THE COMPARATIVE EFFECTS OF DIRECT DDL AND INDIRECT DDL ON CONSTRUCTING VOCABULARY KNOWLEDGE

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DECLARATION OF ORIGINALITY

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ABSTRACT

The Comparative Effects of Direct DDL and Indirect DDL on Constructing Vocabulary Knowledge

This study investigated comparative effects of direct data-driven learning (D-DDL) and indirect data-driven learning (I-DDL) on learning new vocabulary. The participants were 52 university prep students with intermediate level of proficiency who were randomly assigned into one of the experimental conditions as D-DDL and I-DDL. Participants in D-DDL group studied the twenty target words inductively using online corpora, whereas the participants in I-DDL group studied the same target words inductively on paper-based concordances pre-selected from corpora by teachers. Adopting a quasi-experimental mixed methods design, the study utilized pre-tests and post-tests, individual think-aloud protocol, and focus group interviews in order to collect data. The collected data was analyzed in order to explore (1) how I-DDL compares to D-DDL on vocabulary recall and recognition, (2) how I-DDL compares to D-DDL on students' constructing vocabulary knowledge behaviors using corpus data, (3) how pair work and individual work differs in I-DDL and D-DDL practices, and (4) how students' attitudes towards I-DDL compare to D-DDL. The study filled in the gap in the literature by concluding that there was no significant difference between I-DDL and D-DDL on students' vocabulary gains according to pre-test post-test results. Qualitative data from think-aloud protocol and focus group interviews uncovered some differences and similarities between the two groups.

ÖZET

Doğrudan ve Dolaylı Veriye Dayalı Öğrenmenin Kelime Bilgisi Oluşturma Üzerine Karşılaştırılmalı Etkileri

Bu çalışma doğrudan veriye dayalı öğrenme (D-DDL) ve dolaylı veriye dayalı öğrenmenin (I-DDL) kelime anlamları öğrenimi üzerinde etkisini araştırmıştır. Katılımcılar 52 orta seviye dil yeterliliğine sahip üniversite hazırlık öğrencileridir ve D-DDL ve I-DDL olarak iki farklı deney grubuna rastgele alınmışlardır. D-DDL grubundaki katılımcılar yirmi adet kelimeyi çevrimiçi derlem kullanarak tümevarımsal yolla çalışmışlar, I-DDL grubundaki katılımcılar ise aynı kelimeleri kağıt üzerinde öğretmenleri tarafından önceden seçilmiş derlem verileri üzerinden tümevarımsal yolla çalışmışlardır. Yarı deneysel karma yöntem araştırma tasarımı benimseyen bu çalışma veri toplamak için ön-test ve son-test, bireysel sesli düşünme protokolü, ve odak grup görüşmeleri kullanmıştır. Toplanan veriler; (1) I-DDL ve D-DDL'in kelime hatırlama ve tanıma üzerine etkilerinin karşılaştırılması, (2) I-DDL ve D-DDL'in öğrencilerin derlem verileri üzerinden kelime bilgisi oluşturma davranışlarının karşılaştırılması, (3) ikili ve bireysel çalışmanın I-DDL ve D-DDL'da nasıl farklılık gösterdiğini, ve (4) öğrencilerin I-DDL ve D-DDL'a karşı tutumlarının karşılaştırılması için analiz edilmiştir. Çalışma literatürdeki boşluğu ön-test ve son-test sonuçlarına göre I-DDL ve D-DDL'in öğrencilerin kelime kazanımları üzerinde etkilerinin önemli ölçüde farklı olmadığını göstererek doldurmuştur. Sesli düşünme protokolü ve odak grup görüşmelerinden edinilen nitel veriler iki grup arasında bazı farklar ve benzerlikler ortaya çıkarmıştır.

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DEDICATION

This thesis is dedicated to my brother and my husband who are always there for me during the hardest and the most joyful moments of my life. They have always encouraged me to be the best version of myself.

TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION 1

1.1 Background to the study 1

1.2 Statement of the problem 3

1.3 Aims of the study 4

1.4 Significance of the study 5

1.5 Operationalization of terms 6

CHAPTER 2: LITERATURE REVIEW 7

2.1 Introduction 7

2.2 Vocabulary knowledge 7

2.3 Vocabulary learning and teaching in SLA 12

2.4 Corpus and Data-Driven Learning (DDL) in vocabulary teaching 19

2.5 DDL and vocabulary learning 24

2.6 Direct DDL (D-DDL) and indirect DDL (I-DDL) 26

2.7 Collaborative learning 36

CHAPTER 3: METHODOLOGY 39

3.1 Introduction 39

3.2 Participants 39

3.3 Context 41

3.4 Target words 42

3.5 Material development 43

3.6 Instruments 47
3.7 Procedure 52
3.8 Data analysis 56
CHAPTER 4: RESULTS 62
4.1 Introduction 62
4.2 Pre-test and post-test results 62
4.3 Think-aloud protocol results 72
4.4 Focus group interview results 87
CHAPTER 5: DISCUSSION 100
5.1 Introduction 100
5.2 Recall and recognition of vocabulary 100
5.3 Corpus consultation and vocabulary learning behaviors 103
5.4 Pair work and individual work 112
5.5 Students' attitudes towards DDL in vocabulary learning 114
CHAPTER 6: CONCLUSION 122
6.1 Introduction 122
6.2 Summary of the findings 122
6.3 Pedagogical implications 132
6.4 Limitations and suggestions for further research 135
APPENDIX A: TARGET VOCABULARY 138
APPENDIX B: MATERIALS FOR D-DDL CONDITION 139
APPENDIX C: MATERIALS FOR I-DDL CONDITION 143

APPENDIX D: PRE-TEST MEANING RECALL 162

APPENDIX E: PRE-TEST FORM RECALL 165

APPENDIX F: PRE-TEST MEANING RECOGNITION 168

APPENDIX G: POST-TEST MEANING RECALL 174

APPENDIX H: POST-TEST FORM RECALL 175

APPENDIX I: POST-TEST MEANING RECOGNITION 176

APPENDIX J: D-DDL THINK-ALOUD PROTOCOL TASK 179

APPENDIX K: I-DDL THINK-ALOUD PROTOCOL TASK 180

APPENDIX L: D-DDL INTERVIEW QUESTIONS 184

APPENDIX M: I-DDL INTERVIEW QUESTIONS 185

APPENDIX N: PARTICIPANT INFORMATION AND CONSENT FORMS 186

APPENDIX O: ETHICS COMMITTEE APPROVAL 190

APPENDIX P: SAMPLE TRANSCRIPTION OF THINK-ALOUD PROTOCOL DATA 191

REFERENCES 193

LIST OF TABLES

Table 1. Aspects of Word Knowledge 8

Table 2. Word Attack Strategies 16

Table 3. Interventional Steps of the Study 42

Table 4. Distribution of Target Words into Each Interventional Session 45

Table 5. Summary of Data Collection Tools and Their Purpose of Use 52

Table 6. Training Procedure for D-DDL and I-DDL 55

Table 7. Descriptive Statistics for Post-test Total Scores 64

Table 8. Descriptive Statistics for Meaning Recall Test 65

Table 9. Descriptive Statistics for Form Recall Test 66

Table 10. Descriptive Statistics for Meaning Recognition Test 67

Table 11. Summary of Means in All Tests 68

Table 12. Summary of Means in All Tests Regarding Words Studied during Pair Work and Individual Work 70

Table 13. Summary of the t-test Results of All Tests In Terms of Pair Work and Individual Work 72

Table 14. Comparing the Word Attack Strategies Within and Between Groups 75

CHAPTER 1

INTRODUCTION

1.1 Background to the study

Vocabulary knowledge is essential in language development as well as grammar and other language skills. Language learners need vocabulary in order to convey their intended meaning correctly and appropriately in their language production. According to Fisher and Frey (2014), vocabulary knowledge is not an isolated skill but the most important factor in language proficiency development needed for meaningful communication. As Wilkins (1971) also stated, “Without grammar very little can be conveyed, without vocabulary nothing can be conveyed.” (p. 111). Moreover, Allen (1983) emphasized the importance of vocabulary knowledge for communication in a second language and stated that communication breaks down unless there is correct use of vocabulary. As many researchers accepted the significance of vocabulary development for language learners (Laufer & Hulstijn, 2001; Schmitt, 2010; Thornbury, 2002), a large number of research has been conducted in Second Language Acquisition (SLA) investigating the ways to teach vocabulary efficiently since late 1980s. From then on, many researchers (McCarthy, 1990; Nagy, 1997; Johns, 1997; Read, 2000) have highlighted the importance of teaching vocabulary in context. They argued that word meanigns cannot be disconnected from their contexts. Meara (2002) states that “context can radically change the meaning of words, making familiar words opaque and unfamiliar words completely transparent” (p. 400). Hence, many teachers and classroom materials have aimed to teach vocabulary in context.

With the advancement of technology and its effects on corpus studies in the late 19th century, using corpus in language teaching started to attract researchers. Johns's (1981) Data-Driven Learning (DDL) approach to using corpus to teach language in language classrooms where studens use corpus data to learn language data inductively in authentic context has been accepted as an innovative and beneficial method especially in teaching vocabulary (Chambers, 2007). Research has shown that DDL is effective in language classrooms especially for students with intermediate level of language proficiency (Boulton & Cobb, 2017); however, there is little evidence of DDL practices where students directly interact with online corpora in language classrooms (Conrad, 2005; Römer, 2010; Flowerdew, 2012). According to Boulton (2008) there are three common reasons why DDL has not been widely used in language teaching classrooms. The first reason is that both students and teachers might not be aware of DDL. Secondly, DDL might be too sophisticated and complicated as it requires technical knowledge. Thirdly, teachers may have prejudice towards using computers. Therefore, researchers suggested an alternative approach where the problems due to use of computers in language classrooms were avoided (Boulton; 2008; Römer, 2008). They suggested that teachers can choose the best concordance lines from online corpora that are appropriate for the target students and present these concordance lines to them on paper. This way, students work on the concordance lines on paper without having to interact with computers. Thompson (2006) stated that one major advantage of paper-based DDL is that it reduces the risk of overwhelming students because they do not have to deal with huge quantities of data on corpora. Hence, researchers have suggested that paper-based DDL may be helpful for students more than computer-based DDL with certain groups of students such as students with lower language proficiency (Boulton, 2010b; Smart, 2014). Researchers have been using different labels for these DDL types such as "hard and soft version of DDL"

(Gabrielatos, 2005), “teacher-corpus interaction” and “learner-corpus interaction” (Römer, 2008) and “direct and indirect consultation of corpora” (Chambers, 2007). In this study, we will name these DDL types as “direct DDL” (D-DDL) and “indirect DDL” (I-DDL).

Drawing on Vygotskian sociocultural theories (Vygotsky, 1978), collaborative learning during DDL practices is a concern of the researchers in the area. Even if there is no teacher guidance in D-DDL, they have aimed to investiage whether peer guidance is effective on decreasing the cognitive demands of D-DDL tasks. Whereas some researchers suggested that peer “scaffolding” benefits especially weaker students during corpus consultation (Flowerdew, 2008), some researchers found that weaker students might be passive during pair work when their pairs are faster in inferring from context (Vannestål & Lindquist, 2007). This may cause negative attitudes and negatively affect their motivation (Järvelä et al., 2000; Chan & Chen, 2010).

1.2 Statement of the problem

Compared to the DDL studies centralized around teaching collocations and and lexico-grammatical structures (Çelik, 2011; Daskalovska, 2015; Huang, 2014; Sun & Wang, 2003), there exist fewer studies investigating teaching new word meanings through DDL (Frankenberg-Garcia, 2012; Frankenberg-Garcia, 2014). Inferring meanings of new words from context is different from inferring lexico-grammatical structures. Inferring lexico-grammatical structures requires students to build on their existing knowledge whereas gussing word meanings from context is more cognitively demanding because it includes construction of word knowledge from scratch. Thus, further studies are needed to investigate the effects of DDL on learning new word meanings. Furthermore, these studies mostly compared DDL with traditional methods

for vocabulary teaching such as consulting dictionaries to read word definitions (Fahr et al., 2011; Lee, Warshauer & Lee, 2018; Frankenberg-Garcia, 2012). The comparative effects of I-DDL and D-DDL on vocabulary teaching has not been adequately researched yet in the literature, to my knowledge. Many researchers have called an attention to this gap in the DDL literature. Chambers (2005) highlighted the need for studies focusing on "the benefit of direct consultation of corpora by students as opposed to consultation of concordances provided by teachers" (p. 121). Moreover, Boulton (2010a) stated that "no studies to date directly compare the benefits of hands-on corpus consultation with those of prepared materials" (p. 25). Later, Vyatkina (2016) conducted an experimental study comparing the effects of I-DDL with D-DDL on students' collocational gains in German language. However, this research was about collocational gains in German language, yet there is no study comparing these DDL approaches in learning new vocabulary in English language, to my knowledge. Moreover, most of the studies in DDL literature focused on students' opinions and learning outcomes. In addition, the factors contributing to better vocabulary gains in DDL is overlooked in the literature. Therefore, a further investigation was needed to gain deeper insights into students' interaction with the I-DDL and D-DDL tasks from a comparative perspective. Another question that needs further exploration is that whether collaborative work has different effects in these different DDL practices.

1.3 Aims of the study

The current study aims to fill in the gap in the literature by focusing on the effects of D-DDL and I-DDL using a mixed-methods design. Students' learning new words at retention and recognition levels will be measured using pre-test and post-test. Moreover, with the use of think-aloud method, the study aims to have insights into how student behaviors differ between D-DDL and I-DDL. Furthermore, based on the

Vygotsky (1978)'s sociocultural theory that suggests that students learn from each other in social interactions and they provide the necessary guidance to each other to reach knowledge, this study will also compare the effects of pair-work and individual work during students' corpus consultation in their vocabulary learning. The study will also use focus group interviews to explore perceived effects of D-DDL and I-DDL and students' attitudes. To achieve these aims, the research questions addressed in the current study are:

1. How does I-DDL compare to D-DDL on vocabulary recall and recognition?
2. How does I-DDL in constructing vocabulary knowledge from concordance lines compare to D-DDL on students' corpus consultation behaviors?
    2(a). How post-test higher achievers and post-test lower achievers differ in their behaviors on task during D-DDL and I-DDL?
3. How does pair work compare to individual work in I-DDL and D-DDL practices?
4. How do students' attitudes towards I-DDL and D-DDL differ?

1.4 Significance of the study

The present study contributes to the existing literature by comparing I-DDL and D-DDL practices regarding their effects on students' vocabulary gains at recall and recognition level. Moreover, it aims to explore student attitudes towards these DDL practices from a comparative perspective. Furthermore, the current study is the only study in the literature that compares I-DDL and D-DDL through think-aloud protocol. It aims to explore what students do during both D-DDL and I-DDL practices and whether their behaviors differ or show similarities during these two approaches to

DDL. In light of the combination of think-aloud protocol and post-test results, this study also presents insights into what factors and which student behaviors during DDL contribute to higher student achievements in their vocabulary gains.

1.5 Operationalization of terms

Frequently used terms in this study are explained as follows:

DDL: Using corpora for language learning (Guilquin &Granger, 2010). To put it more precisely, students use corpus data to explore how language functions in authentic contexts.

D-DDL: Condition where students explore corpus data by directly interacting with the computer and online corpus interfaces.

I-DDL: Condition where students explore corpus data by interacting with concordance lines pre-selected by teachers or material developers and presented to them on paper. They do not interact with the computer itself.

Higher scorers: Students who received a score between 33 and 40 from their post-test total results implemented during the current study. Their post-test was out of 60 points.

Mid scorers: Students who received a score between 25 and 32 from their post-test total results implemented during the current study. Their post-test was out of 60 points.

Lower scorers: Students who received a score between 16 and 24 from their post-test total results implemented during the current study. Their post-test was out of 60 points.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter starts with describing scope of word knowledge and continues with SLA approaches to teaching and learning vocabulary in language classrooms. As the next step, the chapter introduces corpora and reviews the literature on data-driven learning (DDL) and its advantages and disadvantages along with the theories related to DDL. The chapter continuous with the description of concordance-based D-DDL and I-DDL, summarizes empirical and qualitative research on DDL and vocabulary instruction in the field, and closes with a brief overview of collaborative learning.

2.2 Vocabulary knowledge

2.2.1 Knowing a word

Vocabulary knowledge is a crucial component of foreign language learning and what is involved in word knowledge is a subject of discussion. Cronbach (1942) is one of the researchers who defined word knowledge. However, his definition focused solely on the meaning of words ignoring other aspects of vocabulary that were suggested by many researchers later on. Nation (2001) proposed the idea that word knowledge cannot be separated from the knowledge of contextual use of the words. As Nation (2001) put it, "Words are not isolated units of the language, but fit into many interlocking systems and levels. Because of this, there are many things to know about any particular word and there are many degrees of knowing" (p. 23). This “degrees of knowing” showed itself as different aspects or components of word knowledge proposed by many researchers. For instance, Richards (1976) had more inclusive assumptions compared to Cronbach’s (1942) definition and suggested three aspects of

word knowledge. He stated that word knowledge includes knowing words' associations, syntactic behavior, register, form, frequency, vocabulary growth in native speakers, and additional meanings.

Nation (1990) listed various types of word knowledge including eight aspects that are written and spoken form, meaning, frequency, grammatical features, register, collocations and associations. Nation (2001) improved his framework of word knowledge and categorized all these aspects of vocabulary knowledge into three categories as demonstrated in Table 1. Nation (2001) listed nine aspects of word knowledge that were grouped into three basic categories as form, meaning and use. He also subcategorized these aspects into receptive and productive ones in his framework.

Table 1. Aspects of Word Knowledge

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

Source: [Nation, 2001: 27]

Schmitt (2000) suggested similar aspects of word knowledge focusing on form (orthography and phonology), meaning and use (register) of vocabulary as well as grammatical constraints such as morphology and word class. Other researchers used different names to list these aspects of word knowledge.

According to Thornbury (2002), word knowledge also includes polysemes, synonyms, form, collocations, homonyms, hyponyms, antonyms and lexical fields.

Whatever the name researchers give to these aspects, their common argument is that word knowledge is about not only knowing word meanings but other aspects to words, as well. This idea puts forward two main types of level of knowledge of vocabulary, which Freebody and Anderson (1981) identified as “vocabulary breadth” and “vocabulary depth”. While “vocabulary breadth” represents “the number of words for which the person knows at least some of the significant aspects of meaning” (p. 93), “vocabulary depth” means “the quality and depth of understanding.” (p. 93). These terms also exist in Qian’s (2002) framework with two extra dimensions of vocabulary knowledge. Qian (2002) suggested that word knowledge entails vocabulary size, vocabulary breadth, lexical organization in mental lexicon and automatized vocabulary knowledge to be able to use the words in mental lexicon in reception and free production. Automaticity was also suggested by Laufer and Nation (2001). They highlighted the need for automaticity of accessing to a word, which means fluency in language production. They even prepared a test to measure fluency, namely vocabulary depth. Schmitt and Meara (1997) also believed that testing vocabulary breadth is of limited value to measure vocabulary knowledge because vocabulary breadth tests do not take multiple aspects to words into account. Therefore, vocabulary depth tests on which each word is tested on several aspects to it are needed. On the other hand, Read (2000) believes that vocabulary breadth tests can give more accurate results of learners’ overall vocabulary acquisition compared to depth tests that measure only small number of words. Laufer and Goldstein (2004) supports this point and states vocabulary breadth is more impostant. Although they

acknowledge the importance of vocabulary depth, they believed that a vocabulary test should test learner's vocabulary breadth.

Research examined so far shows that there is no agreement on what constitutes word knowledge. According to Schmitt (2010), this is one of the gaps in the field. However, there is consensus that language learners should know the meaning, form, pronunciation and use and register of a word in order to show a full mastery of target words.

Having a large breadth of vocabulary is important, but not enough in order to be able to produce language with them correctly. Thus, vocabulary size and vocabulary depth should grow together in order for vocabulary acquisition. Lee (2003) supports this argument by stating that in order to have word knowledge; learners should see, hear, understand, say and use a word. The reason is that having deeper knowledge of different aspects of words enables learners to have richer meaning representations.

Apart from the aspects of word knowledge, researchers have also made a distinction between receptive and productive vocabulary knowledge.

2.2.2 Receptive and productive knowledge of vocabulary

Schmitt (2000) and Nation (2001) puts vocabulary knowledge into two categories which are receptive and productive knowledge. Laufer and Goldstein (2004) suggest a similar idea with different concepts as "passive knowledge" and "active knowledge". While ability to recognizing the word meaning is passive knowledge, namely receptive knowledge, and recognizing the word form is active knowledge, namely productive knowledge.

The distinction between receptive and productive knowledge has been made by many researchers in defining word knowledge. Nation (2001) claims that receptive knowledge is the one about retrieving a word's meaning while listening or reading. Productive knowledge is used in speaking or writing for expressing a meaning of a word and it includes being able to write or speak the word. According to Nation (2001), productive knowledge is more difficult than receptive one due to several reasons. Firstly, acquiring productive knowledge of a word requires learning of new spoken or written knowledge about words, which does not exist in receptive knowledge. Moreover, although both receptive and productive knowledge needs practice at a certain degree (DeKeyser & Sokalski, 1996), in order to reach the production level of a word more practice is needed compared to the receptive level (Laufer & Goldstein, 2004, Webb, 2005). This idea is based on Faerch et al.'s (1984) explanation of vocabulary knowledge as a continuum starting from the basics of a word knowledge, that is visual recognition, and ending at a higher level, the ability to use the word. This idea is supported by Schmitt and McCarthy (2006) who named productive knowledge as "active knowledge" and receptive knowledge as "passive knowledge". They argued that knowing a word starts from passive knowledge (recognizing word form) and ends at active knowledge (production). When learners reach at active knowledge state, it means they have better knowledge of a word. In other words, productive and receptive knowledge can exist at the same time and reception preceeds production (Harmer, 2007; Schmitt, 2014; Pignot-Shahov, 2012); therefore, it is important to convert receptive knowledge of words into productive one to be able to use words in communication (Henriksen, 1999). Previous studies (Teichrow, 1982; Laufer, 2005; Webb, 2005; Pellicer-Sanchez, 2017) found that word knowledge at recall level was more difficult to acquire than that at recognition level as recognition requires receptive knowledge whereas recall requires productive

knowledge. However, according to Teichroew (1982), receptive and productive knowledge are interdependent on each other and which one preceeds the other depends on factors such as linguistic development and age.

2.3 Vocabulary learning and teaching in SLA

2.3.1 Learning vocabulary inductively in context

Constructivist Learning Theory pioneered by Piaget (1973) and Vygotsky (1978) and other researchers shaped some SLA research, theories and teaching practices. According to Slavin (2018), constructivist learning takes place when students were not presented the knowledge directly and they must, therefore, construct knowledge themselves. Teacher has the facilitator role and provides students opportunities to discover knowledge and ideas and help them find and use their own strategies for learning. Drawing on constructivism, Shaffer (1989) made distinction between deductive and inductive approach to language teaching. Deductive approach is a traditional way of teaching and learning in which teachers start with a general rule and then give specific examples. Inductive approach, on the other hand, teachers provide students examples for them to make generalizations and infer rules. Inquiry-based learning (IBL) is a pedagogical model that finds its basics in inductive approach, and constructivist learning theories. IBL supports the idea that students are in control of their own learning in a classroom environment where they use their pre-existing knowledge to draw connections and find answers to their own questions either with guidance or with no guidance from their teachers (Blessinger & Carfora, 2014). Inductive approaches to language learning shaped the research on vocabulary learning in SLA depending on Schulz's (1983) suggestion that students should be able to cope with authentic texts out of classroom environment on their own. Many researchers

approved the importance of guessing from context both in and out of classroom environment (Shokouhi & Askari, 2010). This way, language teachers help their students to be in "the driving seat" for their language learning journey (Flowerdew, 2015, p. 18).

