also highly motivational to language learners. As cited earlier, Gilquin and Granger (2010) maintain that DDL can develop self-confidence as a result of the discovery nature of corpus exploration and this tends to increase motivation and satisfaction during language learning. As recorded in plentiful DDL studies (Boulton, 2010), students have shown to view corpus as a very useful and an encouraging reference and learning tool. Similarly, the data from the questionnaire and students remarks in the present study suggest this to be the case with the participants who engaged in corpus queries to explore word parts. They clearly expressed their amazement at what the corpus is capable of doing in addition to suggesting the tool be incorporated in the future language classroom.

DDL, since its invention, has aimed to have learners lead in their language learning. In a typical DDL task learners explore the corpus using varieties of queries in order to become aware of how language behaves and this is done more autonomously in contrast to traditional teaching and learning practices. That is to say the technique involves "construct of capacity – attitudes and ability – that allows learners to take more responsibility for their own learning" (Benson 1997, p. 19; cited in Lamb & Reinders, 2008). Following these principles of DDL, this study had students work autonomously by exploring new words with affixes in the corpus, identify the more frequent words, launch concordance lines for words they found, infer meaning from concordance lines, and see how words occur in different contexts autonomously. More importantly, the findings suggest that they generally enjoyed what they did and how they did it. The fact that learner autonomy is a crucial component of DDL, it makes the approach broadly consistent with many contemporary language learning and teaching philosophies and approaches.

Having students explore word parts can be done by having learners directly engage in exploring the corpus or it could be also done through handouts (O'keeffe, McCarthy & Carter, 2007) which may have similar effects. The later would be more useful if corpus interface training is hard to implement or in cases when not all students are computer literate, i.e. lack basic IT skills. In some other educational settings computer labs may not be available and handouts may be a good option to begin with.

Apart from valuable benefits, this study also identified some limitations which deserve consideration when one decides to engage language learners in corpus vocabulary tasks. One of these is connected to corpus training. Gilquin and Granger (2010) draw our attention to the necessity for corpus training. Even with the significant improvements of corpus software, it is still necessary that learners undergo sufficient training in order for DDL to be effective. The training includes both preparing students to use the software, e.g. to execute different queries, as well as training them how to interpret data since corpus consists of raw data which is on the learners to understand and interpret. According to Gilquin and Granger, making learners use

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corpus without proper training may result in learners failing to do appropriate searches or most likely lead to unsuccessful interpretation of corpus data. Based on the findings of this study as well as on the observations during the treatment sessions, the use of *IntelliText* to do queries, find words, and launch concordance lines did not seem to be problematic for the participants. Some limitations, however, were identified in terms of interpreting the corpus data while doing the tasks. Some students' responses suggested that they needed more corpus training. Two things can be inferred from this finding. One is that not all learners cope with the corpus training identically, that is, some students may need more training than some others. Secondly, interpreting data seems to be more problematic than using the corpus software when it comes to using the corpus for vocabulary learning (word parts).

In connection with the corpus training, a pure inductive approach to learning word parts with the help of corpus also may become an issue. Not all learners may be comfortable with engaging in inductive tasks. Although this study adopted a softer version of DDL by providing additional support from the instructor as well as hints, some participants still needed further support during the tasks as this was clearly noted in the questionnaire. This suggests that learners have different learning styles and DDL may be more difficult for some students who either need more time to cope with the technique or need additional training in DDL.

Another hurdle has to do with the difficulty level of the corpus text. The corpus text, such as the one in the BNC, is naturally-occurring and excludes any modification or simplification to suit all kinds of learners' levels. For this reason some researchers and theorists (e.g. Hunston, 2002) consider corpora to be more suitable for more advanced learners rather than beginners. For that reason, some students may find the level of English harder than some others considering that usually classes consist of mixed ability students. This was surely the case with the experimental group which consisted of students with different language proficiencies. As the questionnaire responses and figures indicated, some students found the level of English in the corpus a bit challenging. The findings in the present study thus suggest that the language level

of the corpus text may be an issue for students who are tasked to learn vocabulary with the help of concordance lines.