Researchers noted several advantages of guessing words from context regarding linguistic and cognitive development. As mentioned earlier, it is an important skill to deal with a a text or speech that include unknown words, which leads to a lot of vocabulary learning (Nation, 2001); therefore, learners become autonomous learners when they improve their skills to deal with the unknown on their own (Dwaik et al., 2013; McCarthy et al., 2010). Cobb (1999) adds that students recall words better when they learn them inductively because they are more cognitively involved in the learning process compared to using dictionaries directly. McCarthy (1990) supports this point that a word is best remembered and internalized when it is learnt in meaningful context. Moreover, learners get the most correct idea about the register of a word and its changing meanings when they are exposed to them in different contexts. Based on Nation's (2001) idea that words are not "isolated units", we can argue that word meanings are strongly linked to context. As Meara (2002) states that "context can radically change the meaning of words, making familiar words opaque and unfamiliar words completely transparent" (p. 400). The first researcher who investigated inferring vocabulary meanings was Carton (1971) who proposed that guessing from context involves using known contextual information to guess the unknown meanings of words, namely using the familiar information to guess the unfamiliar one. He refers to this phenomenon as "informed guessing", which is an essential strategy to deal with unknown words (Nation, 2001). McCarthy et al. (2010) supported the idea that learners should be able to guess words with the use of contextual cues that they know as well as their world knowledge in order to handle

new words. However, Coady (1979) noted that guessing meanings from context correctly requires learners to know about 95% of words in the context. Hamada (2014) investigated the contextual inferring ability of the learners with different English levels and students with high intermediate and advanced levels performed better at using the contextual information. He concluded that the ability of using context clues to guess the meanings of words is highly influenced by their language proficiency. That is why the higher language level learners have, the better their ability of guessing unknown words from context become (Schmitt, 2000). According to Nation (2008), regardless of their language proficiency level, all learners need training about guessing from context.

Various researchers proposed certain steps to infer word meanings from context. For instance, Clarke and Nation (1980) propose a strategy for guessing from context involving four steps. According to this strategy, learners firstly need to determine the part of speech of the word. Secondly, they should look at the immediate grammar and consider its relations to the word's meaning. As the third step, they need to study the wider context such as conjunction relationships and lastly, they guess the word and check their guesses. This strategy presented by Clarke and Nation (1980) starts from word-level information and goes wider to sentence-level structures and combination of sentences, ignoring the contextual information on text level such as the topic of the relevant text. Sternberg et al. (1983) proposes a different "general strategy for context use" (p.139) that also includes general context and the use of students' world knowledge for inferring. Their strategy involves seven steps are as follows: 1- "attempt to infer the meaning of the unknown word from the general context preceding the word…", 2- "attempt to infer the meaning of the unfamiliar word from the general context that follows the word…", 3- "attempt to infer the meaning of the unknown word by looking at the word parts (morphology)…", 4- "if the word is

necessary in order to understand the passage which it is used, estimate how definite a definition is required, if it is not necessary, further attempts to defined the word is optional…", 5- "attempt to infer the meaning of the unknown word by looking for specific cues in the surrounding context…", 6- "attempt to consider a coherent definition, using internal and external cues, as well as the general ideas expressed by the passage and general world knowledge…", 7- "Check definition to see if meaning is appropriate for each appearance of the word in the context…". They present the steps in more detailed and comprehensible way explaining how learners will do each step compared to Clarke and Nation's (1980) strategy. Although some researchers find these steps so "vague" and difficult to understand and teach, many studies proved that teaching learners these strategies improved their ability to guess from context (Nash et al., 2006; Dwaik et al., 2013; Yuen, 2009).

2.3.2 Word attack strategies

Word attack strategies are defined by Bedell and Nelson (1957) as the skills which help learners utilize any strategy or combination of strategies to understand the meaning of new words encountered in linguistic output mostly during reading. Word attack strategies help students guess the meanings of unknown words looking at a words' parts or investigating a word from different perspectives. Word attack strategies include using picture clues, sounding out the word, looking for chunks in the word, connecting the unknown word to a known word, rereading the sentence, keep reading and using prior knowledge. Table 2 includes the detailed information about these word attack strategies.

Table 2. Word Attack Strategies

Use Picture Clues	Look at the pictures. Are there people, objects, or actions in the picture that might make sense in the sentence?
Sound out the Word	Start with the first letter, and say each letter sound out loud. Blend the sounds together and try to say the word. Does the word make sense in the sentence?
Look for Chunks in the Word	Look for familiar letter chunks. They may be sound/symbols, prefixes, suffixes, endings, whole words or base words? Read each chunk by itself. Then blend the chunks together and sound out the word. Does the word make sense in the sentence?
Connect to a Known Word	Think of a word that looks like the unfamiliar word. Compare the familiar word to the unfamiliar word. Decide if the familiar word is a chunk or form of the unfamiliar word. Use the known word in the sentence to see if it makes sense. If so, the meaning of the two words are close enough for understanding.
Reread the Sentence	Read the sentence more than once. Think about what word might make sense in the sentence. Try the word and see if the sentence makes sense.
Keep Reading	Read past the unfamiliar word and look for clues. If the word is repeated, compare the second sentence to the first one. What word might make sense in both?
Using Prior Knowledge	Think about what you know about the subject of the book, paragraph or sentence. Do you know anything that might make sense in the sentence? Read the sentence with the word to see if it makes sense.

Source: [Bedell & Nelson, 1957: 12]

Bengeleil and Paribakht (2004) conducted a study investigating the effect of EFL learners' L2 reading proficiency on their word attack strategies. They divided their 17 participants into groups based on their reading proficiency levels as intermediate and advanced groups. Participants guessed the meanings of 26 unknown vocabulary items presented in a reading text. Think-aloud protocol was used to understand which context clues or knowledge sources the participants use while they are inferring word meanings. The results of their study showed that while both groups used almost the same word attack strategies, the intermediate group used them more mostly combining various knowledge sources and context clues. These knowledge

sources and context clues were listed as word morphology, homonymy, word association, grammar, punctuation, discourse meaning, lexical knowledge, collocations, and knowledge of topic.

Tsai (2019) conducted a study using think-aloud protocol comparing learner behaviors during deductive and inductive data-driven learning activities with 100 participants. According to the results of the think-aloud protocol, inductive group participants skim and scan concordances, determine the part of speech of the target word, use the wider context function in COCA to observe words in the extended context, look at the concordances and associations translate concordance lines to guess the meaning of the word. The study concluded that participants mostly used collocations to infer meanings of unknown words.

Learning words inferring from context can occur intentionally during classroom activities studying target vocabulary items and also incidentally during reading.

2.3.3 Incidental and Intentional Learning of Vocabulary

One significant debate in SLA on vocabulary acquisition in second language revolves around two primary approaches that are incidental and intentional vocabulary learning (Hulstijn, 2003; Long, 2017; Schmitt, 2018). According to Hulstijn (2001), **"…**incidental vocabulary learning refers to the learning of vocabulary as the by-product of any activity not explicitly geared to vocabulary learning, with intentional vocabulary learning referring to any activity aiming at committing lexical information to memory." (p. 270). Laufer and Hulstijn (2001) describes the main distinction between the two approaches is based on presence of absence of learners' "intention to learn" the word. Incidental vocabulary learning

occurs when students do not aim to learn words but they learn them by chance. Although some researchers use these terms interchangeably with implicit and explicit learning of vocabulary, the difference is that incidental and intentional learning do not focus on learner consciousness but on learner intent unlike implicit and explicit learning approaches (Laufer & Hulstijn, 2001; Schmitt 2008).

Many researchers investigated the comparative effects of incidental and intentional learning approaches to vocabulary learning (Schmitt, 2008; Yali 2010; Ahmad, 2012). However, there is no agreement on which one is more effective. According to Yali (2010), intentional vocabulary learning is concerned with highly structured classroom activities that "combines with all kinds of conscious vocabulary learning strategies and means of memorizing words" (p. 74). Incidental learning is linked to learning words through reading or doing exercises that are not directly teaching vocabulary. Schmitt (2008) argues that intentional vocabulary learning contributes to quicker and better acquisition of vocabulary leading to greater success for vocabulary retention later on. Ahmad (2012) argues against this idea stating that intentional learning vocabulary learning may not be effective because learners engage in activities that require less cognitive engagement. This is because of the activity types in intentional learning approach such as multiple choice quizzes, scrambled words, crossword puzzles and word substitution. Learners may complete these activities by simply choosing to memorize the unknown words. Hulstijn and Laufer (2001) support this idea and points that learners are more engaged in deeper mental processing with incidental vocabulary learning and have greater achievements in remembering vocabulary later on. However, Ponniah (2011) argues that incidental learning is totally a subconscious process. His study with first year undergraduate students concluded that incidental learning through reading leads to better vocabulary development than intentional learning activities. Ponniah (2011) further concluded

that when readers encounter an unknown word, they find out its partial meaning for the first time. When they are frequently exposed to the word and pay attention to the general meaning of the textual content, they figure out the full meaning. In other words, whether subconscious or not, incidental learning leads to vocabulary development. As Hulsjin (2001) argued, we can say that both approaches have been claimed to increase L2 vocabulary knowledge.

Current studies in SLA vocabulary research has started to focus on how contextualized encounters in online settings such as social media, games and online corpora contribute to incidental and contextual vocabulary learning (Godwin Jones, 2018). The next section of this chapter will review research on corpora and vocabulary teaching.

2.4 Corpus and Data-Driven Learning (DDL) in vocabulary teaching

2.4.1 Defining corpus

Many scholars defined corpora in different ways. Leech (1997), for instance, defines it as "a body of naturally-occurring language (authentic) data" which is representative of the language (p. 1). According to McEnergy and colleagues (2006), corpus is a "collection of sample texts, written or spoken, in machine-readable form which may annotate with various forms of linguistic information." (p. 4). However, maybe the most comprehensive one is Hunston's (2002) definition which depicts corpora as "a collection of naturally occurring examples of language, consisting of anything from a few sentences to a set of written texts or tape recordings, which have been collected for linguistic study." (p. 2). One common quality of corpus in these definitions is that it consists of "authentic", namely representative, language data. The content of a

corpus is collected from real-life works ranging from written media such as newspaper articles, books, and academic letters to transcripts of everyday conversations. This made corpora a perfect tool for linguists to investigate linguistic patterns in real life language.

Corpus linguistics have already existed before computers since the late 19th century. Back then, language data were collected by dictionary makers on small slips of paper and organized in pigeon holes (Bennet, 2010). With the advancements of computer technology, corpora became available online leading to significant benefit for linguistic studies (Leech, 1997; McEnery et al., 2006). Corpus linguists could conduct quantitative analysis over the data by searching for a word to see how it is used, retrieving authentic examples in context, sorting the data in some way such as registerwise, and calculating its frequency of use on online corpora in fast and systematic way with the help of concordancing (Godwin-Jones, 2001).

Godwin-Jones (2001) defines concordancing as "an alphabetical listing of words in a text, together with the contexts in which they appear" (p. 9). A concordance line in a corpus lists the target word's each occurance in separate lines. Concordance lines may appear in different formats. This listing may occur in full sentence contexts or unfinished sentence contexts or in Key Word In Context (KWIC) format where "each word is centered in a fixed field, and each occurrence of the word is listed on a separate line" (Godwin-Jones, 2001; p. 9). These concordance lines give an accurate desctiption of the use of words in a variety of context including information about their collocations, associations, register, frequency of these aspects occurring in different contexts and so on (McEnery & Xiao, 2010).

Linguistics is not the only field that benefited from corpus. With its empirical and authentic nature and considerable data, corpora contributes to studies in Second Language Acquisition and provides authentic context for foreing language learners (Godwin-Jones, 2001; McEnery et al., 2006). The next section will describe a corpus approach to language teaching: Data-driven learning.

2.4.2 Data-Driven Learning

After Johns (1991) suggested that the use of corpus for language teaching could have many positive effects on foreign language learner' and teachers' way of describing a language, researchers started to acknowledge the potential of corpora for language learning purposes. A concept presented by Johns (1991), data-driven learning (DDL) involves using the tools and techniques of corpus linguistics for language learning purposes (Guilquin &Granger, 2010). With DDL, learners can explore linguistic data inductively using examples and context provided by corpus with the help of appropriate exercises and teacher guidance, hypothesize how the language works and test their hypothesis, namely 'learner becomes a researcher" (Johns, 1991; p. 2). Therefore, DDL is accepted to be inductive by nature because it allows students to explore language examples provided by corpus to gerneralize language rules or patterns. According to Chujo et al. (2009), DDL includes the steps hypothesis formation, confirm these hypotheses and follow-up exercises. This inductive approach to language learning differentiates DDL from traditional language learning practices that are mostly deductive. As Flowerdew (2012) also observes, 'DDL is usually associated with an inductive, discovery-based approach to learning in which students work out rules or probabilities from the examples provided' (p. 197). As an example, Yoon and Hirvela (2004) noted that learners can observe concordance lines to explore words' behaviors in authentic contexts.

Within this approach, traditional teacher and student roles also change in a DDL-based classroom, with teachers mediators between learners and language (Gabrielatos, 2005). As Johns (1991) states, “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), leading to more student-centered approach to language teaching. Knowledge should be “constructed” by learners but not presented by teachers in DDL (Slavin, 2018). Thus, it can be argued that DDL is firmly grounded in constructivist theories of learning in an interaction with the material itself (Piaget, 1973; Vygotsky, 1978; Flowerdew, 2015; Boulton & Cobb, 2017), which in the end promotes important language and learning skills such as fostering learners’ autonomy (Thurston & Candlin, 1998; Sun & Wang, 2003; Conrad, 2005; Tian, 2005; Guan, 2013).

According to Flowerdew (2015), noticing hypothesis presented by Schmidt (1990, 2001) and Robinson (1995) also support DDL. The noticing hypothesis in SLA advocates that “learners’ acquisition of linguistic input is more likely to increase if their attention is consciously drawn to linguistic features” (Flowerdew, 2015; p. 16). Two teaching techniques enables noticing: input enrichment and input enhancement. Input enrichment is related to learners being repeatedly exposed to target structure and DDL fosters input enrichment with its large number of language data with the target structure. This is not very possible in a traditional classroom setting. Input enhancement, the second technique according to noticing hypothesis, means emphasizing the target structure by color marking or bolding. It is realized through concordances with the target words and structures with color marking or highlighting. Overall, DDL contributes to vocabulary learning with some of its features fostering “noticing”.

Researchers suggested many benefits of using DDL in language classrooms regarding its effects on higher order skills as well as language learning (Allan, 2009). According to Johns (1991), for instance, engaging learners with authentic language from corpus data provides opportunities for students to draw more accurate and more practical conclusions about language features to using with ELT materials that are not corpus-informed. For instance, Allan (2009) suggests that DDL can be used to improve learners' vocabulary depth including knowledge about collocations, contextual behavior and register because learners have multiple exposures to words in context. Many studies concluded that students gained confidence in their writing skills (Liu & Jiang, 2009; Yoon & Hirvela, 2004), speaking skills (Geluso & Yamaguchi, 2014) and reading skills (Cobb, 1997). Moreover, thanks to its process-oriented inductive approach, DDL increases learners' mental activity, cognitive abilities, metacognitive knowledge, independent learning and academic success (O'Sullivan, 2007; Warren, 2015). Aston (2001) adds metalinguistic awareness as one of these benefits. Mair (2002) expresses that learner is "empowered" with higher self-confidence and self-esteem (Gilquin &Granger, 2010). This increases their satisfaction during language learning and motivation (Gilquin & Granger, 2010; Boulton, 2010a).

Student attitudes towards using concordances have been mixed. Chambers (2007) concluded that students responded positively to the use of authentic materials and inductive activities. Yoon and Hirvela (2004) and Vannestăl and Lindquist (2007), however, found that students showed negative attitudes towards both learning to use corpus tools and towards dealing with technological problems during DDL. Some other studies also reported that DDL has certain drawbacks. One of the important drawbacks is that, inductive learning activities may not be suitable for every language learner (Flowerdew, 2012). This is also because of the fact that students are not used to inductive language learning activities that are not very common in traditional

classrooms and they find it time-consuming compared to receiving the rules immediately from their teachers (Chan & Liou, 2005; Balunda, 2009). Therefore, there is a need for sufficient training and teacher guidance on how to use corpus with DDL (Gavioli, 2001; Braun, 2005; Boulton, 2009; Frankenberg-Garcia, 2012; Karras, 2016). According to Gilquin and Granger (2010), this training should include preparing students to use the corpus interface and training students how to interpret corpus data.

Gilquin and Granger (2010) categorizes the disadvantages of DDL intocategories as “logistics”, “teachers’ point of view”, “learners’ point of view” and “content”. “Logistics” means that computers and sometimes paid software applications are needed for DDL activities. Moreover, time and effort for traning students and preparing DDL materials are also requirements. “Teachers’ point of view” means that teachers may not be aware of DDL or their roles during DDL activities. “Learners’ point of view” is concerned with learners’ attitudes towards corpus use. They may find it too complicated or cognitively demanding. Lastly, “content” refers to the fact that the content derived from corpus may be unsuitable or linguisticly complicated for students.

Research about the effects of corpus use on different aspects of language learning is still a heated discussion in SLA. The next section of the literature review will present a brief discussion on the effects of DDL on vocabulary learning.

2.5 DDL and vocabulary learning

DDL presents an innovative student-centered way in English vocabulary teaching. Read (2010) also states that, it is very natural to use corpora in vocabulary teaching thanks to the nature of corpora. In their meta-analysis, Bolton and Cobb (2017) reviewed 64 DDL studies most of which investigated the effects of DDL on

vocabulary and lexico-grammatical patterns such as collocations. The reason why the majority of research focuses on these language forms are most probably because corpora makes language regularities easily observable. As Allan (2009) puts it, "For lexical learning, it is particularly helpful in that it gives learners multiple exposures to words in context, offering potential for deepening word knowledge through the information provided about collocations, contextual behaviour, and register. It would appear to be a valuable explicit 'focus on form' technique." (p. 24). Thus, many DDL studies found positive effects on teaching collocations (Sun & Wang, 2003; Chan & Liou, 2005; Çelik, 2011; Tsai, 2011; Huang, 2014; Daskalovska, 2015; Vyatkina, 2016). The positive effects of corpus on vocabulary learning is not restricted to lexico-grammatical features. Corpora also provide information about frequency of target words in different contexts (Quan, 2016). According to Moon (2010), reading concordance lines raise students' awareness of variation of words meanings on variety of contexts. Lee et al.'s (2018) recent study showed that corpus use contributes more to vocabulary depth such as collocations rather than word definitions or productive word knowledge.

While the majority of DDL research focuses on teaching lexico-grammatical patterns, few studies focus on learning new vocabulary through DDL. Tsai (2019) argues that inferring word meanings from scratch and inferring lexico-grammatical patterns are not fundamentally the same, because learners rely on their existing knowledge inferring lexico-grammatical features while they construct knowledge of new words from scratch. They generalize recurring lexico-grammatical features they observe in KWIC condordances very easily, but guessing meanings of the words from context requires much more cognitive effort than generalizing if the word is entirely unknown to the learner. This is even more difficult for the learners considering the fact that learners are not used to inductive ways of learning but deductive ways as

discussed earlier in this chapter. This can cause frustration and demotivation during DDL tasks (Sha, 2010). Laufer and Hulstijn (2001) and Cobb (1999), on the other hand, argue that greater achievement in vocabulary retention occurs thanks to higher learner involvement and deeper cognitive processes while dealing with inferring word meanings from context. The repeated exposure to the target word in variety of contexts provided by corpus give learners the chance to guess word meanings more successfully because seeing how words differ in different contexts gives better understanding of word meanings (Schmitt, 2000; Nation, 2001; Nation, 2009; Gardner, 2013). However, sometimes concordances in DDL tasks can cognitively be too difficult to handle. That is why teacher guidance is obviousy needed during DDL (Clifton & Philips, 2006). Reppen (2011) suggests that this guidance can be in the form of systematical selection of relevant and necessary portions of the corpus data in order to prepare I-DDL activities.

Leech (1997) suggested that DDL can be used in classrooms in two different ways: either with computers or on paper. The next section will compare these approaches to DDL in more details.

2.6 Direct DDL (D-DDL) and indirect DDL (I-DDL)

Corpora can be used in English language teaching in many ways. Material developers create improved reference materials based on corpus data such as grammar books, dictionaries, and textbooks. They can create wordlists such as Coxhead (2000)' Academic Word List (AWL) that includes the most frequent academic words. Corpus data, in this sense, helps teachers and content creators to prioritize the most useful and relavant vocabulary in their language classrooms. However, these areas of corpus use will not be the focus of this study. The current study will focus on the two different ways of integrating DDL into language learning practices (Chambers, 2010).

Both D-DDL and I-DDL approaches foster inductive learning; however, the difference is that students directly interact with online corpus tools or interfaces in order to explore language data in D-DDL. In I-DDL, however, teachers instead of students, use online corpus interfaces, gather linguistic data from them, prepare "paper-based" I-DDL activities and have students work with these materials to explore language patterns (Reppen, 2011).

The potential preferences for I-DDL can be related to some of the drawbacks of using online corpora in DDL practices. Although D-DDL may be preferred because it provides extensive data for discovery-learning, students' needs for extensive training for corpus use and lack of computers at schools and complicated corpus interfaces can hinder the implementation of it. Therefore, relatively easier operationalization of I-DDL activities can make it more attractive for language teachers. In I-DDL, it is only the teacher who needs to have an access to online corpora and the skills of using it (Bernardini, 2004). Moreover, as Boulton (2009) argues, DDL favors more the higher-level students than lower-level ones because sufficient linguistic knowledge is necessary to deal with authentic data in concordances that most probably involve too many unknown words (Cobb, 1999; Chambers, 2007; Balunda, 2009). Boulton (2011) also emphasized that D- DDL is more suitable for advanced level learners by describing it as "the hands-on use of authentic corpus data (concordances) by advanced, sophisticated foreign or second language learners in higher education for inductive, self-directed language learning of advanced usage" (p. 572). Even if the students have advanced level of English, they still may find the search technique and the format in which programmes display concordances very confusing and difficult to interpret (Koosha and Jafarpour, 2006; Yoon and Hirvela, 2004). The alternative that take these drawbacks out of equation is I-DDL that gives teachers control over the concordances that students will work on.

They can choose to include the best concordances for their specific target situation and target student groups in order to provide even lower level students with meaningful and non-distracting input. Hence, students with low level of English can also benefit from corpus data with the help of I-DDL activities (Boulton, 2010a). In other words, preparing I- DDL materials based on corpus data allows teachers to make sure that the material is appropriate and relavant to the students.

Preparing I-DDL materials may meet students' needs and expectations better than D-DDL practices as it gives teachers the chance to make changes or adaptation necessary for the target students. For instance, teachers are able to edit the concordances to make them easier for the students (Tribble & Jones, 1990; Bernardini, 2004). Several criteria have been suggested to perform manipulation. Readability, for instance, supports discarding the most difficult concordance lines (Kuo et al. 2001). Frequency is another criterion that allows keeping the concordances that show the most frequent uses (Levy, 1990). Simplification means editing the concordances to simplify its language for lower level students (Gabrielatos, 2005). Usefulness, lastly, is about keeping the concordance lines if you believe that they are the most useful for learning (Tribble, 1997). The next question is whether these concordances should be manipulated or should be used as it is. Boulton (2009) does not support manipulation of the concordances because it distorts the "authenticity" advantage of DDL. According to Römer (2008), it is the most significant benefit of DDL and using corpora in language classrooms give the best picture of appropriate and correct use of vocabulary, grammar and functions in natural settings (McEnery & Xiao, 2010), which contributes to students' productive vocabulary knowledge. Furthermore, Gabrielatos (2005) points out that it is difficult to give an accurate picture to the learners about the frequency of the words when concordance lines are manipulated. Some other researchers argue that D-DDL provides learners much more concordance

liens for any word they want to investigate (O'Keeffe & McCarthy, 2010). That gives students chance to choose the concordances they find easier. As Chambers (2005) suggests, when one concordance line is too difficult for students' language proficiency level, they can easily move on to another one which may be easier for them. Moreover, they can see the wider context by clicking on the concordances to guess the meanings of words more easily.