These impediments in the practice of DDL in vocabulary learning, however, are far from eclipsing the importance and the promising capabilities of the technique. As the quantitative and qualitative data in the current study show, DDL has a lot to offer in terms of vocabulary learning.

# 5.5 A Discussion on the hypotheses

This study aimed to examine the following two hypotheses:

- Teaching and learning vocabulary with the help of corpora lead to better vocabulary retention among EFL learners compared to traditional practices.
- Teaching and learning vocabulary with the help of corpora result in better receptive and productive vocabulary knowledge among EFL learners compared to traditional practices.

The present study used performance tests to examine both hypotheses. As in the case with our research questions, this study has been based on Schmitt's criteria (2010) by treating the immediate gains in the immediate posttest only as noticing or beginning of learning, whereas the delayed test performance as retention and genuine learning. In order to test the present hypotheses, test statistics discussed in the results chapter have been used.

As the statistics from *SPSS* in terms of retention of words (overall vocabulary knowledge) indicated, both the control group and the experimental group marked statistically significant gains in the posttest, but with the latter group scoring higher. The delayed test figures, on the other hand, clearly indicated that the experimental group managed to retain the posttest

vocabulary gains significantly better compared to the control group. These results, therefore, confirm our first hypothesis that teaching and learning vocabulary with the help of corpora leads to better vocabulary retention compared to traditional practices. As we have already pointed out in the discussion of our research questions, the teaching and learning approaches made the difference between the groups. Following the 4 I's paradigm, the experimental group was engaged in more inductive and exploratory tasks in which they had to 'construct' their knowledge from the data available in the corpus. As a result, they were involved in more mental effort in learning new vocabulary while drawing generalizations and inferring meaning of words from concordance lines. This was said to have contributed to their successful word retention. By contrast, the control group was engaged in a more traditional teaching and learning style which was not as student-centered as in the case of the experimental group and followed the PPP paradigm in which they were presented the word forms and then practiced the same. Moreover, they learned the vocabulary deductively and thus they did not put as much cognitive effort as the experimental group.

The *SPPS* statistics also showed differences between groups in terms of receptive and productive vocabulary knowledge gained during the treatment. As the Independent-Samples T-Test showed in the discussion of the results in the last chapter, the experimental group performed significantly better than the control group in terms of both receptive and productive knowledge of the vocabulary covered during the treatment period. These statistics, as a result, confirm our second hypothesis that teaching and learning vocabulary with the help of corpora results in better receptive and productive vocabulary knowledge compared to traditional practices. Earlier, we mentioned some factors that may have played a role in these differences between the groups. The most important one is that of the DDL group being exposed to vast amount of corpus data. They had the opportunity to see a lot of concordance lines for words and this seemed to have made them aware of how the words are used in context. Moreover, multi-exposure to words may have accounted for repetition of those words as well as remarkable retention among the experimental group participants. The control group, by

contrast, was also exposed to materials and examples, but still did not enjoy the benefits that are typically gained by engaging in DDL and corpus activities.

#### 5.6 A comparison of findings with similar studies

In the Literature review we mentioned two similar studies in the field of using corpora in vocabulary leaning. In this section, we briefly compare the findings of these studies with the ones in the present study.

The first study we mentioned was Tom Cobb's (1999) research with a group of university students. His main focus of investigation was enhancing the participants' vocabulary with the help of a computer program which included both word definitions and concordance lines. In other words, the software was a special kind of dictionary, with a built-in concordancer, which was designed to be further developed by the students themselves by adding new words and examples from the concordance lines. In contrast to Cobb's research, the current study engaged students in direct interaction with a concordancer by excluding the use of a dictionary to identify meanings. The participants were given only some meaning hints for words while the rest was left on them to infer from the concordance lines. In terms of inductive vs. productive dichotomy, it appears that the present study was, to a degree, more inductive than Cobb's study.