Another question is the degree to which I-DDL provides context that is helpful for guessing word meanings correctly and easily. It can be argued that I-DDL gives limited access to corpus data. Flowerdew (2005) puts forward the idea that the concordance lines derived from their extended contexts are decontextualized. This increases the difficulty level of DDL activities for the acquisition of new vocabulary. Moreover, edited and limited data in I-DDL can hinder learners' further discoveries. This is called "serendipitous learning" by Bernardini (2000) and it can foster incidental learning. This is a concept that is very similar to Aston's (2001) concept called "curiosity-driven corpus search". According to Aston (2001), it is possible for students to further exploit language data because of their curiosity when they use online corpora, namely during D-DDL activities. Thus, they may acquire wider variety of linguistic and/or cultual knowledge as a result of this incidental learning. Breyer (2011) describes this curiosity-driven further discovery as one of the richest potentials of corpora for language learning.

There are ongoing arguments on whether I-DDL and D-DDL are equally effective or not. There seems to be an argument that I-DDL can be valuable in itself (Johns, 1991; Huang, 2014). Some researchers believe that it offers similar advantages to D-DDL practices for language learning (Jalilifara et al., 2014). Other researchers support that I-DDL can be supplemental to D-DDL activities (Frankenberg-Garcia, 2005; Breyer, 2006) by having students work with D-DDL at school and give students

handouts for further study at home as I-DDL practices (Charles, 2007). Boulton (2010b) and Johns (1997) suggest that I-DDL can be a transitional step to train learners for D-DDL. Students ultimately be taught how to use online corpora to foster learner autonomy in language learning. The next section will give an overview of the research on D-DDL and I-DDL, their effects compared to traditional methods and their comparative effects on vocabulary learning along with student opinions.

2.6.1 Studies on D-DDL and I-DDL for vocabulary learning

As discussed earlier in this chapter, most of the DDL experimental studies on vocabulary learning focuses on teaching lexico-grammatical structures such as collocations. Chan and Liou (2005), Chen (2011), Çelik (2011), Daskalovska (2015) and Huang (2014) have run experiments in their studies comparing D-DDL with traditional methods on teaching different types of collocations and shown that DDL is more beneficial to teach proper use of collocations. In opposition to these findings, Akıncı and Yıldız (2017) found in their experimental study that explicit instruction was more effective than corpus consultation in teaching verb-noun collocations. However, the questionnaire they conducted with their participants showed that students believed corpus consultation was more effective than explicit instruction in learning verb-noun collocations. Frankenberg-Garcia (2014) compared I-DDL with several concordance lines and I-DDL with a single concordance line in teching collocations in L1 Portuguese setting. She concluded that I-DDL with several concordance lines led to better results in teaching English collocations to L1 Portuguese learners. In addition to these studies comparing traditional methods with DDL in teaching collocations, there are some research comparing the effectiveness of D-DDL and I-DDL, as well. Vyatkina's (2016) study is one of these studies that compared I-DDL with D-DDL in teaching collocations in German language. She

examined the immediate and delayed performance gains of the students and found no significant difference in their effects on students' learning. She also compared students' perceptions of these DDL practices and suggested that both DDL types were equally effective for all learners on the condition that there were teacher and peer scaffolding. No research reviewed on comparative effects of D-DDL and I-DDL on learning collocations in English language teaching.

Relatively few studies focused on learning new vocabulary through DDL in English language teaching. Moreover, these studies mostly compared DDL methods with traditional methods, yet there is no research comparing I-DDL and D-DDL in teaching new vocabulary. Stevens' (1991) study was the first study that investigated the effects of concordance-based vocabulary activities in comparison with traditional vocabulary activities and he found that concordance-based exercises were effective in improving students' competence in semantic and syntactic elements of the target language. The limitation of his study was that it did not have an experimental design. Tom Cobb (1997) conducted one of the earliest experimental studies that investigated the outcomes of acquisition of new vocabulary of his students when they learn words looking at multiple concordances and when they read a single sentence with a short definition of the word. His study showed that the former group improved their vocabulary knowledge more. Cobb (1999) had a follow up study with twenty adult Chinese students who learn English. He had two different experimental conditions that are concordance-based vocabulary learning and traditional vocabulary learning such as dictionary consultation. The results revealed that the former led to better results in participants' vocabulary gains. He added that concordance-based vocabulary learning contributed to productive vocabulary knowledge, as well. Later, Horst, Cobb, and

Nicolae (2005) conducted a study together that analyzed the effect of D-DDL on students' vocabulary learning in ESL context. They reported that students could learn vocabulary meanings as well as their semantic, syntactic and collocations.

Boulton (2008, 2009) conducted number of experimental studies with lower-level students comparing I-DDL with traditional methods. He focused on the effects of I-DDL on phrasal verbs (Boulton, 2008) and linking adverbials (Boulton, 2009). The results of both of the studies favored I-DDL more than traditional methods in vocabulary teaching. Boulton (2010b) also tested the effects of I-DDL and traditional methods in learning multiple dimensions of word knowledge. He investigated the effects of I-DDL on constructing word knowledge including semantics and lexico-grammatical structures of them based on Nation's (2001) word knowledge framework. The pre-test and post-test design of his study showed that I-DDL group performed better compared to the control group. Based on his data from questionnaires, he also argued that I-DDL with preselected inductive activities based on corpus data may be more effective with lower-level learners compared to D-DDL, although D-DDL contributes to more autonomous and life-long learning. Similar to Boulton's (2010b) study, some other studies examined the effects of DDL on multiple dimensions of word knowledge at the same time, but this time focusing on D-DDL in experimental group. Çelik (2011), for example, investigated the effects of D-DDL with traditional methods, using online dictionaries, on teaching academic words and prepositional phrases. 68 EFL students studying at a faculty of medicine participated in this 5-session study. D-DDL group performed higher in retention tests; however, there was no significant difference between the two groups on post-tests. In Tsai's (2019) study, she investigated how learners construct the knowledge of new vocabulary with D-DDL and deductive DDL approaches. A hundred students at a university in Taiwan participated in the study. The study focused on multiple aspects to word knowledge

using Nation's (2001) word knowledge framework. The results from pre-test and post-test and also think-aloud protocols revealed that D-DDL is better at developing collocational knowledge. However, deductive approach was better for teaching meanings of unknown words. Among the studies in Turkey's context, Ergül (2014) compared I-DDL with traditional methods on vocabulary learning and found that I-DDL was more effective. Kazaz (2015) also conducted research with 82 EFL students. She explored the effectieness of I-DDL with traditional methods on teaching vocabulary. The results showed that I-DDL was more effective.

Frankenberg-Garcia (2012) investigated the retention of unknown words using I-DDL activities. She had two groups in her study one of which learned words with dictionary definitions. Another group was provided single concordance with the target word in it and the other group was given multiple concordances. After the pre-test and post-test evaluation of receptive and productive knowledge, she concluded that multiple concordances were more helpful than a single concordance and definition only in productive vocabulary knowledge. However, there was no significant difference between the definition group and multiple example groups in receptive vocabulary knowledge.

In DDL studies, students' perspectives about DDL is one of the concerns. One of the many studies investigating students' attitudes and beliefs toward DDL is Aşık et al.'s (2016) study. They introduced corpus and corpus data to students and used questionnaires and focus group interviews to uunderstand their beliefs about D-DDL regarding vocabulary development and lexical awareness. The results showed that they had positive attitudes towards DDL in terms of their awareness for synoynms and collocations. However, they stated that there was no difference in their awareness for frequency, idioms and vocabulary laerning strategies after corpus use. Students were not happy about technical problems of corpus interfaces and time-consuming nature of

DDL tasks. Similarly, Chujo et al. (2013) explored beginner level students' attitudes towards DDL practices, but this time for both D-DDL and I-DDL on learning NPs and VPs. Students found I-DDL less time-consuming and more practical because they were given the best concordances and they could study on paper easily by, for example, underlying important parts. As for D-DDL, students found it better for memorizing lexico-gramatical structures because they were more "active" in their learning process. The study shows that even lower-level students can benefit from D-DDL practices but it is important to consider that Chujo et al.'s (2013) study used a corpus that is built by the teacher using student writings. Thus, it can be argued that with careful selection of corpus interfaces, all students can benefit from D-DDL.

In order to understand what students actually do when consulting corpora for DDL, tracking and characterisation of students' corpus searches and corpus use is important. Chambers and O'Sullivan (2004) manually tracked corpus use of 8 advanced learners of French while they are revising their academic writings. They wrote their actions while they use online corpora on a paper. Although this tracking was made manually, there are studies using technology to track users' behavior. Hafner and Candlin (2007), for instance, used this in a writing class with a platform to track user IDs, date and time of access to corpora, search queries, referring pages and the corpus and subcorpus searched. Chan and Liou (2005), in their study investigating the effects of corpus-based collocation learning, tracked the words participants looked up in the corpus, how many times participants searched for each word was and also their answers. Pérez-Paredes et al. (2011) also tracked the number of actions performed by students, corpus activities completed and corpus queries during students' corpus consultation during writing revision. Current think-aloud protocols are adopted to track corpus users' verbal reports on task (Ericsson & Simon, 1993) and screen-recorders also help to track students' behaviors on corpus interfaces. As one of the

earliest example of this method, Tsai (2019) used the think-aloud protocol to capture thought processes of 100 lower-level students at a Taiwanese university during their corpus and dictionary consultation to learn vocabulary meanings and collocations. She aimed to explore which aspects of word knowledge based on Nation's (2001) framework students paid attention to. He also focused on learners' strategies during COCA corpus consultation, as well. With a preliminary and thematic coding scheme on the verbal reports and scene-recordings of the participants, she found that learners try to infer meanings by first looking at the word's part of speech, then clicking on extended context in COCA. They later try translating the concordances to infer the meanings of unknown words. If they cannot find the meanings in this stage, they try to infer meanings from assosiations. Dictionary consultation group, on the other hand, did not need to infer meanings because they were directly provided by definitions. That is why they did not contribute verbal reports during think-aloud protocols. Although this study greatly contributed to the literature showing how students find meanings of words during corpus consultation, it does not give information about the difficulties students experience during their corpus consultation. Sometimes students can have wrong inferences of word meanings, and the reasons for these can also be observed during think-aloud protocols. Moreover, there is no study with think-aloud protocols with inductive I-DDL tasks.

Although there are a lot of studies comparing both D-DDL and I-DDL practices with traditional methods, there is no study focusing on the effects of D-DDL compared to I-DDL in learning new words. Boulton (2010b) noted that "no studies to date directly compare benefits of hands-on corpus consultation with those of prepared materials" (p.25) especialy for construction knowledge of new vocabulary.

2.7 Collaborative learning

Collaborative learning refers to any type of learning that occurs when students work together or in an interaction with their teachers to complete a task or arrive at a conclusion. Stahl (2006) defines it as "a process of constructing meaning" (p. 318). Collaborative learning activities in language classrooms usually occur as pair-work and group-work activities. This notion of collaborative learning is based on Vygotsky's (1978) sociocultural theory of human learning and his concept of *zone of proximal development (ZPD).* Vygotsky (1978) argues that people construct knowledge through social interaction with other people. Unlike the learning processes that take place alone, cooperations and collaborations among learners enable them to benefit from the others that are more competent to construct an understanding of new concepts. In other words, with the help of this collaboration, learners move on from their current level to higher level of knowledge. This support from peers or teachers is called "scaffolding" (Vygotsky, 1978). However, potential learning amount of every individual has its limits. This is related to the concept ZPD which can be defined as the distance between what an individual can do and the potentially what will be able to do with peer scaffolding (Vygotsky, 1078). Scaffolding is an effective strategy in helping students reach the higher level in their learning with guidance and support through discourse discussions, hints, think-aloud modelling and prompts (Vygotsky, 1078; Hartman, 1997).

2.7.1 Collaborative learning and DDL

As many researchers showed that students have trouble in their corpus consultation and need guidance for using corpus interfaces, inferring meanings from context and hypothesis-testing in inductive activities (Gavioli, 2001; Braun, 2005; Conrad, 2005; Boulton, 2009; Frankenberg-Garcia, 2012; Karras, 2016; Clifton & Philips, 2006),

integrating collaborative activities into DDL practices is focus of some research in SLA research (Flowerdew, 2008, Gavioli, 2001).

In order to make inductive DDL practices helpful for all learning styles, learners need "scaffolding" to support them during classroom practices with constructivist approaches (Kirschner et al., 2006). Carter and McCarthy (1995) were the first to suggest the idea of interating collaboration into corpus-based teaching and learning. They described three stages of an effective learning through corpus consultation. These stages are first "illustration" which means observing concordances and corpus data for linguistic evidence. Second step is "interaction" where occurs students' collaborative work on corpus data to share their own observations with peers or teachers. Last stage is "induction" meaning inferring linguistic rules. In other words, according to Carter and McCarthy (1995), students need to discuss their own findings about the corpus data before they make generalizations about the use of language. In the light of this suggestion, researchers investigated whether collaborative learning make DDL practices more effective for students.

Drawing on Vygotskian sociocultural theories, Vannestål and Lindquist (2007) conducted a study with first-year university students in Sweden. They integrated pair activity into learners' corpus consultation in L2 grammar instruction. Learners tried to infer grammar rules from corpus data in pairs and then they discussed their findings with another pair of students. The results from questionnaires and interviews showed that students found pair work difficult especially in interpreting the concordances. They concluded that peer collaboration might not be an effective way to help learners through corpus consultation. On the other hand, Flowerdew's (2008) study showed that group work benefited corpus consultation especially for weaker students in groups. His study adopted peer response activities during DDL activities for writing. "Scaffolding" took place when students with higher language proficiency in groups

helped less proficient students. During the group activities, higher level students shared their interpretations of corpus data and lower level students built knowledge during their discussion. However, these differences between students in their language proficiency as well as their characteristics and goals may cause conflicts. This may cause negative attitudes and negatively affect their motivation (Järvelä et al., 2000; Chan & Chen, 2010). However, more studies are needed to understand the factors that affect learning during DDL practices.

CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter presents the design and procedure of the current study. It provides information about participants, study context, selection of target words, criteria for material development for each study group, and instruments for data collection. Furthermore, it describes the details of data analysis procedures.

3.2 Participants

Participants in the current study were 59 students who were newly registered in the English preparatory program of a private university in Turkey. Seven of these participants dropped out of the study because they did not attend either of the interventional sessions. Therefore, data from these participants were removed from the study. Out of the remaining 52 students, 28 participants were in the D-DDL group and 24 of the participants were in the I-DDL group. Their ages ranged between 18 and 32. Their average was 19. Twenty-three of these students were female and 29 of them were male. All of the students were native speakers of Turkish. Their English proficiency level was detected as intermediate based on Cambridge English Placement Test administered by the institution that assessed students' reading, writing, listening, vocabulary and grammar skills.

They had 22 hours of face-to-face English instruction every week. Students needed to pass a proficiency exam at the end of the academic year in order to start studying in their departments in the following year. The proficiency exam they were supposed to take assesses their language skills in reading for main ideas, reading for specific information, listening for specific information, note-taking listening, and

academic essay writing skills as well as paraphrasing. Thus, their courses in the preparatory program aimed to teach English for academic purposes, English for general purposes and English for specific purposes related to their departments. Their departments varied from Economics, Nursing, Digital Game Design, Radio, TV and Cinema, Pharmacy to Interpreting Studies, and International Trade.

The majority of the students were graduates of private high schools in Turkey. Only three of the students reported that they knew other languages such as German and Arabic. Most of them reported that they had never been abroad and they were eager to travel abroad for touristic and academic purposes. Hence, they were eager to learn English and other foreign languages such as Chinese, Spanish, German and Japanese. They were familiar with some online educational tools and websites to practice English during lessons such as *Kahoot* and outside of the classroom such as *Cambly*, *Duolingo* and *Busuu*. Results from a background questionnaire showed that more than half of the students in the current study use online applications to improve their vocabulary such as *Memrise.* Half of the students reported that they learn vocabulary by consulting dictionaries and memorizing lists of words and the other half of the students stated that they simply read a lot or watch TV series and play computer games to improve their vocabulary. Most of the students reported that they were confused about how to learn vocabulary most effectively and needed suggestions. The results of the background questionnaire are to be presented in more detail in the *Results* chapter.

3.3 Context

The present study examines the effects of D-DDL and I-DDL on constructing academic vocabulary knowledge. Thus, participants were randomly assigned to two experimental groups: D-DDL and I-DDL groups. Participants in both the groups studied the same target vocabulary items inductively. They tried to discover their meanings using concordance lines from corpora. The difference between the groups was that 28 participants in the D-DDL group interacted with online corpora interfaces to explore word meanings using computers in the computer lab of the university. On the other hand, 24 participants in the I-DDL group examined concordance lines derived from corpora on a worksheet prepared by their teachers. They did not interact with online corpora interfaces. In other words, while I-DDL participants had teacher guidance in the form of a selection of the concordance lines based on some criteria, such as presenting concordance lines that included fewer unknown words to the participants, the D-DDL group did not have this teacher guidance.

In order to investigate the differences between these two DDL practices, four interventional sessions were carried out for both the groups. They studied the same four words a week during these interventional sessions, which made 20 target words in total. During the first two sessions, participants studied the words in pairs and during the other two sessions, they studied the words individually. This was to investigate the effects of peer guidance on vocabulary learning in both the groups. Before the interventions, they needed training. Both of the groups had training on how to guess word meanings from context. However, D-DDL group needed training on how to use online corpus interfaces, as well. Pre-test post-test, think-aloud protocols and focus group interviews were carried out in order to obtain data. Table 3 summarizes the interventional steps in the current study. However, the detailed procedure of the study will be presented later in this chapter.

Table 3. Interventional Steps of the Study

Weeks	Procedure
Week 1	Completion of consent forms
Week 2	Training on corpora, use of corpora (COCA and MICASE) and guessing from context Assignment of searching given words on corpora using provided guidelines
Week 3	Administration of pre-tests Training on use of corpora in computer lab Modification of instructional materials Development of tests
Week 4	The first interventional session with pair-work
Week 5	The second interventional session with pair-work
Week 6	The third interventional session with individual work
Week 7	The fourth interventional session with individual work
Week 8	Administration of post-test Meetings for think-aloud protocol
Week 9	Focus group interviews

3.4 Target words

The target words for the current study were selected from Coxhead's (2000) Academic Word List (AWL) which is also a corpus-informed wordlist. AWL is consisted of the most frequently occurring 570-word families in general academic discourse, regardless of discipline. This list was created by Coxhead (2000) in order to inform language teaching. He aimed to be able to teach the most relevant, the most useful, and the most frequent words to the students first. The words in the list were chosen based on these three principles. The higher frequency the words have, the higher the chance to encounter them for the students in their target situation. As Nation (1990)

also suggests “learners of English as a foreign language need a productive knowledge of at least 3000 high-frequency English words in order to be able to cope with university reading tasks” (p. 24). Hence, the target words of this study were selected from AWL for pedagogical purposes. These words were relevant and useful to the participants because they needed to improve their academic vocabulary to be able to perform in their departments in the following years.

The target words in the current study were not chosen randomly from AWL. In the first stage, the researcher chose 50 words from AWL that the participants probably did not know considering their language proficiency level. All the participants completed a 50-item vocabulary pre-test based on vocabulary retention and recognition of these randomly selected words. Thirty-two of these 50 words that were not known to all participants were detected. Out of the remaining 32 unknown words, 20 lexical items were selected randomly as target vocabulary. Appendix A presents the full list of target vocabulary selected for the current study.

3.5 Material development

Both of the experimental groups needed to study the target words using corpus data. While the D-DDL group needed to have direct interaction with the corpora using computers, the materials of the I-DDL group were prepared by teachers using corpus data. As the corpora to be used in both of the groups, COCA (Davies, 2008) and Michigan Corpus of American Spoken English (MICASE) were chosen. The rationale for selecting COCA is that it is a freely available and large academic corpus consisting of a variety of academic written texts such as articles, blog entries and newspaper articles. It provides information about the frequency and register of the words. It shows the wider context of the concordances with one click. Students can also access image representations and pronunciations of the words easily. Another pedagogically

important quality of COCA is that it highlights collocations with different colors and shows concordances with search words highlighted, which contributes to the easy acquisition of new words (Schmidt, 2001; Flowerdew, 2015). Therefore, many researchers have used COCA as the source corpus in their DDL studies (Çelik, 2011). In one study, however, Geluso and Yamaguchi (2014) found that students experience some difficulties using COCA such as encountering unfamiliar vocabulary and cut-off concordance lines and they believed it is not user-friendly. That is why MICASE is also presented to the students in the D-DDL group. It has a relatively simpler and easier interface for novice users to see the results of a word query. MICASE is a spoken corpus that includes concordances from naturally-occurring academic speech, presentations, and dialogues. It shows information about speakers such as their gender, age or nativeness and the context for the speech such as academic discipline and duration. It has also a "view more context" function that shows the transcript of the speech. Unlike COCA, MICASE shows concordances in KWIC view that may foster noticing of vocabulary items because it is strongly related to "input enhancement" (Schmidt, 2001; Chapelle, 2003). However, Kennedy and Miceli (2001) and Yoon and Hirvela (2004) found that KWIC view may be very confusing and difficult to interpret for some students. Therefore, COCA and MICASE will complement each other, and students in the D-DDL group will have the opportunity to choose one of them for their vocabulary learning. Moreover, because students are exposed to two different text types and genres in spoken (MICASE) and written (COCA) corpora, they are more sensitive to language variation (Gulquin & Granger, 2010).

Having selected the corpora to be used, worksheets for 4 interventions were prepared for both D-DDL and I-DDL groups. Each worksheet for each interventional session aimed to teach five words from the target vocabulary list.Table 4 demonstrates the target words chosen for each interventional session.

Table 4. Distribution of Target Words into Each Interventional Session

Intervention	Target Words
Session I	Derive, Comply, Convert, Compensate, Cooperate
Session II	Prior, Distinct, Outcome, Conflict, Reluctance
Session III	Consult, Fund, Access, Accompany, Interaction
Session IV	Inherent, Complement, Consent, Behalf, Adequate

For both of the groups, worksheets were based on inductive inquiry-based learning of vocabulary, not on a deductive approach. The reason is that Tim Johns (1997), the pioneer of this approach, describes DDL as a discovery-learning, and learners are considered as "language detectives" (p. 101) or as Bernardini (2004) suggests students become researchers. In DDL activities, corpus examples are starting points and they are used to make generalizations about language and language used by the students themselves.

For the D-DDL group, worksheets for each intervention included a list of the five target words for that session. These target words were presented under one column of a table as a graphic organizer to guide students and the other column was left blank for the meanings of words. Students were instructed to search for the target words on COCA and MICASE one by one and use concordances to come up with their meanings and write them under the "meanings" column.

The instructional materials prepared for the I-DDL group included the same vocabulary. However, in their worksheets, there were also 10 concordances from COCA and MICASE for each target word. The rationale behind choosing 10 concordance lines was to provide the students an accurate picture of the frequent use of the target words (Levy, 1990). As suggested by Schmidt (2001), "input enrichment" and "input enhancement" were achieved in order to foster noticing and learning of the target words. Including 10 pieces of concordance lines on I-DDL worksheets ensured "input enrichment" since students were exposed to target words in a variety of authentic contexts in those 10 concordance lines. Moreover, the target words were highlighted in these concordances to ensure "input enhancement". Later, students were instructed to guess the meanings of the target words from the concordance lines on the worksheet and write them under the "meanings" column of the table. Appendix B provides all the instructional materials for the D-DDL group, and Appendix C includes all the instructional materials for the I-DDL group.