His study was mostly concerned with two aspects of vocabulary knowledge progress among his students: the ability to recall definitions for words covered in the study as well as the ability to use the newly learned words in new contexts (in texts with gaps). In short, Cobb aimed to investigate both superficial (definitional) vocabulary knowledge gains as well as gains in terms of vocabulary depth (the ability to use the words in new contexts) among his students. Besides quizzes which were used to test short-term gains, his study also included delayed tests which aimed to check the participants' long-term retention of the vocabulary. In comparison with

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Cobb's investigation, the present study was more concerned with some aspects of receptive vocabulary knowledge (i.e. definitional knowledge and recognizing word forms) and some aspects of productive vocabulary knowledge (i.e. being able to write a sentence for a word as well as recalling words). As a result, something that the present study resembles that of Cobb's is the fact that both studies in a way investigate the effects of corpus contexts on the development of word knowledge as well as on the development of definitional knowledge.

Cobb's investigation showed relatively mixed results. Both the experimental group and the control group had significant gains when it comes to recalling definitions for the new words in the quizzes. However, differences were identified when it comes to using the newly learned words in new contexts. Namely, the control group didn't do very well in using the new vocabulary in new contexts as opposed to the experimental group which managed to do so quite successfully. These results suggest that concordance lines played a vital role at that point. The delayed tests on definitional knowledge also marked retention differences between the groups. The experimental group's test figures not only indicated successful retention but also marked further gains. On the contrary, the control group did not manage to retain the same as in the case with the experimental group. Some of the present study findings seem to be roughly consistent with the ones in Cobb. One is that corpus results in successful long-term retention of words which, in Schmitt's (2010) criteria, have been internalized and thus considered as learning. Secondly, corpus consultation results in more than merely mastering the recognition of words. In Cobb's study this was proven in students' ability to use the new words in new contexts, whereas in the present study, the participants were able to recall words and use some of the words in sentences significantly better than those who did not use concordance lines.

Another similar study we reviewed in the literature review was that conducted by Enes Yılmaz and Adem Soruç (2015). Their study included a group of Turkish students who were learning English language in a private language institution in Turkey. In contrast to the present study, their study comprised of participants who were teenagers and had a pre-intermediate language proficiency. The group was divided into an experimental group which learned the new

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vocabulary with the help of a corpus and a control group which were required to follow a more traditional paradigm. Yilmaz and Soruç used a pretest, posttest, and interviews as instruments to collect data.

Similar to the present study, Yılmaz and Soruç had the experimental group use an online corpus interface to learn some newly introduced words in a more inductive way, that is, by inferring meanings and looking at concordance lines for each word. The control group, by contrast, was provided with the meanings of the words, synonymous words, and native language equivalents in order to clarify the newly introduced vocabulary. In addition, they were also given some exercises in the end to revise the words.

Upon finishing with the treatment sessions, all groups were administered a posttest, which was more of a 'recognition test' (p. 2629), to assess the participants' vocabulary gains. At this point, two aspects distinguish their study from the present one. Yılmaz and Soruç used only a posttest which in the present study was considered to show only what student noticed and began to learn during the treatment session and not long-term learning. Secondly, the study does not go beyond mere recognition of (definition of) words which is only superficial knowledge of vocabulary. In the present study, a delayed test was used to test whether learning took place among the participants and, in addition to recognition of words, more aspects of vocabulary knowledge were included.

The results from Yilmaz and Soruç's study indicated that both the experimental and control groups had significant vocabulary gains. The experimental group, however, performed significantly better in recognizing the words compared to the control group, showing that learning through concordance lines resulted in better retention of words. These positive effects of corpus on word retention thus correspond to the present study findings. As brought up several times in the past sections, by having the experimental group participants engaged in corpus inductive tasks, vocabulary retention resulted to be significantly successful.