I-DDL materials were prepared with the purpose of making concordances from corpora more meaningful and non-destructive for the students based on Reppen (2011)'s suggestions. For instance, Johns (1986), Koosha and Jafarpou (2006) and Yoon and Hirvela (2004) suggested that concordances as "unfinished sentences" cause difficulty for students to interpret data. Therefore, concordances in the worksheet were presented as full sentences. Some manipulation was performed based on the suggestions of Levy (1990), Tribble (1997), and Kuo and colleagues (2001). For instance, the most difficult concordances considering the language level of the students were not included in the worksheet. However, concordance lines were not edited to simplify their language (Gabrielatos, 2005) as it hinders the authenticity of the language (Boulton, 2009). Furthermore, the concordance lines that showed the most frequent uses of the target words, such as frequently used collocations and

frequent contexts, were included. Lastly, concordance lines that were judged the most useful for learning were included in the worksheets. For instance, the concordance lines that were the most representative of the meanings of the target words were chosen. They were aimed to reflect the word meanings the most clearly. For this criterion, students' interest areas were also considered. In order to make these decisions reliable, three teachers agreed upon which concordance lines should be kept in the worksheet. One of them was the researcher of the current study as well, two of these teachers were co-teachers each of whom instructed participants nine hours a week. They knew students very well. The other teacher did not teach the participants but she was an English teacher in the same institution.

3.6 Instruments

Three different data collection methods were utilized in the current mixed-methods study. Pre-test and post-test were used to compare quantitatively the learning achievements of both I-DDL and D-DDL groups. Secondly, the think-aloud protocol was used to have an understanding of students' actual behavior on task. Lastly, focus group interviews were preferred to gain insights to students' opinions and preferences about the use of DDL tasks in a language classroom.

3.6.1 Pre-test and post-test

In order to answer the first and fourth research questions, the current study utilized meaning recall, form recall and meaning recognition tests. These tests measured participants' learning of the target words and compare the learning achievements of D-DDL and I-DDL groups. These three tests were used both as pre-test and post-test. Translation tests were utilized as meaning recall and form recall tests. In the meaning recall test, students were provided with the target vocabulary items and they were

asked to provide their Turkish equivalents since Turkish was the native language of all participants. However, students were also allowed to write the definitions of the target words in English if they can express the meanings that way better and more comfortably. On the other hand, in the form recall test, students were given the Turkish equivalents of the target words and they were asked to come up with the target words. Both the meaning recall test and form recall test were proved to be reliable by Cronbach (1951) with an α value of .83 for the meaning recall test and α value of .81 for the form recall test. These alpha values were calculated using SPSS and an alpha value above .7 is considered reliable yet a value .8 and above was accepted as a better and ideal value for internal reliability (Cronbach, 1951; Cortina, 1993). Below are examples of the test items in meaning recall and form recall tests as they appeared on the test papers:

Meaning recall test item:

investigate _____

Form recall test item:

araştırmak _____

In addition to recall tests, a meaning recognition test was also administered in which students were provided with the target words and asked to choose their meanings from three options (Goldstein, 2011). This was a typical multiple-choice question exam to measure students' receptive knowledge of the target words. This made the recognition test a good complement to recall tests that assess productive knowledge of target words. Below is a meaning recognition test item:

1. *investigate*

   a.doğrulamak

   b.araştırmak

   c.dönüştürmek

The same tests were utilized as pre-test and post-test in the study. The only difference was that pre-test involved 50 vocabulary items. The words that any student recalled or recognized were discarded from the target vocabulary list before the intervention because the study aimed to measure vocabulary learning that is completely new to all the students. Post-test consisted of 20 target vocabulary items that were detected as new to all participants in each post-test. On all the test papers, instructions were provided both in English and in Turkish to ensure comprehension. Administered as the pre-test, meaning recall test is presented in Appendix D, form recall test is in Appendix E and meaning recognition test can be found in Appendix F. For post-tests, meaning recall test, form recall test and meaning recognition tests are presented in Appendix G, Appendix H and Appendix I respectively.

3.6.2 Think-aloud protocol

For the second research question, considering the revealing and instantaneous nature of thinking aloud, the current study utilized think-aloud protocols in order to track participants' behavior and thought processes on task. Think-aloud protocol was a useful tool to better understand which information participants are focusing on when searching the corpus or examining paper-based corpus data, and learn what kind of problems they encounter while examining data on corpus interfaces or paper. It also had an important role in discovering what helped them find the meaning of new words inductively and the role of the search interface (Pérez-Paredes et al., 2011; Pérez-Paredes et al., 2012). Therefore, it was the most appropriate tool to inform material development and course design based on the DDL approach to L2 vocabulary learning.

Think-aloud protocol was performed one week after the interventional sessions ended with the participants from D-DDL and I-DDL groups. The reason why it was after the interventions were that the participants needed to get used to how to deal with DDL tasks and needed to establish their own strategies. This way, think-aloud protocol would give an accurate picture about students' behaviors on task. One day before the think-aloud protocols, all the participants were firstly trained about what "thinking aloud" means and how to think aloud during a task. The teacher/researcher modeled them on a sample think-aloud task. Later, participants practiced it with their pairs with some tasks on their coursebooks. After the training, participants were contacted individually and they were invited to a one-to-one meeting with the researcher. During these meetings, participants were given the same D-DDL task or I-DDL task as they had during the interventional sessions. The only difference was that they had four unknown vocabulary items on the worksheet instead of five because of time issues. Appendix J presents the think-aloud protocol task for the D-DDL group while Appendix K involves the task for the I-DDL group.

During the one-to-one meetings, participants were asked to complete the given task as they normally do but this time by thinking aloud. They were also asked to move the mouse towards where they look at on the page. That is why both of the groups had their worksheets on a computer because their actions on their computer screen were video-recorded and at the same time their thinking aloud was recorded with their permission. As for the D-DDL group, their worksheets along with COCA and MICASE were open on their computer and as for the I-DDL group, their worksheets were open on their computer. As participants completed their tasks, the researcher did not guide them except for prompting them to think aloud when participants were silent. They were allowed to speak in Turkish during these meetings and all the participants did so because they felt more comfortable in their native

language. After they felt that they came up with the meanings of all four words, they were provided with the correct meanings. Goodfellow and Laurillard (1994) argued that it is impossible to access students' cognitive processes during the think-aloud protocol. That is why participants were asked the reasons for some of their behavior, thoughts and preferences at the end of the session. These were in the form of a short interview or conversation with the students. Each session lasted around 30 minutes.

3.6.3 Focus group interviews

For the third and fourth research questions, semi-structured focus group interviews were used with all participants to collect data regarding their shared understandings and individual opinions about D-DDL and I-DDL practices. The reason why focus group interviews were preferred instead of one-to-one interviews is that it yields a better understanding of students' opinions when they interact and argue with each other within the groups. Participants may answer the questions they raise yet are not asked by the researcher, which leads to more discoveries. Participants also discover their arguments and express them better during social interaction with peers, which is related to Vygotsky's (1978) social constructivism theory.

There were four or five participants in each group during the focus group interviews in the current study. To put it more specifically, there were four interview groups of four participants and one interview group of five participants in the D-DDL group. As for the I-DDL group, there were two interview groups of 4 participants and two interview groups of five participants. Creswell (2015) argued that if interviewees are cooperative with each other, interviews will lead to better results. Thus, participants formed their groups and they chose from among their classmates whom they feel close to. During the interviews, they were allowed to speak in Turkish so that they felt more comfortable talking about their opinions. The researcher asked the

interview questions and participants argued with each other agreeing, disagreeing and elaborating. The researcher prompted silent students to express their opinions. The sessions were audio-recorded with participants' permission. Appendix L involves the interview questions for the D-DDL group whereas Appendix M presents the interview questions for the I-DDL group. Table 5 summarizes the data collection tools of the current research and explains their purpose of use.

Table 5. A Summary of Data Collection Tools and Their Purpose of Use

Tools	Purpose of Use
Pre-test	to identify 20 unknown words as the target vocabulary of the study
Post-test	to measure the vocabulary learning achievements of the participants and to compare the effectiveness of D-DDL and I-DDL on vocabulary learning
Think-aloud protocol	to gather data about participants' behavior and thought processing on task and the differences in student behaviors or thoughts between D-DDL and I-DDL tasks
Focus Group Interviews	to discover student opinions about D-DDL and I-DDL tasks and compare their perceived effects

3.7 Procedure

The current quasi-experimental study aimed to compare the effects of D-DDL and I-DDL practices on constructing new vocabulary knowledge inductively from context. During the first week of the study, 59 students studying in the English preparatory program at a private university signed consent forms that were approved by The Ethics Committee for Master and Ph.D. Theses in Social Sciences and Humanities in Boğaziçi University to participate in the study. Later, seven of these participants dropped out because they missed either of the interventional sessions during the later weeks. The remaining 52 participants were randomly assigned to two groups which were also randomly determined as D-DDL and I-DDL experimental groups. The

number of participants in the D-DDL group was 28 and in the I-DDL group, there were 24 participants. Appendix N includes the participant information and consent forms signed by all the participants.

During the second week of the study, participants in both groups had training sessions on using corpus and corpus-based concordances to learn the meanings of words. The necessity of training on using corpora has been highlighted by many researchers (Gavioli, 2001; Kennedy &Miceli, 2001; Braun, 2005; Breyer, 2006; Vannestål and Lindquist, 2007; Nation, 2008; Boulton, 2009; Frankenberg-Garcia, 2012; Karras, 2016). Moreover, as mentioned earlier in Chapter 2, researchers have been suggesting that this training should improve students' skills to interpret corpus data and learn language patterns inductively in addition to the ability to use online corpus interfaces (Sun, 2003; Gilquin & Granger, 2010, Smart, 2014). In the light of these studies, the present study planned its training program based on Smart's (2014) suggestions for training participants in a DDL context and Sternberg et al.'s (1983) strategies to help students guess from context which is explained in Chapter 2.

Participants in the D-DDL group had three training sessions while the I-DDL group had two sessions of training. D-DDL group needed more training since they needed to use online corpora which they had never used before whereas the I-DDL group had paper-based concordances. During the first session of the training, the researcher gave a presentation to all the participants on what corpus is, why it is important, what concordance is and how to use a concordance to guess the meanings of words based on Sternberg et al.'s (1983) strategies. D-DDL group was also introduced to COCA and MICASE and they were presented with a guideline with pictures on how to use these corpora to find information about words. The training was in English and Turkish at the same time to ensure comprehension. This session ended with a question-answer session and lasted around 40 minutes. The handouts of

the presentation were given to the students for further use. In the second session of the training, participants were given homework. I-DDL group was given 20 sentences taken from corpora with presumably unknown words in them and they were asked to guess the meanings of unknown words using the strategies. D-DDL group were asked to register on COCA and search for the words they learned that week on COCA and MICASE. MICASE did not require any registration. This was to help them get familiar with the corpora. Later, they had a classroom discussion on their experiences and findings with explicit feedback and teacher modeling. The third training session took place one week later, during the third week of the study. It was only for the participants in the D-DDL group. They were taken to the computer lab at the university and the researcher helped them to register on COCA if they had problems with registration. They were given a sample DDL task that had the same exercises as the instructional materials they were given during the intervention. They were asked to find the meanings of five words from the concordances. They completed the task as part of the training. When they had problems and questions regarding the use of corpora, the researcher helped them solve the problem or showed them ways to solve the problem.

When the students had problems guessing the meaning from context, the researcher showed them contextual and linguistic clues to find the meaning of the word. After the students were done coming up with word meanings, they worked in pairs to discuss their findings and their experiences. Lastly, the researcher provided them with the correct meanings of the words. The 60-minute session ended with a question-answer session. Table 6 summarizes the training procedure of the current study for both D-DDL and I-DDL groups.

Table 6. Training Procedure for D-DDL and I-DDL

Training	I-DDL	D-DDL
First Session	Presentation on what corpus is, why it is useful (authenticity, aspects of words), what concordance is, and strategies of guessing from context. Providing handouts of the presentation.	Presentation on what corpus is, why it is useful (authenticity, aspects of words), what concordance is, and strategies of guessing from context. Introduction of COCA and MICASE. Presenting the guidelines with pictures on how to use COCA and MICASE. Providing handouts of the presentation.
Second Session	Homework on guessing meanings from context. Feedback through classroom discussion, explicit explanations, and teacher modeling.	Homework on searching words on COCA and MICASE. Feedback through classroom discussion, explicit explanations, and teacher modeling.
Third Session	No training	Completion of a sample task in the computer lab using COCA and MICASE.

During the third week of the training, in addition to the third session of the training, participants had pre-tests. Having detected the unknown words, post-tests and instructional materials for the interventional sessions were developed to include target vocabulary items.

The intervention part of the study lasted four weeks. D-DDL group had their interventional sessions on Mondays at 4 p.m. in the computer lab while the I-DDL group had theirs on Tuesdays at the same hour in the classroom. Participants in both groups worked in pairs to complete their tasks during the first two interventions. Pairs in both of the sessions were formed randomly and participants did not have the same pairs in the two sessions. The third and fourth interventional sessions included individual work only. The researcher was also the teacher during the interventional sessions. She acted as a facilitator while the participants had an active role in their learning. She helped

participants when they had technical and technological problems with COCA and MICASE. She reminded participants of the strategies to come up with the meanings of words when they had difficulty. They were not allowed to use their dictionaries during the intervention because it was an inductive learning task. Moreover, students were not allowed to use the translation function or the word definitions presented on a page in COCA. Participants were encouraged to use the handouts from training sessions. After participants felt that they found the meanings of the words from the concordances, their inferences were confirmed by the teacher. As Godwin-Jones (2001) suggested, their inaccurate inferences were minimized this way. Each interventional session lasted around 60 minutes for the D-DDL group and around 30 minutes for the I-DDL group.

When the interventional sessions ended in the seventh week of the study, participants were contacted to arrange an available time for think-aloud protocols. One week later, they completed post-tests. D-DDL and I-DDL groups had their post-tests on the same day and at the same hour to ensure that they do not tell each other about the tests. All the 52 participants took the test. During the same week, 18 participants from the I-DDL group and 21 participants from the D-DDL group participated in think-aloud protocol sessions. During the ninth week of the study, focus group interviews were completed with 18 participants from I-DDL and 21 participants from D-DDL. This was the last stage of the data collection procedure.

3.8 Data analysis

Before the data collection and analysis procedure, the approval of The Ethics Committee for Master and Ph.D. Theses in Social Sciences and Humanities at Boğaziçi University was taken. Appendix O includes this approval form.

3.8.1 Pretest-posttest data analysis

3.8.1.1 Scoring pre-test and post-test

Scoring of pre-test and post-test was done based on an answer key created by the researcher. The answer key was checked by another teacher who is a graduate of an MA program in Foreign Language Education and works in the same university in order to ensure inter-rater reliability. Pre-tests were the first tests to be scored. The pretests included the same type of questions as post-tests involving meaning recall, form recall, and meaning recognition tests. The pre-tests aimed to choose 20 target words that are completely unknown to all the participants. Thus, even if one participant remembered or recognized a word, that word was not chosen as a target word. Meaning recall and form recall tests were in the form of translation tests where participants were asked to translate Turkish words into English and English words into Turkish. In meaning recall pre-tests, words were marked as unknown when participants left the answers blank or wrote wrong meanings. The same criteria were applied to form-recall pre-tests, as well. In form recall pre-tests, slight differences such as the use of plurals and infinitives were ignored unless they make a change in the meanings of the words. Moreover, spelling mistakes of up to three letters were ignored and the word was marked as known. For instance, if the answer was *convert* for the meaning *dönüştürmek* and if the participant wrote *covert* missing the letter "n", the word was marked as “known” by the participant. The reason is that, the answers with spelling mistakes give clues that participants remember the word but only don't know their form properly. In the meaning recognition pre-tests, the participants had a multiple-choice test with three options for each item. If they chose the wrong meaning of the word that is asked, the word was marked as unknown. No participant chose two answers to one question at the same time in this test.

Post-tests were different from pre-tests in that post-tests tested the effect of the interventions on participants' learning of the twenty target words that were detected as unknown with pre-tests. Scoring post-tests was done based on the answer key checked by another teacher to ensure interrater reliability. Every correct answer was one point, every incorrect answer was zero point, and no partial scoring was administered. Therefore, the maximum point for each of the meaning recall, form recall, and meaning recognition tests was twenty points, which made sixty points in total for post-tests. In meaning recall post-tests, participants translated target words from English to Turkish. If participants wrote two meanings for one word at the same time and if they did not write any answer, the answers were considered incorrect and they got zero points. There were words with more than one meaning in the target words, but no participant wrote an answer that was not discussed and confirmed during the interventions. All participants wrote the answers that were included in the answer key. Therefore, words with more than one meaning did not create any problems regarding the scoring of meaning recall tests.

In form recall pre-tests, participants were asked to translate the target words in Turkish into English. In the scoring of this test, only the target words were accepted as correct. Slight differences such as the use of plurals and infinitives were ignored unless they cause a change in the meanings of the words. Unlike in form recall pre-tests, spelling mistakes were not ignored as form knowledge was important in this test. Hence, if participants made spelling mistakes even with one letter, they were given zero points. If participants wrote two answers for one word, the answer was marked as incorrect. For meaning recognition post-tests in multiple-choice format with three options, participants were given one point for their correct answers and zero point if they chose a wrong answer. No participant chose two answers in this test.

3.8.1.2 Pre-test and post-test data analysis

Having completed the scoring, Statistical Package for the Social Sciences (SPSS) was used to explore data and calculate descriptive statistics. As the first step of the analysis of data on SPSS, a normality check was administered in order to explore whether data were normally distributed. Normality was checked by looking at skewness and kurtosis values and visual means such as histograms and Q-Q plots. Tabachnick and Fidell (2013) suggested that if skewness and kurtosis values are between +1.5 and -1.5, data is accepted as normal. Based on this suggestion, data for the current study was found to be normal. Therefore, parametric tests such as independent samples t-tests and paired sample t-tests could be run to explore inferential statistics.

In the current study, there were two independent variables, which are the experimental groups “D-DDL” and “I-DDL”, and one dependent variable (time) in two levels which are pre-test and post-test. That is why, in order to answer the first research question in this study, paired samples t-test was used to analyze within-group statistics for both D-DDL and I-DDL groups and independent samples t-test was used to compare these groups. Moreover, another analysis was run to compare the effects of type of work (dependent variable), which are pair work and individual work, on remembering and recognizing words during both D-DDL and I-DDL (independent variables). For this purpose, paired samples t-test was used to compare pair work and individual work within groups, and independent samples t-test was used to compare the effects of pair work and individual work between the experimental groups. This analysis was important to answer the third research question.

The t-values and significance values obtained from the independent samples t-test and paired samples t-test indicated whether the effect of the interventions is statistically significant or not or whether there is a statistically significant difference

between D-DDL and I-DDL on vocabulary learning. The higher the t-score, the higher the significant difference is. Moreover, the significance level, also known as alpha or α, is the probability of rejecting the null hypothesis when it is true. If the significance value is less than .05, the difference is proved to be statistically significant (Field, 2009). Confidence Intervals (CI) associated with these obtained effects was examined at a 95% level interval since according to Field (2013), "for a certain percentage of samples (be that 95% or 99%) the true value of the population parameter will fall within these limits" (p. 104). In other words, CI was important in this study to check for a true difference between sample means of experimental groups.

3.8.2 Think-aloud protocol data analysis

In order to answer the third research question, data from think-aloud protocols were collected from 18 participants from the I-DDL group and 21 participants from the D-DDL group. Data from nine participants from each of the groups were chosen for analysis. While choosing these participants, purposeful sampling was used based on the total results of post-tests. Firstly, a three-level post-test scale was determined as low (between 16 and 24 points), mid (between 25 and 32 points), and high (between 33 and 40 points). The scale was between 16 and 40 points because no student achieved lower than 16 and higher than 40. Three participants from each low, mid and high group were chosen and their think-aloud protocol data were analyzed. Video recordings and audio recordings from think-aloud protocol data and responses to post-think-aloud interviews immediately after the think-aloud protocol sessions were transcribed and coded deductively based on pre-determined coding categories. One of the coding categories was word knowledge aspects. Nation's (2001) word knowledge framework was used in order to explore which aspects of word knowledge participants

paid attention to during D-DDL and I-DDL tasks. The other established coding categories were their choice of sentences to explore word meanings, word attack strategies they used, the time spent inferencing a word meaning, number of attempts, number of obtaining correct and incorrect meaning inferences, reasons for obtaining correct and incorrect meaning inferences along with a mapping of participants' task completion process. Based on these categories, participants' verbal reports and the movement of their mouse indicators during the task were used. Both within-group analysis of the groups comparing higher scorers and lower scorers in post-test total results and between-group analysis was carried out focusing on these coding categories.

3.8.3 Focus group interview data analysis

In order to answer the third and fourth research questions, data from focused group interviews were collected and analyzed qualitatively. Focus group interviews were transcribed and thematic coding was used to explore student opinions. Data was coded deductively in that pre-determined categories such as perceived positive and negative effects of the interventions on vocabulary learning as well as perceived difference between pair work and individual work during interventions. Inductive coding was also used along with deductive learning. Some themes such as corpora-related problems and student suggestions were emerging themes during the interview data analysis.

CHAPTER 4

RESULTS

4.1 Introduction

The current quasi-experimental mixed-methods study obtained quantitative and qualitative data from the participants based on the analyses explained in the previous chapter. This chapter will present and report the obtained descriptive and inferential statistics from pre-tests post-tests within and across experimental groups, qualitative results from think-aloud protocol sessions, and from focus group interviews in order to compare the effects of D-DDL and I-DDL. Firstly, it provides SPSS results of pre-tests and post-tests on vocabulary learning based on descriptive statistics obtained from independent samples t-tests and paired sample t-tests. Then, the chapter presents verbal reports and actions of participants during D-DDL and I-DDL tasks based on data of think-aloud protocol sessions. Lastly, participant answers to the focus group interview questions are presented in the chapter.

4.2 Pre-test and post-test results

4.2.1 Post-test total results

Pre-tests and post-tests in the current study consisted of meaning recall tests, form recall tests and meaning recognition tests. The same tests were applied both as pre-test and post-test. The only difference was that pre-tests had 50 vocabulary items tested and post-tests involved 20 of these 50 vocabulary items tested. While pre-test was utilized to determine the target words which were completely unknown to all participants, the purpose of the post-tests was to measure the comparative effects of

I-DDL and D-DDL on recall of the meaning of the target words and recognition of these words by the participants. First, total post-test scores from the three different tests were analyzed in order to measure the overall effects of the interventions in I-DDL and D-DDL conditions.

In order to measure the effects of the D-DDL (N = 28) and I-DDL (N = 24) interventions within groups, a paired samples t-test in SPSS was applied to the post-test total scores separately for each experimental group. The pre-test aimed to determine words that were unknown to all participants and therefore, words are selected accordingly. As a result, the pre-test scores of all the participants were .00 for the target words, meaning that none of the students remembered or recognized the target words at the beginning of the intervention. Hence the mean of pre-tests was .00. The total post-test scores were calculated out of 60 points. The difference between pretest and posttest was defined as time factor and it was the dependent variable in all t-tests. The paired samples t-test was run separately for the two groups. The increased mean scores in post-tests showed that both D-DDL (M = 27.10, SD = 6.10) and I-DDL (M = 27.62, SD = 6.95) groups improved from pre-test to post-test. Moreover, the difference between pre-test total and post-test total was significant within both D-DDL and I-DDL groups, with values $t(27) = 23.514$, $p < .001$ for D-DDL group and $t(23) = 19.467$, $p < .001$ for I-DDL group. This shows that interventions were effective in participants' learning of unknown vocabulary items in both groups. Table 7 illustrates descriptive statistics of the within-group analysis and shows that groups improved from pre-test to post-test in total regardless of the test type and intervention type.

Table 7. Descriptive Statistics for Post-test Total Scores

	Pre-test		Post-test	
	Mean	SD	Mean	SD
D-DDL	.00	.00	27.10	6.10
I-DDL	.00	.00	27.62	6.95

Table 7 also shows that mean scores are very close to each other in both D-DDL and I-DDL groups. That is why a comparative t-test was important to see if there is a significant difference between the effects of D-DDL and I-DDL conditions. Hence, an independent samples t-test in SPSS was applied to the total post-test scores of the two groups. In this case, total post-test scores were the dependent variable whereas the experimental groups were independent variables. Obtained inferential statistics showed that D-DDL and I-DDL groups did not significantly differ from each other in terms of their post-test total scores, $t(50) = .217$, $p = .829$, 95% CI = [-4.02, 3.24]. In other words, there was no significant difference between D-DDL and I-DDL interventions in their effects on participants' vocabulary learning.