The analysis of the interviews used by Yilmaz and Soruç, on the other hand, showed that their experimental group participants had positive attitudes towards using concordance lines and COCA by pointing out that multiple contexts for words in the corpus had helped them remember the words better. These results thus show very identical attitudes towards the corpus as a learning tool recorded in the present study questionnaires and self-reflection papers. As the figures and remarks showed in the past chapter, the participants had positive perception of the corpus and ways it had helped them learn new words with affixes.

#### 5.7 Pedagogical implications of the study

The findings in this study suggest that learning word parts with the help of corpora in a more inductive way can significantly boost students' vocabulary in a short time period. In addition, the findings also point to the fact that this learning goes beyond mere recognizing of the meaning of a word. As figures and students' test indicated in the study, the corpus experience is fruitful in a way that it results in students being able to recall the new words and use them in sentences despite the limited exposure to corpus data and concordance lines. What is also important is that students enjoyed the experience of exploring and learning new words with affixes with the corpus. Therefore, this technique of teaching word parts may be integrated into conventional teaching practices in order to enrich the language learning experience of university students. As pointed out earlier, learning with a corpus should not be seen as a substitution to the present teaching practices, but rather a complementary one which may be used blended with conventional approaches and methods.

In the present study a softer version of inductive approach (i.e. DDL) was applied with the experimental group students. That is, extra instructor assistance was given if necessary in addition to some hints students were provided in their note-taking sheets. The decision for this was made based on the discussions in the literature related to the challenging nature of purely inductive approaches as well as on the experience derived from the pilot study conducted prior

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to the present study. Our findings from test results, questionnaire responses, and self-reflection papers, generally are indicative of the usefulness of the balanced approach applied throughout the study. Therefore, a softer version of DDL is suggested in order to make sure all students cope with the technique. This is particularly useful in some educational settings in which students are used to deductive approaches, as it was the case in the present study. However, since the deductive and inductive dichotomy is seen on a cline, then it could be proposed that whether one should use a stronger version or softer of DDL will mainly depend on the students and the DDL experience. In cases when students are noticed to cope well with corpus queries and the corpus tasks then the instructor could make the class more inductive. Also, the more students engage in corpus queries and tasks the more autonomous and comfortable they get with DDL and the inductive approach. Based on the class observation, this was the case with many participants in the study.

The present research identified some issues participants experienced during the course of the study. Namely, as the questionnaire and the students' remarks clearly showed, they mainly experienced some difficulties with interpreting the corpus data and there was no evidence to suggest that the problems were caused by other factors, such as handling the corpus program. Moreover, some participants reported to have had some degree of difficulty with the level of English in the corpus. These obstacles provide useful clues on some potential impediments language instructors may anticipate when engaging students in vocabulary learning activities with the help of corpora. As the findings suggest, more corpus training and more instructor assistance are key to minimizing and overcoming obstacles of this nature in DDL.

In this study an online corpus, i.e. *IntelliText*, was used by the students to conduct corpus queries to investigate words with affixes. The findings suggest that students managed to handle and navigate the program successfully. Also, as their responses suggested, they were positive about what the program offered while exploring new vocabulary in the treatment period. This suggests that online software should be simplified and user-friendly for the students in order to guarantee efficiency and minimize technical issues during corpus tasks. The online corpus

interfaces also require fast internet so that prolonged loadings can be avoided. In contrary, slow internet can be time-consuming and discouraging to students and therefore should be avoided as much as possible. IntelliText is, to our knowledge, one of the rare, if not the only, online interface that has a distinct section for searching words with affixes and as this study suggest, it is very useful if used in vocabulary lessons. Although very user-friendly, the interface still requires guidance and pedagogy. If used during vocabulary instructions, the instructors need to make sure they prepare in advance for the word investigations they plan to have their students do in the class. For instance, the word lists the software provides are typically not filtered out in terms of which words pattern based on an affix and which do not. That is to say, students need to distinguish between words that contain a certain affix (e.g. para- in paramedic) and those which do not (e.g. parasites in which the part 'para' does not represent the affix para-). In fact, IntelliText contains a feature which is supposed to filter the words in terms of affixation but the loading and launching a list with this option selected takes a long time to load and therefore is not suitable for class use. In this case, as done throughout the study, the instructor is required to assist students in ignoring some words that do not belong to the group of affixed words.

# **6. CONCLUSION**

In this concluding chapter, we initially provide a summary of the main findings of the present study. After that, we discuss some limitations of the study and conclude the chapter with some recommendations for further research.

#### 6.1 A summary of findings

The study examined learning word parts with two groups of university students. One group of students were trained in corpus use and were taught word parts with the help of corpus by engaging in a more inductive teaching and learning paradigm or a softer version of DDL. The other group, on the other hand, were applied a more traditional approach to teaching and learning by applying a deductive pedagogy. The findings from this study provide useful insights on vocabulary learning which adds to our present understanding of vocabulary learning and offer new ways to improve the vocabulary expansion among students. The main findings of the current study can be summarized as follows:

- The findings in this study support the widespread belief among theorists and practitioners as well as research findings in the field of vocabulary learning that word part strategy is useful in boosting learners' vocabulary. Generally speaking, both groups have proven significant progress in learning the new vocabulary assigned in this study. The findings from this research, therefore, suggest that word part strategy should be taught and promoted among university students as it guarantees efficiency in vocabulary expansion.

- Word part strategy proves to be effective, but data from this study suggest that corpus consultation could enhance the effectiveness of the strategy. As the overall figures and insights from the current research indicate, combining word part strategy with the use of corpus not

only can guarantee better vocabulary development and efficiency, but also a great learning experience for students.

- Scores in terms of vocabulary gains (i.e. calculated quantitatively) show that students who use corpus make significantly better vocabulary gains compared to the students who engage in conventional learning. As it has been maintained by many theorists, corpus investigation provides multiple exposures to data as well as repetition of lexical items and all these may guarantee better retention. The current study findings suggest that this has been the case with the experimental group participants who looked at various concordance lines for words they investigated.

- Vocabulary learning using a DDL technique showed to be very useful when it comes to improving students' both receptive and productive knowledge of the vocabulary covered during the treatment. Having students consult the corpus for vocabulary investigation as well as have them manipulate with the corpus data seems to improve not only their ability to recognize the word forms and remember their definition, but also improves their ability to recall many of the newly acquired words as well as their ability to use some of them in sentences. As statistics clearly indicated, learning through concordancers improves these vocabulary knowledge aspects better than learning in a more conventional method.

- By looking closely at all categories of test scores (overall vocabulary gains; receptive and productive vocabulary knowledge gains) of the experimental group, one notable advantage of corpus use that has been found in this study is that of retention. In line with many beliefs about the benefits of engaging students in more profound cognitive processes during corpus consultation, the study found that the students who used corpus data and who were engaged in DDL tasks managed to retain much of the post-treatment immediate gains. In other words, almost all of gains that they were recorded to have made during the treatment sessions were successfully retained in the delayed test (i.e. managed to store in their long-term memory). The

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control group, by contrast, did not manage to retain as much vocabulary knowledge as the experimental group.

- The overall statistics from the questionnaire and the students' remarks given in the selfreflection papers clearly confirm the positive attitudes the experimental group displayed towards the corpus as a learning tool. The overall responses of the participants in the questionnaire demonstrate their positive attitudes towards the corpus as a learning tool as well as towards the corpus-driven vocabulary teaching and learning. Similarly, the students' remarks also show various positive thoughts and views on many features of the corpus and DDL as a technique. Participants, for instance, highlighted: the usefulness of the tool which provides plenty of words with affixes; the technique as an 'amazing' way to learn new vocabulary; the concordance lines as a valuable corpus feature, among many others.