4.2.2 Meaning recall tests

Meaning recall tests in the current study were used for both pre-test and post-test to analyze the effect of both the D-DDL and I-DDL interventions on participants' recall of the meaning of the target words. During these tests, participants were asked to translate the target words into their native language, which is Turkish for all the participants. Firstly, in order to observe within-group improvements in meaning recall of target words, a paired samples t-test in SPSS was used for both D-DDL ($N = 28$) and I-DDL ($N = 24$) groups separately. The mean for the pre-test of meaning recall test was .00 for all the participants in both groups since the aim of the pre-test was to choose unknown target words for all the participants. Table 8 shows the means and standard deviation of meaning recall tests in pre-test and post-test within groups.

Table 8. Descriptive Statistics for Meaning Recall Test

	Pre-test		Post-test	
	Mean	SD	Mean	SD
D-DDL	.00	.00	5.71	2.40
I-DDL	.00	.00	7.08	2.58

Table 8 shows that both D-DDL and I-DDL groups improved in the meaning recall of target words. Moreover, the difference between the meaning recall test as a pre-test and the meaning recall test as a post-test was significant within both D-DDL and I-DDL groups, with values $t(23) = 13.418$, $p < .001$ for the D-DDL group and $t(27) = 12.591$, $p < .001$ for I-DDL group.

Although the mean of meaning recall post-test was slightly higher for the I-DDL group than the D-DDL group, there was a need for an independent samples t-test in SPSS to check whether this difference is statistically significant or not. Results of independent samples t-test denoted that there was no significant difference between groups in terms of meaning recall post-test scores, $t(50) = -1.967$, $p = .55$, 95% $CI = [-2.76, .31]$. In other words, the effects of D-DDL and I-DDL on meaning recall of target vocabulary were not significantly different based on inferential statistics.

4.2.3 Form recall tests

In form recall tests, participants were asked to translate target words from Turkish to English. Therefore, it can be argued that this test measured the deepest level of knowledge in the current study. A paired samples t-test in SPSS was utilized to measure the target vocabulary gains within groups. The increased mean scores in form recall post-tests show that both D-DDL and I-DDL group improved their target vocabulary knowledge at the form-recall level. This difference between form recall

pre-test and post-test was also statistically significant, with values $t(27) = 12.644$, $p < .001$for D-DDL group and $t(23) = 12.364$, $p < .001$ for I-DDL group. Table 9 illustrates the descriptive statistics of form recall pre-test and post-test for the D-DDL ($N = 28$) and I-DDL ($N = 24$) groups. The means of the form recall test as pre-test are .00 because the target words were unknown to the participants before the interventions.

Table 9. Descriptive Statistics for Form Recall Test

	Pre-test		Post-test	
	Mean	SD	Mean	SD
D-DDL	.00	.00	5.60	2.34
I-DDL	.00	.00	6.01	2.37

In order to compare the groups, independent samples t-test in SPSS was applied. This test was important to check if there is a significant difference between the effects of D-DDL and I-DDL on participants' vocabulary gain in form recall level. Results showed that the groups' performance did not significantly differ from each other in terms of form recall of target vocabulary, $t(50) = -.598$, $p = .55$, 95% CI = [-1.71, .92]. In other words, the difference between the effects of D-DDL and I-DDL interventions on form recall of target vocabulary did not reach a significant level.

4.2.4 Meaning recognition tests

A meaning recognition test was the only recognition test in the current study which required participants to choose the correct meaning in Turkish of the given target word from the three options. In order to measure the main effect of the interventions within the groups, paired samples t-test was administered on meaning recognition test scores. Results revealed that there was a statistically significant effect of the D-DDL and I-DDL interventions on the recognition of the target vocabulary meanings

regardless of group factor, with values $t(27) = 34.237$, $p < .001$ for the D-DDL group and $t(23) = 28.088$, $p < .001$ for I-DDL group. Table 10 demonstrates descriptive statistics of both D-DDL ($N = 28$) and I-DDL ($N = 24$) groups and shows that the groups improved from pretest to posttest in the meaning recognition test. Pre-test scores were .00 because no words that were found to be known in the pre-test were included as target vocabulary in the current study. All target vocabulary items were unknown before the interventions.

Table 10. Descriptive Statistics for Meaning Recognition Test

	Pre-test		Post-test	
	Mean	SD	Mean	SD
D-DDL	.00	.00	15.78	2.43
I-DDL	.00	.00	14.54	2.53

An independent samples t-test in SPSS was used in order to compare the groups in terms of their target vocabulary knowledge in the level of meaning recognition. Obtained SPSS results yielded no statistically significant difference between the groups in terms of meaning recognition test scores, $t(47) = 1.756$, $p = .85$, 95% CI = [-.16, 2.58]. That is, the effects of the D-DDL and I-DDL interventions on meaning recognition of target vocabulary were not significantly different.

4.2.5 Recall versus recognition tests

Participants' scores in recognition (multiple-choice) and recall tests (translation) were compared in order to check at which knowledge level of target words (recognition or recall) participants performed better after the interventions. All these tests in the current study were used both as pre-test and post-tests. Pre-test mean scores for all the participants were .00 because all the target words were unknown before the interventions for all the participants. When the means of post-tests were compared,

results showed that both D-DDL (*N* = 28) and I-DDL (*N* = 24) groups got higher scores in the recognition test than in recall tests. Table 11 illustrates a summary of mean scores in all tests in the current study. It reveals that meaning recognition resulted in higher scores than meaning recall and form recall tests for both of the groups.

Table 11. Summary of Means in All Tests

	Pretest			Posttest		
	Meaning recall	Form recall	Meaning recognition	Meaning recall	Form recall	Meaning recognition
D-DDL	.00	.00	.00	5.71	5.60	15.78
I-DDL	.00	.00	.00	7.08	6.01	14.54

When visual means such as histograms of the mean scores for all tests were checked, Both groups performed better in the meaning recognition test in comparison with form recall and meaning recall tests. Figure 1 below shows that even though groups' performances improved significantly from pretest to posttest for recall tests, the increase in meaning recognition test scores was more pronounced.

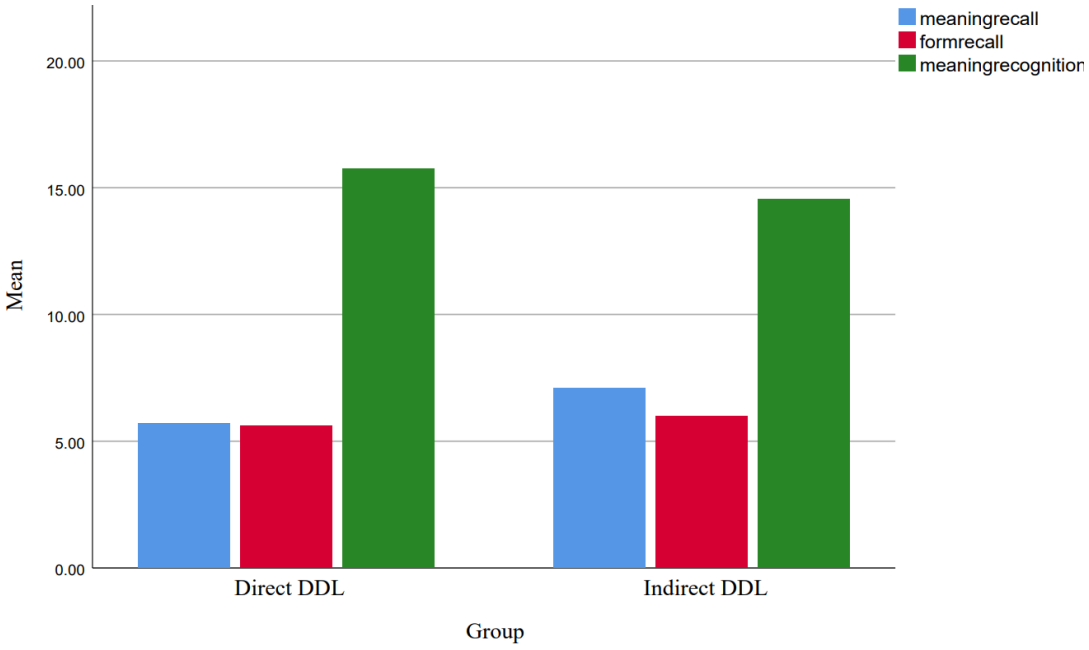

Figure 1. Comparison of meaning recognition and recall tests across groups

Paired samples t-test was utilized to see whether there was a significant difference between recall tests and meaning recognition test within each group. For D-DDL groups, results confirmed that the difference between participants' performance in meaning recall test (M = 5.71, SD = 2.40) and meaning recognition test (M = 15.78, SD = 2.43) was statistically significant and participants performed higher in meaning recongnition test, $t(27) = 28.284$, $p < .001$, 95% CI = [-10.80, 9.34]. Likewise, there was a significant difference between form recall test (M = 5.60, SD = 2.34) and meaning recognition test (M = 15.78, SD = 2.43) for D-DDL group and they performed better in meaning recognition test, $t(27) = 24.536$, $p < .001$, 95% CI = [-11.02, -9.32]. When paired samples t-test was applied on scores of the I-DDL group, results were the same as the ones of D-DDL group. I-DDL group performed significantly higher in meaning recognition test (M = 14.54, SD = 2.53) than in meaning recall test (M = 7.08, SD = 2.58), $t(23) = 21.256$, $p < .001$, 95% CI = [-8.18, -6.63]. Moreover, participants' performance in form recall (M = 6.01, SD = 2.37) and meaning recognition test (M = 14.54, SD = 2.53) differed from each other significantly and they performed higher in meaning recognition test, $t(23) = 30.269$, $p < .001$, 95% CI = [-9.12, -7.95]. All in all, meaning recognition test led to higher scores for both groups.

4.2.6 Pair work vs individual work based on recall and recognition tests

The current study aimed to statistically compare the effects of pair work and individual work on recognition and recall of target vocabulary within experimental groups. For this purpose, paired samples t-test was utilized for each test. During the interventional sessions, participants in both groups worked in pairs to learn words during the first two weeks of the interventions, and in the last two weeks, they studied

the words individually. Therefore, 10 of the target words were studied during pair work, and 10 of them were studied individually. According to the results of paired samples t-test in SPSS for each group, Table 14 summarizes the descriptive statistics of all tests with mean scores out of 10 for the words learned during pair work and individual work. Table 12 shows that pair work led to higher performance in recall and recognition tests in both D-DDL (N = 28) and I-DDL (N = 24) groups.

Table 12. Summary of Means in All Tests Regarding Words Studied during Pair Work and Individual Work

	Pair work			Individual work		
	Meaning recall	Form recall	Meaning recognition	Meaning recall	Form recall	Meaning recognition
D-DDL	3.14	3.00	8.28	2.57	2.60	7.50
I-DDL	4.08	3.41	8.04	3.00	2.58	6.50

The difference between the effects of pair work and individual work on post-test scores is also obvious when visual means were checked. Figure 2 shows the difference between post-test total scores of groups based on the words they studied during pair work and individual work.

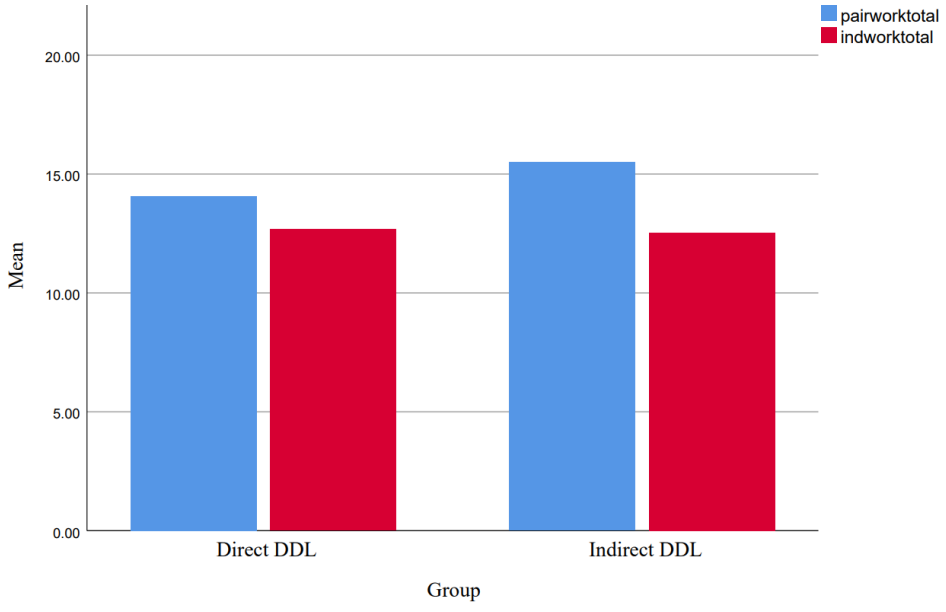

Figure 2. Comparison of the means of tests based on pair work and individual work across groups

According to the results of the paired samples t-test for D-DDL group, the effects of pair work and individual work on recall of target vocabulary did not significantly differ, with values $t(27) = 1.406$, $p = .171$, 95% $CI = [-.16, 1.40]$ for meaning recall test and $t(27) = 1.174$, $p = .251$, 95% $CI = [-.29, 1.07]$ for form recall test. However, the difference between pair work and individual work was significant in meaning recognition level of word knowledge, $t(27) = 2.253$, $p = .040$, 95% $CI = [.03, 1.53]$. When the total scores gained from pair work and individual work in all tests were analyzed, the difference between pair work and individual work was not significant, $t(27) = 1.143$, $p = .263$, 95% $CI = [-.82, 2.89]$.

When the scores of the I-DDL group were analyzed using paired samples t-test in SPSS, the differential effects of pair work and individual work were found significant in all tests, unlike the D-DDL group. Pair work and individual work had significantly different effects on participants' recall of target vocabulary knowledge, with values $t(23) = 3.760$, $p = .001$, 95% $CI = [.48, 1.67]$ for meaning recall test and, $t(23) = 2.119$, $p = .045$, 95% $CI = [.01, 1.64]$ for form recall test. Moreover, there was a significant difference between pair work and individual work meaning recognition test scores, $t(23) = 3.660$, $p = .001$, 95% $CI = [.67, 2.41]$. All in all, when the total scores gained from pair work and individual work in all tests were analyzed, there was a statistically significant difference between pair work and individual, $t(23) = 5.820$, $p < .001$, 95% $CI = [2.17, 4.57]$.

Table 13 demonstrates the summary of the results of the paired samples t-test applied to the post-test scores of each group with *t* value and *p* value. It shows that groups reacted to pair work and individual work differently based on the inferential statistics of the post-test scores of the participants.

Table 13. Summary of the t-test Results of All Tests In Terms of Pair Work and Individual Work

	Pair Work	Individual Work	t	Sig.
D-DDL	Meaning Recall	Meaning Recall	1.406	.171*
	Form Recall	Form Recall	1.174	.251*
	M. Recognition	M. Recognition	2.153	.040*
	Total Score	Total Score	1.143	.263*
I-DDL	Meaning Recall	Meaning Recall	3.760	.001*
	Form Recall	Form Recall	2.119	.045*
	M. Recognition	M. Recognition	3.660	.001*
	Total Score	Total Score	5.820	.000*

Note: Mean difference is significant at .05 level.

4.3 Think-aloud protocol results

In order to answer the second research question, participants' verbal reports, behaviors on screen and responses to the post-think-aloud interview immediately after the think-aloud protocol sessions were purposefully transcribed and analyzed based on pre-selected coding categories. Data were obtained from nine participants from each group which made 18 participants in total. During think-aloud protocols, participants and the researcher used Turkish because it was their native language, but their verbal reports were translated into English to be presented in this thesis using the codes given to each participant such as DH02 or IL01. In these codes, "D" and "I" represent their groups as D-DDL and I-DDL. "H", "L" and "M" represent their level of achievement in post-tests, namely higher scorer, lower scorer, and mid scorer respectively. The translated sentences were checked and confirmed by another English teacher who is a native speaker of Turkish. This section will compare D-DDL with I-DDL based on think-aloud protocol results. The analysis was based on their choice of sentences to explore word meanings, word attack strategies they used, the time spent inferencing a word meaning,

number of attempts, number of obtaining correct and incorrect meaning inferences, reasons for obtaining correct and incorrect meaning inferences along with a mapping of participants' task completion process. Appendix P includes a sample transcription of a think-aloud protocol session.

4.3.1 Use of word knowledge

Think-aloud protocol analysis revealed that during which participants tried to guess the meaning of unknown words, they paid attention to some other aspects of word knowledge according to Nation's (2001) word knowledge framework.

Participants in the D-DDL group paid attention to words' registers, frequency, collocations, and spoken forms. four out of nine participants paid attention to the frequency of the target words. two of these participants in D-DDL reported during post-think-aloud interviews that when they had time after they found the words' meanings, they investigated these aspects more using another function of COCA that summarizes collocations, definitions and registers of the words. Four of them also reported that they investigated words' spoken forms (pronunciations) after they found the meaning of the word clicking on the button on COCA which directs students to *YouGlish*. *YouGlish* is a pedagogical website to study pronunciations of the words in authentic contexts using *YouTube* videos. Verbal reports of the participants revealed that they were highly attentive to frequency and register aspects of word knowledge:

> (Moving his mouse to the frequency information of the word) Oh! This word is a very frequent one! (DH02, Think-Aloud Protocol, February 2022)

> This word was used 2394 times, and it is a very low frequency. (DH11, Think-Aloud Protocol, February 2022)

> I do not check MICASE because mostly these words are less frequent in spoken language. Therefore, I cannot find enough information on MICASE corpus. (DL03, Post-Think-Aloud Interview, February 2022)

> This word is often used with social topics such as women's rights, homosexualism, and human rights. (DL18, Think-Aloud Protocol, February 2022)

> When I have time, I check the page in COCA where I can see which contexts the words are used more frequently. (DM24, Post-Think- Aloud Interview, February 2022)

> Because COCA is an academic corpus, we can see which academic contexts can we use these words more frequently. I can check, for example, if the word is frequent in my departmental area. (DH02, Post- Think-Aloud Interview, February 2022)

Participants in the I-DDL group paid attention to multiple aspects of word knowledge that were mostly words' collocations. Eight participants paid attention to collocations. Only one out of nine participants during think-aloud protocol sessions asked the spoken forms of the three of the target words on their worksheet. I-DDL participants had no opportunity to check the frequency information of the target words as it was not included in their papers.

To summarize, both D-DDL and I-DDL groups paid attention to collocations and spoken forms of the target words. Although both the groups paid attention to collocations, more participants in the D-DDL group paid greater attention to collocations and spoken forms information and studied them further. D-DDL group had the opportunity to study word pronunciations in authentic contexts. Moreover, D-DDL participants showed great awareness about frequency and register.

4.3.2 Word attack strategies

During think-aloud protocol sessions, the word attack strategies participants used were also analyzed in order to compare lower and higher scorers in post-test within groups and to analyze comparisons between groups. Word attack strategies are

strategies participants used in order to guess word meanings. They were analyzed differently from word knowledge aspects because participants paid attention to word knowledge aspects not to use them to guess word meanings but to further explore the target words totally driven by their curiosity. As participants tried to guess the meanings of the target words, their word attack strategies were noted down and Table 14 summarizes these word attack strategies commonly used by D-DDL and I-DDL participants and higher and lower scorers in post-test within these groups.

Table 14. Comparing Word Attack Strategies Within and Between Groups

Group	Lower scorers	Higher scorers
D-DDL	Reread sentences	Reread sentences
	Use associations	Use associations
	Use collocations	Use collocations
	Connect to a known word	Use grammar
	Look for chunks in the word	Sound out the word
	Translate	Use pictures
		Keep reading
I-DDL	Reread sentences	Reread sentences
	Use associations	Use associations
	Use collocations	Use collocations
	Connect to a known word	Connect to a known word
	Look for chunks in the word	Use grammar
	Translate	Sound out the word
		Keep reading

The first aim was to compare D-DDL and I-DDL groups in terms of their word attack strategies. As it is obvious in Table 16, participants in both the groups reread sentences, and made use of associations and collocations in order to infer the meanings of the target words. To put it more specifically, eight out of nine D-DDL participants and all I-DDL participants made use of collocations, and seven D-DDL and seven I-DDL participants made use of associations in order to infer word meanings. The following expressions of the participants show how they made use of associations and collocations to infer word meanings:

> (trying to guess the word “ignorance”) I see the word “knowledge” many times in these sentences. And there is “foolish” here. “ignorance” can be about knowing something. (DH11, Think-Aloud Protocol, February 2022)

> (trying to guess the word “ignorance”) “ignorance” and “racism” are used together in sentences. It may have a negative meaning like “racism”. And here there is the word “unfamiliar”. Maybe it means “not to know something”. (DM22, Think-Aloud Protocol, February 2022)

> (trying to guess the word “compilation”) It is used with “of music”, “of games” and “of books”. It may mean the collection of these things. (IM23, Think-Aloud Protocol, February 2022)

As for differences between the groups, all higher scorers, namely three participants, in the D-DDL group used pictures to guess word meanings when they could not find word meanings from concordances. When higher and lower scorers in the post-test were compared in terms of their use of word attack strategies, D-DDL and I-DDL groups showed similarity whereas higher and lower scorers differed from each other. Lower scorers in both D-DDL and I-DDL groups tended to connect the unknown target words to a known word or look for chunks in the words. In addition to lower scorers, higher scorers in the I-DDL group also tried connecting target words to a known word. However, higher scorers in the D-DDL group did not use this strategy. While seven participants from the I-DDL group used these strategies, only two participants from the D-DDL group used them. The following expressions illustrate how they used this strategy to guess the target words:

> (trying to guess the word “anticipate”) This word starts with the prefix “anti”. It can mean “something opposite”. (IL16, Think-Aloud Protocol, February 2022)

> (trying to guess the word “anticipate”) “anticipate” looks like “participate”. Are they similar? Let me see. (IH20, Think-Aloud Protocol, February 2022)

> (trying to guess the word “compilation”) The word “compilation” sounds very similar to the word “complete”. So, it may be something related to that word. (DL03, Think-Aloud Protocol, February 2022)

> (trying to guess the word “compilation”) “compilation” sounds so similar to the word “competition”. So, it may be about racing. (IL01, Think-Aloud Protocol, February 2022)

> (trying to guess the word “ignorance”) this word may derive from “to ignore” which means “fail to consider”. Let me check the sentences if I am right. (DL21, Think-Aloud Protocol, February 2022)

Lower scorers in both of the groups attempted to translate the whole sentence including the target word to find word meanings. While three participants in I-DDL used translation in order to find word meanings, one participant in D-DDL used this strategy. All higher scorers in both of the groups, on the other hand, preferred to keep reading and read past the unfamiliar words. Moreover, unlike lower scorers, all higher scorers in both of the groups sounded out the target words. two higher scorers in D-DDL and three higher scorers in I-DDL used grammatical cues such as conjunctions, comparisons and contrasts, modal verbs, and adverbs. The following expressions show how they used grammatical cues to infer word meanings:

> It is written “ignorance is stronger than knowledge”. It is compared with knowledge. So, it can be the opposite of “knowledge”. (DH17, Think-Aloud Protocol, February 2022)

> It is written “ignorance but not stupidity”. I understand that “ignorance” and “stupidity” are similar to each other because of “but not”. (IH15, Think-Aloud Protocol, February 2022)

> In this sentence “I can anticipate…”, it can mean something related to “possibility” because I also see “probably” here. (DM08, Think-Aloud Protocol, February 2022)

> Here it is written "I can't deny I love this woman.". There is a use of "can't" and in another sentence, they used "impossible to deny". So, it is obvious that it means "to refuse something". (IH20, Think-Aloud Protocol, February 2022)

Each participant in both D-DDL and I-DDL groups used combinations of strategies on task. However, all higher scores as determined by the post-test used a combination of more strategies for each word compared to lower scorers.

4.3.3 Strategies used for choosing concordance lines

All participants needed to start with choosing a concordance that will best help them to guess the words' meanings correctly and fastly because both groups had at least 10 concordances presented to them. While the I-DDL group had 10 concordances for each target word pre-selected for them by the teachers, the D-DDL group had more than 100 sentences after they searched the target words on COCA. Participants' verbal reports and responses in post-think-aloud interviews showed that they had a variety of strategies for determining a concordance to read and guess the meanings of the target words.

All participants in the I-DDL group chose concordance lines first when they included the words they were familiar with. They scanned the concordances and they avoided reading the concordances with too many unknown words. Furthermore, all participants tended to choose the shortest concordances among the ones presented to them. They thought that when the concordances are shorter, they can reflect the meaning of the target words better. The following expressions show the reason for students' preference for shorter concordances:

> When the sentences are short, it means that the sentence tells a lot with a few words. This means that the meaning is intense, so it is easier to find the meaning of the target words. (IM04, Post-Think-Aloud Interview, February 2022)

> When the sentences are short and precise, the meaning of the target word is clearer. (IL16, Post-Think-Aloud Interview, February 2022)

Participants in the D-DDL group reported more strategies than the I-DDL group in order to choose the best concordances presented by COCA to guess the target words' meanings. All D-DDL participants tried to choose concordances that mostly include the words that are familiar and known to them. Moreover, six out of nine participants chose concordances that appealed to their interests and world knowledge and that included the topics familiar to them. They chose to study the target words in the wider context. seven out of nine participants used the wider context function in COCA so that they could read one or two sentences before and after the sentence that includes the target word. Furthermore, five of the participants tried to choose wider contexts where the target words were repeated at least twice or three times in different sentences in the same context as they found it easier to guess the words' meanings. One of the participants reported that she chose concordances where the target word was used as a subject in order to easily guess its meaning. One of the participants, on the other hand, reported that she chose concordances where the target words were not used as the subject or main verb because she had difficulty guessing the meaning of the target word in these sentences. Following verbal reports of the participants are some of their strategies:

> I chose the sentence about “Assasin Creed” because I know the game and I thought I can guess the meaning of the word easily. (DH11, Post- Think-Aloud Interview, February 2022)

> The sentence about Barack Obama grabbed my attention. I know some information about him, so I can guess the word easily. (DM22, Think- Aloud Protocol, February 2022)

> Let me read this sentence. It is about women's rights. (DL21, Think-Aloud Protocol, February 2022)

> I choose sentences where the target word is used in the subject position because I think that the sentence will describe the target word or will be mainly about the target word. So, it is easier to guess the meaning. (DH17, Post-Think-Aloud Interview, February 2022)

> If the target word is repeated more than once in the "view more context" part, it is easier to guess the meaning because I see two different uses of the word in the same context and on the same topic. It is easier to connect sentences this way. (DH17, Post-Think-Aloud Interview, February 2022)

> When I click on “view more context”, I can read the sentences before and after the sentence that includes the target word. This is helpful to understand the meaning. (DM22, Think-Aloud Protocol, February 2022)

> I will check the websites with the ending “.blog” or “.com” because the language in these websites is simpler than the one in the websites ending with “.org”, I believe. (DH02, Think-Aloud Protocol, February 2022)

In summary, while participants in the I-DDL group tended to choose shorter sentences, participants in the D-DDL group tended to view a wider context. Moreover, participants in the D-DDL group reported more strategies they used in order to choose the best concordances that help guess word meanings easily.

4.3.4 Difficulties experienced specific to each intervention

Participants in each group had different challenges and ways to deal with these challenges. Participants in the D-DDL group, for instance, had difficulties in finding and choosing the representative concordance lines or concordance lines that were appropriate for their language level to guess the meanings of the target words. To illustrate, all of them reported that they had difficulty in finding concordances in COCA that included words that they knew. Six out of nine participants often chose concordances that included many discipline-specific terminologies. When they chose these concordance lines in COCA, they reported that they could not understand the concordances and they immediately wanted to check another concordance line. Following concordances are some of these sentences they

chose to examine in COCA that are not representative of the target words underlined or include terminology, proper names that were not familiar for the participants, or words far beyond the level of the participants:

> "Many progressives want to deny that bigotry and vengefulness are baked into Islamic texts and traditions."
>
> "You ought to anticipate paying a lot more to your rates."
>
> "Has there been a compilation of fat-friendly gyms anywhere on the internet?"
>
> "Those days are gone. Today the best offense and defense are the same: anticipate change."
>
> "As part of it, separate compilation at the source-code level shall be tossed aside in favor of a Live Object Layer."
>
> "The best compilation to get is the Eyeball of Hell on Scat."

Participants in the D-DDL group reported during post-think-aloud interviews that if they could not understand the sentences and could not infer the meanings of the words, three of the participants said that they checked the page in COCA where they could see the collection of the words' collocations. On this page, they reported that they looked at only the collocations to check the meanings of the target words instead of full sentences. Moreover, three of the participants told that they sometimes used the function of COCA where they could check the visual representatives of the target words. When they did not understand the sentences, they chose to click on a link in COCA where the users were directed to *Google Images* that present some images representing the searched words. The following sentences from the post-think-aloud interview illustrate the difficulty participants had in finding representative sentences or appropriate sentences for their purpose or language level and how they deal with this difficulty:

> I try to choose sentences that include the words I know, but it is sometimes difficult to find those sentences. (DL03, Post-Think-Aloud lnterview, February 2022)

> Some words in COCA are really difficult and beyond our level. Some sentences include terminology about the economy, for instance. (DH11, Post-Think-Aloud lnterview, February 2022)

> I sometimes cannot find sentences that I can understand easily and I check the page in COCA where collocations of words are presented to guess word meanings. (DM24, Post-Think-Aloud lnterview, February 2022)

> If I had difficulty understanding sentences, I check images of the words in COCA. It is easier to guess the meanings that way. And because I am a visual learner, I can remember the words more easily later on. (DH17, Post-Think-Aloud lnterview, February 2022)

Only two of the students used MICASE after he used COCA to search the target words during the think-aloud protocol sessions. When they were asked the reason why they did not choose to study words in MICASE, six of the participants in the D-DDL group reported that they found MICASE corpus difficult and confusing because of the KWIC view. Three of them also told that they found the spoken language difficult to understand.

Three different teachers chose the sentences presented to the participants in the I-DDL group. These teachers agreed that the sentences were representative of the target words and easy to guess the meaning of the target words. Six participants reported that the number of sentences presented to them for each word is too many and it is confusing. They suggested that if they are given less than 10 sentences for each word, it may be easier to guess word meanings. They said that five sentences may be sufficient to guess word meanings easily. On the other hand, five of these six participants also reported that having 10 sentences for each word has advantages. They reported that they could see the different uses of the target

words in different sentences, which gave them an idea of how to use the sentences later in writing or speaking. Moreover, five participants in the I-DDL group reported that they had difficulty inferring word meanings from sentences with different topics. They suggested during post-think-aloud interviews that it could be easier to guess word meanings when the sentences presented to them were on the same topic.

Although participants in the D-DDL group did not report any suggestions about topic-focused sentences unlike the I-DDL group, their verbal reports on task during the think-aloud protocol show that they are also confused with sentences from a variety of topics presented in COCA. Following sentences from the D-DDL group show their confusion due to sentences with a variety of topics including one target word:

> This sentence is about family issues and the previous sentence was about customer relations. It is so confusing. (DH17, Think-Aloud Protocol, February 2022)

> Now, this sentence is on another topic. How to find the common meaning? I am confused. (DM08, Think-Aloud Protocol, February 2022)

4.3.5 Making incorrect guesses

Participants in both the groups guessed the meanings of some words incorrectly. While nine participants in the D-DDL group had 19 incorrect guesses out of 36 words, nine participants in the I-DDL group guessed 13 words out of 36 words incorrectly. Lower scorers in the post-test had a higher number of incorrect guesses during think-aloud protocol sessions. The reason behind these incorrect guesses was analyzed based on participants' behavior on task during think-aloud protocol sessions.

Both of the groups had the same reasons behind why they guessed the word meanings incorrectly. Firstly, they had wrong inferring when they read only a few sentences, such as two or three sentences before they made the last decision about the meanings of the target words. Moreover, they had wrong guesses when they had different hypotheses from every sentence they read and did not try to test their hypothesis with the other sentences. They read every sentence independently from each other and guessed different meanings in every sentence. Later, they did not check whether the meaning they found fit the other sentences.

Another reason why they guessed the meanings of the words incorrectly was that they had the wrong interpretation of the word parts or word forms and did not test their hypothesis. The following verbal reports illustrate how they misinterpreted the word forms and guessed words incorrectly:

> The word "anticipate" starts with "anti". I am sure it is something about being opposed to something. (reads 2 sentences silently) Yes, I think it can mean being opposite or disagreeing with somebody or something. (DL21, Think-Aloud Protocol, February 2022)

> "anticipate" sounds like "antipathy". And this sentence has the word "hate". So, I think it means "to have an antipathy". (IL01, Think-Aloud Protocol, February 2022)

> "compilation" looks so similar to "complete". So, it can mean the noun form of "to complete". (reads 1 or 2 sentences silently) In these sentences, it is used as a noun. So, I guess that it means "completion". (DL18, Think-Aloud Protocol, February 2022)

4.3.6 Task completion process

Participants' task completion process was analyzed while they were on task during the think-aloud protocol sessions. In the D-DDL group, two participants who were higher scorers in the post-test followed these steps in order to guess the meanings of a target word:

1- Write the words on the search box in COCA

2- Click on the search button

3- Click on the word

4- Scroll down and skim the concordance lines

5- Choose a line

6- Click on “view more context” and read three sentences including the target word

7- Repeat 4th, 5th, and 6th steps for another three to five concordances

8- Have a hypothesis about the meaning of the target word

9- Test the hypothesis with two to three more concordances

10- If the hypothesis works, write the guess on the worksheet. If the hypothesis does not work, check two to six more concordances to form and test the hypothesis.

One D-DDL participant who was a higher scorer and three mid scorers in the post-test followed different steps to guess word meanings as follows:

1- Write the words on the search box in COCA

2- Click on the search button

3- Click on the word

4- Scroll down and skim the concordance lines

5- Look at the collocations and associations in a lot of concordances

6- Have a hypothesis

7- Scan concordances, click on view more context, and test the hypothesis with another three or four concordance lines

8- If the hypothesis works, write the guess on the worksheet. If the hypothesis does not work, check two to six more concordances to form and test the hypothesis.

Two participants who were lower scorers in the post-test did not confirm their hypothesis with other concordance lines and read each concordance line independent from the other. They had difficulty finding the common meaning in all the concordances. They read fewer concordances to guess meanings compared to higher and mid scorers. One participant out of three lower scorers started reading concordances from the first one and continued with the next concordances in order. Moreover, even if the concordances they read were very difficult for them to understand, they did not skip to another concordance and tried hard to understand and translate those concordances. In other words, they used less number of strategies to choose concordances to examine.

Eight participants in the I-DDL group had a very similar process in their task completion process. The only difference may be that they read the relatively fewer sentences before they had a hypothesis and guessed the meanings of the target words. In the I-DDL group, two lower scorers along with all mid and higher scorers in the post-test followed these steps in order to guess the meanings of a target word:

1- Choose and read one to three concordance lines

2- Have a hypothesis

3- Test the hypothesis with another two to three concordances.

4- If the hypothesis works, write the guess on the worksheet. If the hypothesis does not work, check tree or four more concordances and/or reread the same concordances to form and test the hypothesis.

One participant in the I-DDL group who was a lower scorer in the post-test did not test his hypothesis using other concordances. After he read two to four concordances, he had a hypothesis and he did not check other concordances to test his hypothesis.

4.3.7 Time spent for meaning inferences

In order to guess the meanings of four different target words during think-aloud protocol sessions, the task completion process lasted 25 minutes on average for the D-DDL group while I-DDL participants spent 10 minutes on average. One reason why the D-DDL group needed more time to complete the think-aloud protocol task was they had more steps to complete in order to access the concordances. They needed to write and search the words on COCA, and click on the word again in order to access the concordances. Another reason was that they spent more time finding concordances they could understand easily to guess word meanings as they had hundreds of concordances presented to them. The other reason was that participants needed to wait and refresh their pages sometimes due to some technical problems in COCA.

4.4 Focus group interview results

Focus group interviews were carried out with 21 participants from the D-DDL group and 18 participants from the I-DDL group. The audio recordings from the focus group interviews were transcribed and analyzed. Results were categorized under four different subtitles positive attitudes, negative attitudes, perceived effects of pair work and individual work, and student suggestions. Some responses of the participants were translated from Turkish into English in order to be presented in this section in order to avoid interpretation errors. Another English teacher who is a native speaker of Turkish checked and confirmed these translations.

4.4.1 Positive attitudes

4.4.1.1 D-DDL group

D-DDL participants reported that they find DDL tasks effective in learning words and remembering them later on. All participants reported that it was more effective than traditional deductive vocabulary tasks because they were more cognitively engaged in the task trying to find the meaning of the word, which enabled them to recall the words they studied more easily. Another aspect of D-DDL tasks that helped them remember target vocabulary items was that, as four of the participants reported, they sometimes used visual representatives of the words and *YouGlish* in COCA where they could examine the words in context with YouTube videos, which they believed helped them remember words better as they were visual and auditory learners. Moreover, four participants in one interview group expressed that when they guessed the meanings of the words correctly rather than incorrectly, they could remember them more easily. The following expressions of the participants illustrate their attitudes towards D-DDL tasks and vocabulary recall:

> Since I spend a lot of time trying to understand the word's meaning, I remember the words later on much more easily than checking dictionaries. I realized that when I use dictionaries to learn words, I generally forget them immediately. Normally it takes too much time to learn words. (D06, Focus Group Interview, February 2022)

> Corpus is more useful than checking dictionaries because I spend a lot of time learning a word. This helps me to remember the words much more easily. However, I don't think I will use this at home to study words because I need to turn on my computer, get into COCA and search the word, and so on. It takes too much time. (D20, Focus Group Interview, February 2022)

> I think corpus is really useful because I love learning words from TV series and videos. That is why corpus tasks are fun for me. (D19, Focus Group Interview, February 2022)

> I have a good visual memory. That is why when I check the pictures of the words in COCA to guess the words, I remember them easily. (D05, Focus Group Interview, February 2022)

Eighteen out of 21 D-DDL participants reported that they also benefited from the fact that there were many concordances where they could observe different uses of the target words in different sentences with a variety of grammatical structures and contexts. They believed this would help them to be able to use the target words during writing and speaking. Moreover, 15 out of 21 participants found the frequency information about the words beneficial for the appropriate use of the target words in different registers. The following expressions of the D-DDL participants show their attitudes toward the positive effects of D-DDL tasks on the productive knowledge of target vocabulary:

> Because we could see the target words in a lot of different sentences, we could see the different uses of the words such as repeated collocations, prepositional collocations, and topics they are used with. This helps us to be able to use the words correctly in our writing. I feel more confident when I try to use these words. (D07, Focus Group Interview, February 2022)

> The frequency information was very beneficial because we could see whether the word was frequent in academic texts or not since COCA was an academic corpus. I can understand if the word is formal or informal if I can use it in essays. (D06, Focus Group Interview, February 2022)

> I will study economics next year, for example, and I check which words are more common in topics related to economics and how the words are used in these sentences. It is very beneficial to be able to use the words correctly in a sentence. (D17, Focus Group Interview, February 2022)

All D-DDL participants believed that while they were trying to guess the meaning of the target words, they were also learning some other words incidentally. Eight of the participants added that they also improved their grammar during D-DDL tasks. The following expressions of the participants show their positive attitudes toward the effect of D-DDL tasks on incidental learning of words and grammar:

> When we try to learn words, we can also see other academic words that we don't know. This way, we learn a lot more academic words apart from the target words. Moreover, all the articles in COCA were authentic academic articles. This prepares us for academic life. (D04, Focus Group Interview, February 2022)

> When I was searching for the target words, I realized that I learned some other academic words I encountered in those sentences, because I could remember them when I saw some of them later during reading. (D21, Focus Group Interview, February 2022)

> Corpus tasks give us the opportunity to be exposed to a variety of academic words and different sentence structures. I think I also improved my grammar this way. Moreover, this is an academic corpus and it is very beneficial to see what kind of grammar people use in academic texts. However, I sometimes think "Do we need to read all these academic texts when we are still prep students?". (D13, Focus Group Interview, February 2022)

When they were asked if D-DDL tasks affected their vocabulary learning motivation, most of the participants replied that it did not change their motivation at all. Only four of the 21 participants replied that it was motivating for them. The following expressions express these four participants' attitudes towards the effect of D-DDL tasks on motivation:

> I was motivated because I felt successful when I could guess the meanings of the words without checking a dictionary. I told myself "See? You can do it!". (D12, Focus Group Interview, February 2022)
> I was motivated because I could guess word meanings even from those difficult sentences in COCA. (D13, Focus Group Interview, February 2022)

> Corpus activities were fun because we did something very different from our routine activities. We changed places and went to the computer lab. That is why I enjoyed the corpus activities. (D21, Focus Group Interview, February 2022)

> Trying to find word meanings was like a puzzle game. I had fun. When we had pair work, it was even more fun. (D09, Focus Group Interview, February 2022)

4.4.1.2 I-DDL group

All I-DDL participants believed that I-DDL tasks were more beneficial than deductive vocabulary activities. They believed that because they were more cognitively engaged in I-DDL tasks by thinking about the meaning of the target words, they could remember the words more easily than using dictionaries. 14 out of 18 participants also expressed a positive attitude towards the effect of I-DDL tasks on productive knowledge of the target words since they could observe them in ten different sentence structures. The following expressions show that they believed the effect of I-DDL tasks on vocabulary recall and productive knowledge of vocabulary:

> I believe these tasks help us learn the words better because we read ten different sentences to understand the meaning of the target word. That is why we remember them later on more easily than checking dictionaries. (I23, Focus Group Interview, February 2022)

> We struggle more to understand the meaning of the target words during these tasks. We think more about the words and their use. We pay attention to how the words are used in sentences. This also helps us to be able to use these words in writing or speaking later. We spend more time in the process instead of focusing on the result. Therefore, we remember these words more easily. (I18, Focus Group Interview, February 2022)

> Instead of looking at the example sentences where the target words were used after we look up their meanings in dictionaries, it is better to see example sentences before we know the meanings. It is better for remembering them and more fun. (I06, Focus Group Interview, February 2022)

Eight out of 18 I-DDL participants reported that they acquired other words they encountered while they were trying to guess the meanings of the target words. The following expressions show their positive attitudes toward the effect of I-DDL tasks on incidental learning:

> I saw a word during the tasks. When I saw that word later in another text, I could remember that word and I could understand its meaning. I thought that these tasks are not only effective for the target words, but also for the other words in those sentences as we think about those sentences for a lot of time. (I05, Focus Group Interview, February 2022)

> We learn extra words apart from the target words. (I14, Focus Group Interview, February 2022)

Twelve out of 18 participants believed that I-DDL tasks helped them improve their reading and listening skills by improving their guessing from context skills. The following expressions prove their positive attitudes toward the effect of I-DDL tasks on improving receptive language skills such as reading and listening:

> I believe it improves my reading skills because I got used to guessing word meanings from context instead of checking my dictionary immediately. (I12, Focus Group Interview, February 2022)

> I did not like these tasks in the first two weeks. I got frustrated all the time because I could not guess the meanings and I had a strong desire to check them in a dictionary. I did not want to use my brain because it tired me. However, after the second week, I got used to guessing word meanings and I felt that it was very beneficial. Now I feel that I can guess word meanings while watching TV series in English. In the past, I used to look up the words in the dictionary immediately. (I04, Focus Group Interview, February 2022)

When the participants were asked whether I-DDL tasks had an effect on their motivation, 16 of the 18 participants expressed positive feelings. They were motivated more by the I-DDL tasks which they found a fun way of learning vocabulary. They also reported that I-DDL tasks helped them develop the feelings of success. Five of these participants said that they felt frustrated when they could not find the meaning of the word and this harmed their self-esteem about language learning. Two of the participants reported that their motivation did not change as they found the tasks unnecessarily challenging. Following expressions of these participants show their attitudes clearly:

> It is a very fun activity. It is different from other usual activities. (I16, Focus Group Interview, February 2022)
>
> It is a very original activity and never boring. (I12, Focus Group Interview, February 2022)
>
> It is very motivating to learn the meanings of the words on our own by guessing the meanings. I trust myself more in language classes. When I have a wrong answer, however, I feel useless. (I05, Focus Group Interview, February 2022)
>
> My motivation does not increase. Yes, I like it when I find the word meaning on my own, but there are easier ways to learn words. (I01, Focus Group Interview, February 2022)

4.4.2 Negative attitudes

4.4.2.1 D-DDL group

All the participants in the D-DDL group believed that D-DDL tasks were time-consuming. Although they believed that spending a lot of time learning a word helps them remember the word better later on, the time-consuming nature of D-DDL tasks avoid them to believe that it is an effective way to learn vocabulary. The following responses of the participants illustrate their negative attitudes toward the time-consuming D-DDL tasks:

> I believe it is useful to learn vocabulary but it is difficult for me to use COCA because it takes too much time. And as a student who has a lot of responsibilities, I do not think it is the most effective way. I can sometimes check the frequency of the words in academic texts and that is it. (D09, Focus Group Interview, February 2022)
>
> It is much more difficult than checking dictionaries because it takes too much time. I would not check corpus unless I need to examine the use of a word in detail. (D10, Focus Group Interview, February 2022)
>
> COCA has hundreds of sentences and it is so confusing. We need to choose which sentences we will read. We need to understand difficult sentences. Therefore, it takes too much time. Still, I have to accept that it is really useful to remember words later. (D07, Focus Group Interview, February 2022)

Eleven out of 21 participants in the D-DDL group reported that using COCA to guess word meanings was very tiring and confusing for them as they needed to deal with difficult sentences that they found far beyond their level and inappropriate for prep school students. They reported that learning words from COCA is more appropriate for academic studies or departmental students who are more familiar with academic articles. Thirteen of the participants said that the higher-level language affected their motivation negatively as they became less self-confident. The following responses illustrate participants' negative attitudes toward the difficult language they dealt with during D-DDL tasks:

> COCA is very difficult for students who try to learn a language because there are a lot of words that I do not know in COCA. It makes me tired of trying to understand those sentences full of difficult academic words. (D08, Focus Group Interview, February 2022)

> Since there are a lot of sentences, I get confused. I am usually not sure which sentences to choose to study target words. Also, there can be multiple meanings of a word. In that case, it can be more confusing for us to find the meanings in too many sentences in COCA. (D21, Focus Group Interview, February 2022)

> I find this task very scary because all the sentences are academic sentences full of advanced words. It looks like a serious job not for students. (D17, Focus Group Interview, February 2022)

> Of course, it is good that we are exposed to academic grammar and vocabulary, but I sometimes think whether it is necessary to cope with such difficult texts as a language learner in prep school. (D20, Focus Group Interview, February 2022)

> These tasks affected my motivation very negatively because when I tried to read those articles with a lot of vocabulary I do not know, I was scared. I felt like I did not know any English vocabulary. (D11, Focus Group Interview, February 2022)

Another factor that caused participants to have difficulty with D-DDL tasks with COCA was the variety of sentences with a variety of topics such as economics, society, human rights, medicine, and politics. Four out of 21 participants reported that they had difficulty guessing word meanings

when they read concordances from a variety of topics. The following common participant response illustrate the difficulty participants had due to a variety of topics in COCA:

> It is good to see different uses of a word in different topics, but it is also confusing. I cannot associate the word meanings with each other when I read sentences from different areas. It makes it more difficult to guess word meanings. (D08, Focus Group Interview, February 2022)