- Despite the overall positive results from corpus use for vocabulary learning and the participants' positive attitudes towards the corpus and DDL, some obstacles were also identified which deserve some consideration. One finding suggest that not all learners cope with the corpus training identically, that is, some students may need more training than some others, especially in interpreting corpus data (e.g. inferring meaning from concordance lines). Moreover, not all learners may be comfortable with engaging in inductive tasks. Although this study implemented a softer version of DDL by providing additional support from the instructor as well as meaning hints, some participants still needed further support during the tasks as this was clearly noted in the questionnaires. This suggests that learners have different learning styles and DDL may be more difficult for some students who either need more time to cope with the technique or need additional training in DDL. Last but not least, the findings also suggest that the language level of the corpus text may be an issue for some students who are tasked to learn vocabulary with the help of concordance lines, especially those who have low English proficiency. As a result, instructors who decide to engage their language learners in corpus vocabulary tasks should take some necessary preliminary steps to avoid, or at least minimize, these potential barriers.

- These impediments in the practice of DDL in vocabulary learning, however, are far from eclipsing the importance and the promising capabilities of the corpus as a learning tool and DDL as a method. As the most quantitative and qualitative data in the current study show, DDL has a lot to offer in terms of vocabulary learning and students have unanimously acknowledged that.

- Based on the overall successful vocabulary knowledge gains as well as students positive attitudes towards the corpus, it is fair to claim that corpora and DDL deserve a place in the language classroom. Corpus may be used as an alternative or supplementary to common teaching and learning practices as the students themselves noted in their questionnaires. Using the corpus to learn word parts could complement what usually textbooks offer. Moreover, the exploration of words with affixes may extend beyond mere learning of vocabulary, especially if used with students who study in English Language Programs. For instance, similar queries can be used in courses like Linguistics, Lexicology or Morphology in which students may become familiar with this type of word formation or the connection between word structure and meaning in English.

#### 6.2 Some limitations of the current study

There are some limitations that should be noted in relation to the present study. This study investigated the development of only some aspects of receptive and productive vocabulary among students and thus does not provide any data on how corpus consultation contributes to other aspects of this vocabulary knowledge dichotomy. Namely, the study was focused to investigate the effects of corpus use in terms of the ability to recognize word forms, remember word definitions, the ability to recall words and to use words in sentences. Although significant, these do not represent all aspects of receptive and productive knowledge of words as provided by Nation (2000). As we pointed out earlier language building is gradual and the teaching, learning, and testing of all aspects of words in a limited study like the present study is

impossible. Therefore, in this study, like in the two other studies conducted by Cobb (1999) and Yılmaz & Soruç (2015), the only few aspects of receptive and productive knowledge of words were investigated.

The participants in this study were all university students who were studying English as a foreign language. The experimental group consisted of thirty students studying in their 1<sup>st</sup> year of studies in the Department of English Language Teaching at IBU whereas the remaining ten students were 3<sup>rd</sup> year students from the Department of English Language and Literature at SEEU. The Control group, on the other hand, consisted of twenty eight students from which sixteen students were 2<sup>nd</sup> year students from the Department of English Language Teaching at IBU whereas the remaining twelve students were 1<sup>st</sup> year students enrolled in the Department of English Language and Literature at SEEU. The initial idea, however, had been to include the first year students from SEEU and the second year students from IBU into the control group; and vice versa, the second year students from SEEU and the first year students from IBU into the experimental group so as to balance the groups. But since the second year students of SEEU were not available due to the busy schedule as well as the unavailability of the computer lab, we had to include third year students from SEEU in the experimental group. The inclusion of third year students, therefore, makes the distribution unequal and thus it has been considered a limitation in this study. As this particular group of students had received more extensive instructions than the students of other groups, they are assumed to have had more language skills and this may have affected the test results in the study. Although, as the QPT scores (see section 3.5.2 for group scores) indicated, this group's level of English was not any different from other groups included in this study. In fact, their average score resulted to be lower (though not significantly lower) than all the other groups. This, in turn, may have minimized the chances of affecting the test results.

The insufficient number of participants in the study has also been considered one of the limitations. Fifty eight students took part in this study and this number, although acceptable, has been regarded as a small sample size for a research of this kind. As a result, the small

sample size may have not provided highly reliable data on vocabulary learning and may not be sufficiently representative of a broader population (i.e. EFL learners).