All participants expressed their negative attitudes towards corpora-related technical problems. These were mostly about registration in COCA, wait time in COCA, KWIC view and spoken language symbols in MICASE, and unfriendly interface in both of the corpora. Most of the students had trouble registering for COCA during the training period as COCA did not have an easy-to-follow registration process. Moreover, when there are successive word searches in COCA, it gives a wait time for the searcher of about a minute and the searcher should refresh the page in the browser not to wait for a minute. Participants got frustrated when they had this wait time. During D-DDL tasks, all participants used COCA and five of them used MICASE as the second corpus. When they were asked the reason, they replied that they found the transcriptions of spoken language and KWIC view in MICASE confusing. Only three of the participants reported that the KWIC view was better to observe frequent collocations of the target words. The following responses illustrate participants' negative attitudes towards corpora-related problems:

> The registration was complicated. I had difficulty registering in COCA. (D02, Focus Group Interview, February 2022)

> COCA requires you to wait for some time before you search for another word. I refresh pages but still, it is annoying. (D11, Focus Group Interview, February 2022)

> MICASE was complicated because the words were placed in the middle of the page. Also, there are only a few sentences about some of the words in MICASE because it is a spoken corpus I think. So, I did not use MICASE. (D12, Focus Group Interview, February 2022)

> In MICASE, sentences had complicated signs and complicated language. It is just useful to find the collocations easily. (D03, Focus Group Interview, February 2022)

When participants were asked whether they plan to use *COCA* at home to study vocabulary, six of them replied that they plan to use it for their future academic studies but not in prep year. The following expressions show their plans with COCA:

> I will use it in the future during my studies in my department. I can look for the use of the words in sentences in texts related to my department. (D27, Focus Group Interview, February 2022)

> Because my department is Translation and Interpretation Studies, I think I will use it a lot in the future. (D17, Focus Group Interview, February 2022)

> I plan to use it to see how the words are used in a sentence. Because it takes a lot of time, I am not sure I will use it now during prep school. We do not have a lot of time and we have an exam to pass. (D09, Focus Group Interview, February 2022)

4.4.2.2 I-DDL group

Although I-DDL participants believed that there were no negative effects or disadvantages of I-DDL tasks, five out of 18 participants could not help suggesting less tiring and more fun vocabulary activities or classroom games such as matching vocabulary exercises before playing *Taboo* or *Hot Seat* with target vocabulary items. Four of the participants said that when they were tired, they were not eager to complete I-DDL tasks as they required them to think deeply to guess word meanings. Moreover, five of the participants expressed that they did not like the feeling of being unsure of the meaning of the target words before they confirmed the meanings with the teacher. Moreover, 13 of the 18 participants found it

confusing to have a lot of sentences with a variety of topics such as medicine, politics, and art instead of having sentences around only one topic. Some of the participants' responses to the question "What are the negative effects/disadvantages of these corpus tasks?" are as follows:

> I believe there is no disadvantage to these tasks. What could it be? (I04, Focus Group Interview, February 2022)

> I like these tasks when I am not tired but still, I believe we can learn these target words more easily with other vocabulary exercises. (I03, Focus Group Interview, February 2022)

> I do not like the feeling of being unsure about the meanings of the target words. I immediately want to check my guesses using a dictionary. (I16, Focus Group Interview, February 2022)

> When the topics of the sentences vary in every sentence, it is difficult to guess the meanings. I cannot find the connection between the sentences. (I01, Focus Group Interview, February 2022)

4.4.3 Perceived effects of pair work versus individual work

4.4.3.1 D-DDL group

In the D-DDL group, 15 of the 21 participants preferred pair work rather than individual work during D-DDL tasks. Thanks to pair work, they could help each other to find contextual cues to guess the meanings. Moreover, they could find the most representative and helpful concordances to guess the meanings easily and quickly. They also believed that they remember the words better when they guessed them as pairs because they remember their dialogues or arguments on word meanings. They could also ask each other some unknown words in concordances. Six of the participants, on the other hand, preferred individual work because they usually learned better when they work individually. Moreover, when one of the pairs was faster in finding the word meaning, one of the pairs became a passive learner.

4.4.3.2 I-DDL group

Sixteen of the 18 I-DDL participants preferred pair work to individual work. Similar to D-DDL participants, I-DDL participants believed that they could remember the words better when they worked in pairs because they could remember their dialogues or arguments they had on word meanings. They also said that they had more fun during pair work compared to individual work. They could compare their guesses and show each other contextual cues to guess meanings correctly. Furthermore, when they were too tired to generate ideas, they could brainstorm together to guess meanings from context during pair work, which motivated them in the tasks. On the other hand, two of the participants preferred individual work because, similar to D-DDL participants, if one of the pairs was faster in finding the word meaning, one of the pairs became a passive learner and could not benefit from the task.

4.4.4 Student suggestions

4.4.4.1 D-DDL group

D-DDL participants had some suggestions about integrating corpus into language classrooms. Sixteen participants suggested that it is better to have D-DDL tasks at home as extra vocabulary exercises as it takes too much time during lessons. Furthermore, because they believed that it is not appropriate for prep students, four participants suggested that teachers can introduce corpus to prep students, but let them use it during their departmental years.

They had suggestions about corpus interfaces, as well. Eight participants suggested that there should not be a requirement for registration in *COCA*. All participants also suggested that there should not be wait time in COCA because it was discouraging. Seven participants suggested that the colors and the style of the

interface as well as the buttons in it should change because it does not have a friendly and modern look. They suggested that users should be able to sort out the academic texts in *COCA* based on their language levels so that they could find the concordances appropriate for their level of English.

4.4.4.2 I-DDL group

Nine out of 18 participants in I-DDL suggested that the number of sentences should be reduced to five sentences as it was confusing to have ten different sentences for each word. For the other eight participants, however, 10 sentences were better to guess word meanings easily. Five of the participants suggested that the sentences presented to them to guess one target word should be around the same topic. In other words, they suggested that all the sentences including one target word should be about human rights or politics.

CHAPTER 5

DISCUSSION

5.1 Introduction

The present study aimed to compare D-DDL and I-DDL in constructing vocabulary knowledge. Adopting a mixed-methods research design, data were obtained from pre-test and post-test, think-aloud protocol, and focus group interviews. Although overall results of the pre-test and post-test showed that the performance of groups on recall and recognition of the target vocabulary did not significantly differ, data from the think-aloud protocol and focus group interview uncovered some differences in students' behaviors on task and attitudes towards DDL tasks along with some similarities. In this chapter, the findings of the current study presented in the previous chapter will be discussed in relation to the relevant literature.

5.2 Recall and recognition of vocabulary

Pre-test and post-test were used to measure participants' vocabulary gains at three different levels of word knowledge that are meaning recall, form recall, and meaning recognition. Meaning recognition test involved multiple-choice questions where participants selected the meaning of each target word from three options. Recall tests, on the other hand, required participants to translate the target words into Turkish and their Turkish equivalents into English, namely the target words. Hence, while the meaning recognition test measured participants' receptive knowledge of the target words, recall tests necessitated mastery at the productive knowledge level. In the present study, all participants got significantly higher scores in the meaning recognition test compared to both form recall and meaning recall tests regardless of group factor. This finding is in line with previous studies (Teichroew, 1982; Nation,

2001; Laufer, 2005; Webb, 2005; Pellicer-Sanchez, 2017) which found that acquiring productive knowledge, namely word knowledge at recall level, is more demanding than acquiring receptive knowledge, namely word knowledge at recognition level. It can be argued that participants' higher scores in the meaning recognition test compared to recall tests are due to a lack of depth of vocabulary in recognition level. However, it can also be argued that higher scores in meaning recognition tests can be because they involved multiple-choice questions which were open to guess. Hence, participants might have chosen the correct option by chance even if they did not know the answer.

Paired-samples t-tests in SPSS were conducted to analyze target vocabulary recognition and recall within both I-DDL and D-DDL groups. The mean of pre-test scores was zero because words that were unknown to all participants were included in the test to identify target words to be used in the study. All the words they recalled or recognized were excluded from the target vocabulary list. Findings illustrated that both D-DDL and I-DDL participants received significantly higher scores in post-tests. In other words, DDL interventions were effective in both D-DDL and I-DDL conditions. Several studies compared DDL with traditional methods, and they concluded that D-DDL (Horst et al., 2005; Çelik, 2011) and I-DDL (Boulton, 2008, 2009, 2010b; Ergül, 2014; Kazaz, 2015) practices were both more effective in acquiring new words compared to traditional methods. The findings of the current study can be supported by these studies as both D-DDL and I-DDL were effective in learning new vocabulary according to a within-group analysis run in SPSS.

Although Vyatkina (2016) focused on the acquisition of collocations in the German language in her study, it was the most similar study to the current one since she compared I-DDL with D-DDL in vocabulary learning. Vyatkina's (2016) study used both immediate and delayed post-tests which showed that there was no

significant difference between D-DDL and I-DDL groups in their effects on students' collocation learning in German. The results of the current study are consistent with Vyatkina's (2016) findings. In the current study, when D-DDL and I-DDL groups were compared based on their results on all the three immediate post-tests, findings from SPSS analysis showed that groups did not significantly differ from each other in form recall, meaning recall, and meaning recognition tests. In other words, D-DDL and I-DDL participants had similar vocabulary gains at three levels of word knowledge, namely form recall, meaning recall, and meaning recognition. However, the current study did not have a delayed post-test. This is the limitation of the current study because a delayed post-test would have given a better understanding of participants' learning of the target words.

Previous research revealed that, under certain circumstances, D-DDL tasks can be cognitively too difficult to deal with (Clifton & Philips, 2006) such as including too many unknown words (Coady, 1979; Cobb, 1999; Chambers, 2007; Balunda, 2009) with concordances too difficult to interpret for the participants (Koosha and Jafarpour, 2006; Yoon and Hirvela, 2004). Therefore, researchers highlighted the importance of teacher guidance in the form of a selection of relevant and necessary concordances to prepare I-DDL tasks that are less overwhelming for students (Leech, 1997; Thompson, 2006; Reppen, 2011). That is why it has been suggested that I-DDL can be even more effective than D-DDL activities (Boulton, 2010b). However, the findings of the current study show that D-DDL tasks without this guidance can be as equally effective as I-DDL on vocabulary acquisition. This can be corroborated by the findings of O'Keeffe and McCarthy (2010) and Chambers (2005). They found that during D-DDL activities students have a chance to choose concordances they find easier from a large selection of concordances. Furthermore, in some concordancers like COCA, students can use wider context options to help them guess word meanings easily. In other

words, without teacher guidance, students can use the strategies that help them deal with the overwhelming data on corpora in order to find word meanings easily. However, participants' level of English language proficiency has an important role in these findings. The fact that participants had an intermediate level of proficiency in English contributed to the fact that they dealt with higher-level authentic concordance lines in COCA more easily. The results of the post-tests would not probably be the same for lower-level students as Boulton (2009) also argues that D-DDL favors higher-level students.

5.3 Corpus consultation and vocabulary learning behaviors

Participants' actual behaviors during DDL tasks were analyzed with think-aloud protocol sessions along with post-think-aloud interviews. Data from nine participants from each group were chosen purposefully to be analyzed so that these participants were higher, lower, and mid scorers in terms of their post-test total scores in the study. The reason was to observe the effects of the differences between the participants' behaviors on the task on their vocabulary retention and recognition. Screen and voice recordings of the participants revealed their thought processes and the movements of their mouse indicators on the screen.

One of the aims of the think-aloud protocol sessions was to test the comparative effects of D-DDL and I-DDL on participants' attention to multiple dimensions of word knowledge. Hence, their behaviors on task were analyzed based on Nation's (2001) word knowledge framework. According to this framework, as mentioned earlier, knowing a word also involves knowing its frequency, form, syntactic use, collocations, pronunciation, associations, and other aspects. A similar study to the present study was carried out by Tsai (2019) who investigated students' behaviors on the D-DDL task in comparison with the deductive vocabulary task based

on Nation's (2001) framework using the think-aloud protocol method. Tsai (2019) found that participants paid greater attention to collocations. Likewise, Aşık et al.'s (2016) study found through questionnaires and focus-group interviews that D-DDL participants believed D-DDL practices raised their awareness of collocations of the words they studied. Results of the current study supported these findings in that the D-DDL group paid great attention to the target words' collocations. This was also correct for the I-DDL group as they also paid great attention to collocations. Both of the groups were mostly attentive to prepositional collocations such as "compilation of". The reason may be that prepositional collocations can more easily attract attention because they are more frequent. Another reason may be that participants found the prepositional collocations more useful for their speaking and writing practices. Two out of nine participants in the D-DDL group also reported during post-think-aloud interviews that they further studied the collocations and register of the target words after they guessed their meanings on a page in COCA that summarizes collocations and registers of the words. The difference between the groups was that more D-DDL participants paid greater attention to the register/context of the target words compared to I-DDL participants. D-DDL group especially paid attention to the frequency of the words in a variety of academic registers whereas the I-DDL group did not have the opportunity to check the frequency information of the target words as it was not included in their worksheet. The fact that D-DDL participants were presented with two types of corpora that were MICASE (spoken) and COCA (written) may be a contributor to their further attention to frequency and register aspects of the words. Most of them were attentive to the variation in the frequency of the target words in spoken and written academic registers. Only two D-DDL participants checked MICASE after COCA and they reported that it was difficult to find a sufficient number of concordances in MICASE due to the low frequency of the words in spoken

language. The other participants who never checked MICASE reported that they did not prefer to use MICASE because of the same reason. This shows that using two different corpora raised participants' awareness about the frequency of the words in different registers. The reason may be that students could notice the differences between spoken and written language and how words were differently used in these contexts when they were exposed to spoken and written text types in two different corpora. Thus, they became more sensitive to language variation (Gulquin & Granger, 2010; Quan, 2016). Furthermore, more participants in the D-DDL group paid attention to the spoken forms (pronunciation) of the target words compared to the I-DDL group. D-DDL group reported during the post-think-aloud interview that they further investigated the spoken forms in *YouGlish* in COCA where they could watch authentic videos including the target words. This way, D-DDL participants had repeated exposure to the target words in a variety of authentic contexts, which gives a better understanding of word meanings (Schmitt, 2000; Nation, 2001; Nation, 2009; Gardner, 2013). These findings are in line with Allan (2009) who found that DDL offers the potential to improve students' vocabulary depth with knowledge of collocations, contextual behavior, and register. However, the current study showed that D-DDL gave more opportunities to students to deepen their word knowledge as they paid greater attention to frequency, register, and spoken forms of the target words, as well, and this is important for students to gain richer meaning representations (Freebody and Anderson, 1981; Nation, 2001; Laufer & Nation, 2001; Qian, 2002; Lee, 2003). Moreover, the fact that D-DDL participants further investigated target words' collocation, registration, and spoken form information after they found the meaning of the words can be linked to Aston's (2001) "curiosity-driven corpus search" concept. Participants used their opportunity to further exploit corpus data because of their curiosity during D-DDL tasks. A limited sample of data in I-

DDL tasks, on the other hand, prevented participants from performing further exploitation of corpus data (Bernardini, 2000). From this perspective, it can be argued that D-DDL gives more opportunities for incidental learning and this is one of the richest potentials of corpora for language learning (Breyer, 2011).

Students use word attack strategies to guess a word's meaning in context. The current study aimed to compare D-DDL and I-DDL groups and each group's higher and lower scorers in terms of post-test total results based on their word attack strategies. Even if all the participants in both of the groups were trained on word attack strategies defined by Sternberg et al. (1983) before the interventions, the word attack strategies they used showed differences. In other words, even if there was training on how to guess word meanings from context, students chose the strategies that were best for them and created their own strategies. Since Tsai (2019) also used a think-aloud protocol to explore D-DDL participants' word attack strategies, it is reasonable to compare his findings to the current study. Tsai (2019) found in his study that students mostly used collocations but they used associations as the final solution if they could not find the answer. However, results of the think-aloud protocol analysis of this study showed that both D-DDL and I-DDL participants mostly used collocations and associations as well as rereading sentences and connecting the target words to a known word to guess word meanings. D-DDL group differed from the I-DDL group in that they used visual representatives in COCA and their prior knowledge, as well. According to McCarthy et al. (2010), using world knowledge is one of the important strategies that students should use in order to handle new words. The fact that D-DDL participants showed the use of their world knowledge unlike the I-DDL group can be linked to the fact that since D-DDL provided students with a wide range of concordance lines, they were able to choose the ones they found appealing to their interests (O'Keeffe and McCarthy, 2010).

Tsai (2019) found that D-DDL participants used translation and words' part of speech to guess word meanings. However, in the current study, none of the participants used words' part of speech to guess word meanings and only post-test lower scorers in both D-DDL and I-DDL groups tried to predict the words using translation technique. Higher scorers, on the other hand, preferred to keep reading and read past the unknown words. It is possible that keeping reading reduced the cognitive load that was caused by unknown words in concordance lines. In contrast, the translation technique may have raised participants' cognitive load, requiring them to pay attention to every word to be able to translate the concordance lines. Moreover, it was observed during think-aloud protocol sessions that when participants tried to translate concordance lines, they dwelled on the concordance lines that they were not able to make meaning of and spent too much time. They avoided skipping to other concordance lines. This may be the reason that participants who used the translation strategy received lower scores in post-tests that measured their recall and recognition of target vocabulary. Higher and lower scorers in the groups differed more in their choice of word attack strategies in that only higher scorers in both of the groups used grammatical cues and sounded out the words and only lower scorers tried to make meaning from the familiar chunks in words such as prefixes and suffixes. Even if there were differences between higher and lower scorers in both of the groups, it was observed that D-DDL and I-DDL participants used almost the same strategies. The only difference was that the D-DDL group showed the use of prior knowledge and pictures.

I-DDL group had 10 concordances for each target word pre-selected for them by the teachers while the D-DDL group had more than 100 sentences after they searched the target words on COCA. Both of the groups used some strategies to choose concordance lines to investigate in order to guess the meanings of the

target words. These strategies can also be added to the word attack strategies in the DDL context. The common "concordance-based" word attack strategy in both D-DDL and I-DDL groups is that participants scanned concordance lines aiming to choose the ones that did not include unfamiliar words for them. D-DDL group tended to check the extended context in COCA since they believed it was easier to guess word meanings when they understood the overall meanings of the texts (Chambers, 2005). This is in line with Tsai's (2019) findings in that D-DDL participants used the extended context in COCA to guess word meanings. I-DDL group, on the other hand, chose shorter sentences to guess word meanings as they thought that shorter sentences have intense meanings and reflect the meanings of the target words better. Moreover, they were able to guess words correctly from the shorter concordances. This finding is not in line with Flowerdew's (2005) argument which stated that students have difficulty in making meaning out of the shorter concordance lines presented in I-DDL practices since they are decontextualized. This can be interpreted in two different ways. The reason for their strategy may be that they knew they were given the best concordance lines as in Chujo et al.'s (2013) study; therefore, they were trusted that even shorter concordance lines could help them guess words easily and maybe faster. Their trust was also obvious in their argument that having less than 10 concordance lines could help them complete the tasks more easily since these concordances would best reflect the meanings of the words anyway, which would be sufficient to guess the meanings of the words. Another reason may be that D-DDL participants developed contextual awareness better than the I-DDL group. This is in line with the previously mentioned findings that they paid great attention to the register and frequency aspects of the target words. Moreover, another "concordance-based" word attack strategy they used supported that they were aware of the importance of

the context in guessing word meanings. This strategy was that when they clicked on the wider context, they aimed to see repeated use of the target words in the same context in order to guess the meanings of the words easily.

It was revealed that the D-DDL group used more "concordance-based" word attack strategies during think-aloud protocol sessions. Apart from the strategies mentioned, they wanted to choose concordance lines that the topics of which appealed to their interests and world knowledge. One participant aimed to choose concordance lines where the target words were used in subject position in the sentence as the sentence could best define the target word. Moreover, another participant aimed to choose concordance lines where the target words were used in object position because she believed it was difficult to guess a word when it is in the subject or verb positions that have the main meaning in a sentence. Results revealed that D-DDL participants used more strategies in number than I-DDL participants in their word attack strategies. This can be interpreted in two different ways. One is that D-DDL gave participants more freedom in how to investigate the target words and participants used a wide variety of concordance lines as an opportunity to use their strategies to find the best concordances for them to guess word meanings easily (Bernardini, 2004; O'Keeffe & McCarthy, 2010). The other interpretation is that the D-DDL group did not have teacher guidance in the selection of concordances unlike the I-DDL group and they had more difficulty than the I-DDL group such as having too many concordance lines full of unknown words (Cobb, 1999; Chambers, 2007; Balunda, 2009; Boulton, 2011). Therefore, they needed to use many strategies to deal with these difficulties and complete their tasks (O'Sullivan, 2007).

Although D-DDL participants used a variety of strategies to choose concordance that will be the most helpful for them to guess word meanings, they had difficulty in choosing to do so. They sometimes chose concordances that were not representative (not reflecting the intended meaning), were inappropriate for their language level, or included discipline-specific words or proper names they were not familiar with. This was not the case in the I-DDL group as the concordance lines were pre-selected by their teachers. When D-DDL participants in this study chose one of these concordance lines to investigate that was too difficult for them, they skipped to another one that was easier for them. However, results of the current study revealed that post-test lower scorers avoided skipping to another concordance line and tried hard to make meaning and translate the difficult concordances. Furthermore, when they had difficulty understanding concordances, the D-DDL group checked visual representatives or scanned only the collocations of the target words in COCA to deal with difficult concordances. However, it was found that only higher scorers used these strategies. Findings further revealed that lower scorers in both D-DDL and I-DDL groups used fewer strategies compared to higher scorers. For instance, some lower scorers in D-DDL and I-DDL groups did not use any strategy in choosing concordances. That is, they started with the first concordance line and continued with the next ones in order to guess word meanings. This shows that the use of word attack strategies affects vocabulary recall and recognition in both D-DDL and I-DDL contexts. The findings are in line with previous research that students need training and should be encouraged to use word attack strategies in both the DDL practices (Nation, 2008; Gilquin & Granger; 2010; McCarthy et al., 2010). Although some of the participants used a variety of

strategies to deal with difficult concordances, some D-DDL participants did not or could not use strategies and needed teacher guidance in their concordance selection. Otherwise, their vocabulary gains from the D-DDL tasks were negatively affected.

Think-aloud protocols' results revealed that participants showed signs of being "language detectives" (p.101) defined by Johns (1997). Participants in both the groups had a hypothesis and tested their hypothesis with the other concordance lines (Chujo et al., 2009). Participants, therefore, showed what Bernardini (2004) calls "discovery learning" which showed itself as "browsing large and varied text collections in open-ended, exploratory ways" (p. 22). Results revealed that some participants in both of the groups who were lower scorers did not use hypothesis testing and they read every concordance line independent from each other. These participants had difficulty finding the common meaning in all concordances and they had mostly incorrect guessings, in the end. Moreover, some lower scorers had the wrong interpretation of word parts such as prefixes and suffixes. When they did not check their hypothesis with the other concordances, they had incorrect guessings. This shows that hypothesis testing is an important factor in participants' vocabulary recall and recognition as only lower scorers did not perform hypothesis testing (Chujo et al., 2009). Results showed that lack of hypothesis testing led to incorrect guessings and this may also have a negative impact on their vocabulary recall and recognition. This can be supported by what they reported during focus group interviews that they believed when they guessed word meanings incorrectly, even if there was teacher confirmation later on, they had difficulty in remembering word meanings.