Lastly, as we discussed it in the methodology chapter, the study included several stages and it was completed in a period of four weeks for the experimental group whereas for the control group in a period of three weeks considering that the later didn't have the corpus training session. The treatment for both groups lasted two sessions, one session in each consecutive week. The study, therefore, was carried out over a very short period of time and this may have produced different results than if the same procedures had been used in a more longitudinal research.

#### 6.3 Recommendations for further research

The limitations of the present study we have just discussed offer opportunities for further research in the field. We discuss a few in the following paragraphs.

As we revealed above, this study investigated the development of only some aspects of receptive and productive vocabulary among students and thus does not provide any data on how corpus consultation contributes to other aspects of this vocabulary knowledge dichotomy. Consequently, other studies may be conducted in which other aspects, as listed by Nation (2000), may be examined. Namely, these studies may investigate how corpus consultation and students' exposure to corpus data contributes to mastering of other receptive and productive knowledge of vocabulary excluded in the present study. More studies in the field would further improve our understanding of vocabulary expansion with the help of corpora.

Some of the limitations of the present study we revealed in the last section were the relatively small number of participants and the fact that the research was carried out over a very short period of time including only a limited treatment period. As a result, the present study may be

replicated to include more participants and it could be more longitudinal. That is, the study would extend throughout one semester or even throughout a whole academic year. In that case more words with affixes would be included as well as frequent quizzes would be required in order to test short-term or immediate gains by the students. A more longitudinal research of this kind would further add to our understanding of the effects of corpora and DDL on vocabulary expansion among university students.

In conclusion, it is important to note that studies in the field of DDL and the use of corpora as learning tools are lacking (Flowerdew, 2015) and the opportunities for further research remain abundant and extensive. The more extensive research is done in the field of DDL the faster we can hope to incorporate corpora into the language classroom where they are expected to provide not only effective learning, but also enjoyable experience for students.

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## **APPENDIX A**

### A Sample note-taking sheet used by the experimental group

# Affix: over...

Meaning 1: too much

Meaning 2: power over something / a person or group has power over another

#### Use the corpus to find the exact meaning of the words given below:

overweight – too heavy and fat

overthrow -

oversleep -

overcome -

#### Some examples are given for you below. Add few examples from corpus yourself.

- She was a tall blonde woman, slightly **overweight** but still handsome.

What are some other words (you found interesting) that have this prefix?

# **APPENDIX B**

#### The Pretest / Posttest / Delayed Test

This test is designed to check your knowledge on the words given below. Please do your best to complete it.

Name of the student:	<i>Group:</i>
1. Circle the option that describes your knowledge of the word	's given below:
WORD: co-founder	
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:	
(Write a sentence.) (If you do this section, please also do Section IV.)	
WORD: foresee	
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:	·
(Write a sentence.) (If you do this section, please also do Section IV.)	
WORD: waterproof	
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:	
(Write a sentence.) (If you do this section, please also do Section IV.)	
WORD: ill-equipped	
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:	

(Write a sentence.) (If you do this section, please also do Section IV.)

## WORD: forefoot

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:	
(Write a sentence.) (If you do this section, please also do Section IV.)	
WORD: stress-related	
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:	
(Write a sentence.) (If you do this section, please also do Section IV.)	
WORD: oversleep	
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:	
(Write a sentence.) (If you do this section, please also do Section IV.)	
WORD: ill-health	
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:	
(Write a sentence.) (If you do this section, please also do Section IV.)	
WORD: overthrow	
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:	·
(Write a sentence.) (If you do this section, please also do Section IV.)	

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2. Write a	is many words a	s you can that	have (combine	with) the	prefix or suf	fix given below
------------	-----------------	----------------	---------------	-----------	---------------	-----------------

1. fore	 	 	
(Example: foresee)			
2. co	 	 	
(Example: <i>co-founder</i> )			
3related	 	 	
(Example: stress-related)			
4. over	 	 	
(Example: oversleep)			
5proof	 	 	
(Example: <i>waterproof</i> )			
6. ill	 	 	
(Example: <i>ill-health</i> )			

# **3.** Combine a prefix / suffix on the left with a word on the right to complete the sentences. (Be careful, there are a few extra words)

ill-	-related	over	sound	come	condition	consider	caster
-proof	fore	со	treated	exist	thought	alcohol	live

1. Can the two countries ever \_\_\_\_\_ peacefully?

2. They also had to keep windows shut during services and \_\_\_\_\_ the room.

3. However, weather \_\_\_\_\_\_ say the cyclone should move offshore, promising dry conditions on Sunday.

4. The US Coastguard estimates that at least half of those accidents are \_\_\_\_\_

5. The child had been severely \_\_\_\_\_\_ by his parents.

6. I don't think he'll ever \_\_\_\_\_\_ his fear of flying.

## **APPENDIX C**

#### The Questionnaire

Name: \_\_\_\_\_

This questionnaire is designed to check your opinion about the corpus and your learning experience in this study. Please select the answer/option that is true for you. Thank you!

Put a tick  $\boxed{\mathbf{v}}$  in the box below the answer that is true for you

1. How would you rate the difficulty of using the corpus (*IntelliText*) to search words with prefixes / suffixes?

Very easy	Easy	Medium difficulty	Hard	Very hard
2. How would you r dictionary)?	ate the difficult	y of finding the meaning of v	words in the cor	pus (without a
Very easy	Easy	Medium difficulty	Hard	Very hard
3. How would you r	ate the difficult	y of English (the difficulty of	language used)	in the corpus?
Very easy	Easy	Medium difficulty	Hard	Very hard
4. How would you r	ate the difficult	y of this method (learning vo	ocabulary with c	orpus/technology)?
Very easy	Easy	Medium difficulty	Hard	Very hard
Additional comme	nts (students w	ho ticked <u>hard</u> or <u>very hard</u> ar	e especially enco	ouraged to give reasons):

Put a tick	۷	in the box below the answer that is true for	you
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		strongly agree	agree	uncertain/ neutral	disagree	strongly disagree
1	I like corpus as a language learning tool (device)					
2	The corpus training in the Computer Lab helped me learn how to search and find words with affixes					
3	But I needed more corpus training to do the tasks better (with more confidence)					
4	I liked learning new words (with affixes) from corpus					
5	I liked the vocabulary activities (tasks) we did					
6	I liked the activities, but I needed more support (help) from the teacher					
7	The vocabulary note-taking sheets we used during the vocabulary activities were NOT well designed					
8	I liked how the teacher taught these classes in general					
9	Learning the new words with corpus helped me memorize them					
10	The examples in the corpus helped me understand the meaning of the new words					
11	The examples in the corpus helped me understand how to use the new words in sentences					
12	But, there were NOT enough examples for words in the corpus.					
13	Some examples in the corpus are difficult for me to understand					
14	Learning words with a corpus should be sometimes used as an alternative to learning with textbooks (as we usually do)					
15	After all the activities we have done in the class, I don't believe I can use the corpus alone (e.g. at home)					
16	Corpus should become part of language classes in the future					

Additional comments:

## **APPENDIX D**

## A sample of a self-reflection paper

## **Self-reflection paper**

Name: \_\_\_\_\_

What do you think of corpora as language learning tools (e.g. to learn vocabulary etc.)? Did you find this teaching/learning method easy/difficult, in what way? What do you like and dislike about using a corpus in learning vocabulary? Do you think corpora should be used in English language classes and why?

# **APPENDIX E**

# A sample of a self-reflection paper used in the Pilot Study

# Self-reflection paper

Name: \_\_\_\_\_

What do you think of corpora as language learning tools (e.g. used to correct errors in your essays, learn new vocabulary etc.)? Did you find the method easy/difficult, in what way? Do you think corpora should be used in English language classes and why?