I-DDL group completed their tasks faster than D-DDL participants during think-aloud protocol sessions. When guessing the meanings of four target words took eight to 10 minutes for I-DDL participants, it was 20 to 25 minutes for D-DDL

participants. One reason for this difference was corpora-related. For instance, D-DDL participants needed to complete more steps to access the concordance lines in COCA. They needed to write the target words on the search bar and click on some buttons to access the concordance lines. Moreover, they sometimes needed to wait or refresh their pages due to successive searches in COCA. Another reason was that they spent more time scanning the concordances and choosing the best ones to investigate. They needed to read more concordance lines than the I-DDL group to have a hypothesis and check their hypothesis since not all the concordances they chose were appropriate for their language level. This shows that I-DDL tasks required less time to be completed as the concordance lines were pre-selected for the participants and there were no corpora-related distractors, which decreased the cognitive load of the tasks for the students. This is in line with Chujo et al.'s (2013) study which revealed that students found I-DDL less time-consuming and more practical because they were given the best concordances. This supports the fact that choosing concordance lines based on readability (Kuo et al. 2001), frequency (Levy, 1990), usefulness (Tribble, 1997), and lack of corpora-related technical problems helped the participants to make meaning of the concordances faster even if there was no simplification (Boulton, 2009). While both D-DDL and I-DDL groups were exposed to "authentic" language (Römer, 2008; McEnery & Xiao, 2010), I-DDL task was less time-consuming.

5.4 Pair work versus individual work

In the light of Vygotsky's (1978) sociocultural theory that supports scaffolding by peers, the current study aimed to compare the effects of pair work and individual work on vocabulary recall and recognition. Participants in both groups studied 10 of the 20 target words in pairs and 10 of them individually during DDL tasks. Participants' post-test scores were also analyzed based on the points they gained from the vocabulary

they learned individually and in pair work. A paired samples t-test in SPSS was run to statistically compare the effects of pair work and individual work on form recall, meaning recall, and meaning recognition levels of word knowledge. Results showed that I-DDL participants gained significantly higher scores from the words they learned in pair work compared to individual work in all three tests. Likewise, the D-DDL group gained higher scores from the words they learned during pair work in all the three post-tests when the mean scores of post-tests were observed. However, this superiority of pair work was not statistically significant in form recall and meaning recall tests although it was significant for the meaning recognition test. In other words, pair work benefited the I-DDL group in three levels of word knowledge, but the D-DDL group did not benefit from pair work in the levels of form recall and meaning recall except for meaning recognition. Therefore, these results partially support previous research (Carter & McCarthy, 1995; Kirschner et al., 2006; Flowerdew, 2008) which found that working with peers benefited corpus consultation, especially for weaker students as they were "scaffolded" by high-proficient students. However, findings also showed that pair work does not always increase success in DDL as the difference between the effects of pair work and individual work was not statistically significant in the D-DDL group in form recall and meaning recall post-tests. This finding is consistent with previous studies which found that pair work may affect students' attitudes and motivation negatively when there are conflicts between pairs in terms of language proficiency and characteristics, which causes students difficulty in interpreting concordance lines (Järvelä et al., 2000; Vannestål and Lindquist, 2007; Chan & Chen, 2010). This is most probably the case in this study as it is revealed by participants' responses during focus group interviews about pair work during DDL tasks. seven out of 21 participants in the D-DDL group believed that they could not benefit from the D-DDL tasks when their pairs found the meaning of the target words

more quickly, and this caused anxiety and affected their motivation negatively. This is consistent with previous research (Järvelä et al., 2000; Chan & Chen, 2010) that suggested the fact that one of the pairs is faster than the other causes negative attitudes and negatively affects students' motivation.

5.5 Students' attitudes towards DDL in vocabulary learning

Attitudes of 21 D-DDL and 18 I-DDL participants towards DDL practices were revealed based on the data obtained from focus group interview sessions. According to the results, participants in both D-DDL and I-DDL groups believed that DDL practices were more effective on vocabulary recall rather than checking dictionaries or matching with definition exercises. These findings also supported Chambers' (2007) findings in that students had a positive attitude toward the use of inductive activities. They reported that when they were cognitively involved in DDL tasks while guessing from context word meanings, it was easier to remember the target vocabulary later on. Since they were more active in their learning, they felt that they benefited from their vocabulary tasks more than deductive approaches. This is in line with the studies of Laufer and Hulstijn (2001), McCarthy (1990), and Cobb (1999) as they argued that students are highly involved in their guessing from context tasks with deeper cognitive processes, and this leads to better vocabulary retention. Chujo et al.'s (2013) study also found that participants had positive attitudes towards being more "active" in their learning process because they believed that it was better for memorizing lexico-grammatical structures. The current study showed that this positive attitude was also present for memorizing vocabulary meanings.

Both of the groups showed positive attitudes towards having multiple concordance lines that helped them observe different uses of words in different sentences. They believed that being exposed to the use of the target words in multiple

sentences raised their awareness of the frequently used lexico-grammatical structures such as collocations and prepositional collocations with which the target words are used (Cobb, 1997; Horst et al., 2005; O'Keeffe et al., 2007; Allan, 2009; Greaves & Warren, 2010; Moon, 2010; Aşık et al., 2016). Moreover, they believed that this helped them to understand how to use these target words in speaking and writing correctly (Cobb, 1999; Liu & Jiang, 2009; Yoon & Hirvela, 2004). In other words, it can be argued that they gained confidence in their speaking (Geluso & Yamaguchi, 2014) and writing skills (Liu & Jiang, 2009; Yoon & Hirvela, 2004).

Unlike I-DDL participants, the D-DDL group also expressed an attitude towards the authenticity of the concordances they read. D-DDL participants had positive attitudes toward being able to observe the use of the target words in different authentic sentences and contexts (Chambers, 2007; Boulton, 2009). D-DDL participants also found the frequency information of the words very helpful to investigate whether the target words were frequent in authentic academic contexts or specific discipline areas such as their future departmental areas. They believed that this prepared them for academic life. This is not in line with Aşık et al.'s (2016) study which found that there was no difference in students' awareness of frequency after D-DDL tasks. However, it supports Quan's (2016) argument that using concordance lines help students improve their understanding of how words are used in different authentic contexts. This is the most significant benefit of DDL practices as Römer (2008) and McEnery and Xiao (2010) argue. This helps them to be able to use words appropriately in a variety of contexts. On the other hand, the I-DDL group did not express an attitude towards the authenticity of the concordance lines. This may be because the concordance lines were decontextualized and students may have seen them as example sentences taken from dictionaries forgetting that they were taken from authentic contexts.

Only I-DDL participants reported that they found the I-DDL tasks helpful for reading and listening skills, as well as speaking and writing. The reason was that they believed they improved their guessing from context skills with the inductive DDL tasks. They were not used to inductive vocabulary learning tasks that are not very common in traditional classrooms before they were given I-DDL exploratory tasks (Chan & Liou, 2005; Balunda, 2009). That is why, they gained confidence in their reading and listening skills as they improved their skills to deal with the unknown words in a text (Cobb, 1999). This shows that learning through DDL improves students' discovery skills and inductive learning, thus enhancing their autonomy (Bernardini, 2002; Boulton & Cobb, 2017; Boulton, 2017).

Both D-DDL and I-DDL groups believed that DDL tasks led to incidental learning. However, all the D-DDL participants believed that they experienced incidental learning of vocabulary items other than the target vocabulary, eight out of 18 participants in the I-DDL group believed so. Here, it is important to note that eight out of 21 D-DDL participants reported that they experienced incidental learning of grammar, as well. No I-DDL participant, however, reported any experience on incidental learning of grammar but only vocabulary. This may be because the language structures and vocabulary that D-DDL participants were exposed to were more complicated and higher-level language structures whereas concordance lines in I-DDL tasks were pre-selected by their teachers considering their level of language. Therefore, there were fewer grammatical structures and vocabulary in I-DDL concordance lines that the participants were not familiar with.

Four out of 21 D-DDL participants reported that they were motivated by the DDL tasks whereas 16 out of 18 participants in the I-DDL group believed that their motivation increased. One of the factors that increased their motivation was that they found DDL tasks as exploratory activities "like puzzle games", which were different

from their usual deductive activities and fun for them. This can be related to the concept of "gamification" which increases student engagement and motivation (Borrás-Gené et al., 2019) with the use of points, badges, and prizes (Pujolà & Appel, 2020). In the DDL context, students try to come up with word meanings and they feel successful and rewarded when their guesses were confirmed to be correct. Moreover, they were motivated when they moved to the computer lab and worked with computers, which again was not like their usual lessons. Another factor that increased their motivation was the feeling of success when they were able to guess word meanings correctly. This feeling of success increased students' self-confidence and self-esteem, which increased their motivation (Mair, 2002; Gilquin & Granger, 2010; Boulton, 2010a). However, five out of these 16 participants in the I-DDL group also reported that they got frustrated when they were not able to find the correct meanings (Sha, 2010).

Although most of the I-DDL participants believed that I-DDL tasks were motivating and fun, some of them believed that I-DDL tasks were too difficult to deal with when they felt tired as they were active in their learning process. Furthermore, they reported that they did not like the feeling of being unsure while trying to guess the word meanings and they wanted to check their guesses immediately. This is maybe because they were not used to inductive vocabulary activities (Chan & Liou, 2005; Balunda, 2009; Sha, 2010).

D-DDL participants reported more factors that decreased their motivation during D-DDL tasks. Firstly, all participants found D-DDL tasks very time-consuming. This is consistent with previous research which found that students complain about the time-consuming nature of D-DDL (Chan & Liou, 2005; Chambers, 2007; Balunda, 2009; Chujo, et al., 2013). They also reported that they avoid using COCA at home because it takes too much time even if they find corpus

search beneficial. Another factor that decreased their motivation to have D-DDL was that they believed that it was not appropriate for prep year students but only for departmental students or academic studies due to the high-level academic language in COCA (Cobb, 1999; Chambers, 2007; Balunda, 2009; Boulton, 2009, 2011). Therefore, when they were asked if they planned to use COCA in their language learning studies, only six of the participants said that they planned to use it but not in prep year. They thought it was more appropriate for their future academic studies in their departments. Therefore, it can be argued that the higher-level language in D-DDL discouraged students to use it even if they believed that they benefited from it. Some of the D-DDL participants also reported that the high-level language in COCA made them less self-confident in their language proficiency as they realized that there were a lot of words they needed to master. They noticed the gap between their language level and the higher-level authentic language in COCA (Boulton & Cobb, 2017). This is not consistent with previous research (Mair, 2002; Gilquin & Granger, 2010; Boulton, 2010a) that supported that D-DDL students develop self-confidence through corpus consultation and discovery. Results of the current study show that this is not always true as the fact that the language level of the concordance lines in COCA was not appropriate for the participants harmed their self-confidence. D-DDL group also found corpora-related technological problems demotivating. They found the registration process in COCA difficult and not necessary. Moreover, they believed that wait time in COCA after successive searches was frustrating and discouraging. These findings are in line with the findings of Yoon and Hirvela (2004), Vannestăl and Lindquist (2007) and Aşık et al., (2016) in that students found technological problems frustrating. Moreover, they believed that MICASE was complicated because of its spoken language, transcript symbols, and KWIC view. While most of the students found KWIC view confusing (Thurstun & Candlin, 1998; Sun, 2000; Kennedy &

Miceli, 2001; Yoon & Hirvela, 2004), 3 out of 21 D-DDL participants found it useful to be able to observe the frequent collocations easily. This is a support to Schmidt's (2001) and Chapelle's (2003) argument that the KWIC view increases the possibility of noticing the different linguistic items surrounding the target word. Still, they did not use MICASE because they believed that it had an unfriendly look. This shows that a user-friendly look of the corpora was an important factor in students' motivation to use them.

Even if they showed positive attitudes toward being able to observe different uses of words in different contexts, both D-DDL and I-DDL participants found it difficult for inferring meanings to have a variety of concordance lines with a variety of topics such as economics, society, human rights, medicine, and politics. They found it confusing and difficult to make the connection between the concordance lines in order to find the common meaning in these different concordances. This finding is not consistent with the previous research (Schmitt, 2000; Gardner, 2013) which suggested that observing how the words differed in different contexts helps students have a better understanding of word meanings and they guess it more successfully.

When participants' suggestions were asked, most of the I-DDL participants suggested that all the concordance lines presented to them should be on the same topic. For instance, all of them should be related to politics. Moreover, nine out of 18 participants suggested that there should be less than 10 sentences presented to them. They believed that five concordance lines would be sufficient to see the meanings of the words more clearly. D-DDL group had more suggestions. They suggested that DDL should be given as an extra vocabulary activity as homework because it was time-consuming at school. Since they believed that D-DDL tasks were not appropriate for prep students, they suggested that teachers should introduce COCA during prep years but they should let students use it in departmental years. They also suggested

that they should be able to sort out the texts in COCA based on their language levels and topics. They found the look of COCA very out of date and they suggested that colors and style should be more modern and friendly.

In terms of their attitudes towards pair work and individual work during DDL tasks, D-DDL and I-DDL groups showed similarities. Most of the participants in both groups believed that pair work was more effective than individual work during DDL tasks. They reported that they were able to remember the target words better during pair work because they were able to remember the dialogues or arguments they had about the meanings of the words. Both of the groups also reported that they helped each other during pair work to find and show each other the contextual cues to guess word meanings and to compare guesses. D-DDL group reported further positive effects of pair work as they were able to ask the unfamiliar words in concordance lines to each other. During pair work, they were also able to help each other to find the best concordance lines that represented the meaning of the target words more clearly. This shows that students had positive attitudes towards the fact that pairs supported each other and "scaffolding" took place (Vygotsky, 1978). This is in line with Carter and McCarthy's (1995) and Kirschner et al.'s (2006) argument that students benefit from discussing their own findings of corpus data with another pair to increase their achievement in language learning. Kirschner et al.'s (2006) also argued that pair work helps make inductive DDL practices helpful for all learning styles. Results of the current study, however, showed that pair work may not address all individual differences. Six out of 21 D-DDL participants and 2 out of 18 I-DDL participants found pair work less effective because they normally studied better individually. Moreover, during pair work, when one of the pairs was faster in finding word meanings, the other pair could not benefit from the task. This negatively affected their motivation (Järvelä et al., 2000; Chan & Chen, 2010). These findings are not

consistent with Flowerdew's (2008) findings that weaker students benefited more from group work. Similar to Vannestål and Lindquist's (2007) findings, some students may find pair work difficult in interpreting the concordances and pair work may not be an effective way to help all students through corpus consultation.

CHAPTER 6

CONCLUSION

6.1 Introduction

This chapter presents a summary of the findings of the current study in relation to the research questions. It concludes with pedagogical implications in the light of the findings and limitations of the study with suggestions for further research.

6.2 Summary of the findings

The aim of the present study was to investigate the comparative effects of D-DDL and I-DDL on learning new vocabulary. With this aim, the study adopted a mixed-methods quasi-experimental research design. The first question of the study attempted to compare the effects of D-DDL and I-DDL on recall and recognition of new vocabulary using pre-test and post-test design. The second question aimed to explore students' behaviors on task during D-DDL and I-DDL practices. In the light of data obtained from individual think-aloud protocol sessions, students' behaviors on constructing vocabulary knowledge, word attack strategies, and challenges were explored. This data also revealed the differences between the behaviors of post-test higher and lower scorers in order to explore what factors in their behaviors contributed to higher achievements in vocabulary retention and recognition. The third research question aimed to uncover the comparative effects of pair work and individual work on learning new words during D-DDL and I-DDL practices with pre-test and post-test design. It also aimed to explore the perceived effects of pair work and individual work through focus group interviews. Data from focus group interviews also provided answers to the fourth question of the study and revealed students' positive and negative attitudes toward D-DDL and I-DDL practices as well as their suggestions.

Pre-test and post-test data analyses were carried out to answer the first research question. Results from the within-group analysis showed that both D-DDL and I-DDL students improved their vocabulary knowledge significantly at form recall, meaning recall, and meaning recognition levels. This shows that both D-DDL and I-DDL were effective in learning new vocabulary at all levels. When meaning recognition and recall tests were compared within each group, it was revealed that both D-DDL and I-DDL participants had significantly higher scores in meaning recognition tests than in recall tests. In other words, both DDL practices contributed to vocabulary learning at the recognition level more than the recall level which is a deeper level of word knowledge. Between-groups analysis was used to compare D-DDL and I-DDL on their effects on vocabulary learning at these word knowledge levels. Results revealed that the groups did not significantly differ from each other in their post-test results at all levels. To put it more precisely, D-DDL and I-DDL had similar effects on students' vocabulary gains at three levels of word knowledge namely meaning recognition, meaning recall, and form recall. These results contributed to the literature by revealing that D-DDL and I-DDL can have equal effects on vocabulary learning without the teacher's guidance in I-DDL in the form of the pre-selection of concordances by the teachers based on readability, frequency, and usefulness.

The second research question aimed to explore students' behaviors on D-DDL and I-DDL tasks through the think-aloud protocol. Firstly, participants' constructing word knowledge was analyzed based on Nation's (2001) word knowledge framework. Results showed that both D-DDL and I-DDL students paid great attention to collocations, mostly prepositional collocations. That is, they showed further exploration of them even if they were not asked to. Results also showed that, in addition to collocations, the D-DDL group also paid great attention to spoken forms, register, and frequency aspects of the target words in COCA. Some students showed

"curiosity-driven corpus search" (Aston, 2001) as they used their opportunity to further exploit language data. For instance, they used a page in COCA where they could see target words' frequent collocations and register information. They also used *YouGlish* in COCA where they could hear the pronunciation of the target words in authentic videos, which also helped them to be exposed to the target words in a variety of contexts and observe the differences in their use in these contexts. These findings revealed that D-DDL may give more opportunities to students to further explore different aspects of word knowledge, which is important for students to have richer meaning representations (Freebody & Anderson, 1981; Nation, 2001; Laufer & Nation, 2001; Qian, 2002; Lee, 2003).

Participants' word attack strategies were also analyzed in order to answer the second question of the study. Word attack strategies are the strategies students use in order to guess word meanings easily. The word attack strategies students used during the think-aloud protocol can be classified into two categories in the present study: word-based and concordance-based (i. e. the strategies to choose the best concordances to guess word meanings easily). As for word-based word attack strategies, D-DDL and I-DDL groups showed similarities. Both of the groups used the following word attack strategies:

- Using collocations
- Using associations
- Rereading sentences
- Connecting the unknown words to a known word
- Translating sentences
- Looking for chunks in the words
- Keeping reading
- Using grammatical cues

The only difference between D-DDL and I-DDL groups was that D-DDL students also used pictures in addition to the word attack strategies listed above. They said that they used pictures on *the Google Images* page directed by a button in COCA when they had difficulty making meaning out of the concordance lines in COCA.

In concordance-based word attack strategies, D-DDL and I-DDL groups showed differences. The only common strategy they used to choose the concordance lines was that both of the groups aimed to choose concordance lines that did not include unfamiliar words. I-DDL students showed a tendency to choose shorter concordance lines as they believed that shorter ones had more intense meaning and could reflect the meaning of the target words better. On the other hand, D-DDL students used extended context in COCA where they could read the sentences before and after the sentence that included the target words. This is because they believed understanding the context more helped them infer word meanings more easily. In addition, D-DDL students differed from I-DDL students in that they used more concordance-based strategies, which were listed as follows:

- Choosing extended contexts where the target words were repeatedly used
- Choosing concordances lines that appealed to their interests and world knowledge
- Choosing concordance lines where the target words were used as the subjects of the sentences
- Choosing concordance lines where the target words were used as the objects of the sentences

Overall, it was observed that D-DDL participants used more word attack strategies than the I-DDL group. Moreover, they used their world knowledge in both choosing the concordances and in inferring word meanings. These findings can be interpreted in two different ways. Firstly, it can be argued that D-DDL offered

students more freedom on how to investigate the target words by presenting students with a wide variety of concordance lines. This way, they could find opportunities to use their world knowledge, as well. Secondly, it can be argued that the D-DDL group did not have the teacher guidance that the I-DDL group had in the form of pre-selection of concordances by teachers. Therefore, D-DDL students may have had more difficulty in guessing word meanings with concordance lines full of unknown words. Thus, they needed to use many strategies to deal with these difficulties and complete their tasks. However, think-aloud protocol revealed that even if they used a wide variety of strategies, they had difficulty in choosing the best concordance lines to guess the word meanings easily. Most of them chose concordance lines that were not representative of the intended word meanings, inappropriate for their language level, or included uncommon discipline-specific words or proper names they were not familiar with. This finding supported the previous findings in that D-DDL participants needed teacher guidance in choosing concordance lines.

Post-test higher scorers and post-test lower scorers differed in their use of strategies. Firstly, it was observed that when D-DDL participants chose a difficult concordance full of unknown words or terminology, higher scorers skipped to another concordance line without spending too much time whereas lower scorers spent too much time trying to make meaning of those concordance lines. Moreover, some lower scorers did not use any concordance choice strategy and they started from the first concordance lines and continued in order with the others. Higher scorers used strategies to deal with the unknown words. For instance, D-DDL higher scorers used pictures in COCA to guess word meanings when they had difficulty understanding concordance lines whereas lower scorers did not use them. Another example is that higher scorers in both D-DDL and I-DDL groups kept reading when they encountered unknown words whereas lower scorers did not keep reading and tried to translate the

concordance lines. Since they tried to translate the sentences, they focused on the unknown words too much trying to understand the concordance lines. This might have increased the cognitive load the tasks caused. These findings revealed that students' use of strategies may have had an effect on their vocabulary acquisition and students need training and guidance in their use of strategies.

During the task, both D-DDL and I-DDL students sometimes had incorrect guesses. The reasons behind their incorrect inferences are important because it was revealed that post-test lower scorers guessed word meanings incorrectly than higher scorers. Moreover, some participants reported during focus group interviews that when they had incorrect guesses, they easily forgot the word meanings. In light of the data obtained from the think-aloud protocol, the main reason for their incorrect guesses was the lack of confirmation of their hypothesis. Although most of the students in both of the groups performed hypothesis testing, some lower scorers did not confirm their hypothesis about inferred word meanings with another concordance line, which resulted in incorrect guessings. Moreover, they sometimes had wrong interpretations of word parts (such as prefixes and suffixes) but they were not able to realize it when they did not check to confirm their hypothesis. Overall, these findings showed that the lack of hypothesis testing affected vocabulary gains of the students, which uncovered the importance of guiding students in hypothesis testing as it is an essential part of "discovery learning" in inductive tasks (Bernardini, 2004).

The think-aloud protocol also revealed that D-DDL participants spent much more time completing their tasks compared to I-DDL participants. According to student responses in focus group interviews, the time-consuming nature of D-DDL was found to be one of the most important factors in decreasing students' motivation toward using D-DDL tasks. Therefore, it is important to understand the reasons for it. Data from the think-aloud protocol showed that D-DDL students needed longer time

to complete their tasks for the following reasons:

- more steps to access concordance lines in COCA (search phase)
- wait time in COCA
- more time is needed to scan the concordances
- reading more concordance lines is needed to form a hypothesis
- reading more concordance lines is needed to test the hypothesis

I-DDL students, on the other hand, read less number of concordance lines to develop a hypothesis and check it. Moreover, they did not have corpora-related technological problems. Therefore, they required less time to complete the tasks. These findings showed that when students were presented with the concordance lines that reflected the meanings of the target words more clearly, they spent less time searching for the concordance lines and they formed and checked their hypothesis more quickly, which highlighted the importance of teacher guidance in I-DDL.

Considering the third research question, pre-test and post-test results showed that I-DDL students received significantly higher scores from the words they learned during pair work compared to individual work in all three post-tests. As for D-DDL, although students received higher scores from the vocabulary items they learned in pair work in all the three post-tests, this superiority of pair work was not significant in meaning recall and form recall tests. However, it was significant in the meaning recognition test. These results showed that I-DDL benefited from pair work in all three levels of word knowledge, D-DDL group benefited from pair work only in the meaning recognition level. The possible reason for this difference was uncovered by the student responses during the focus group interviews. Some students in the D-DDL group believed that they could not benefit from pair work because their pairs were faster to guess the meanings, which caused them anxiety and decreased their motivation to complete the tasks. These findings showed that weaker students may

have difficulty in completing inductive D-DDL tasks and may not benefit from pair work when their pairs are quicker or more able in interpreting concordances and guessing word meanings (Vanestestăl & Lindquist, 2007). On the other hand, most of the students found pair work more effective than individual work because they were able to "scaffold" (Vygotsky, 1978) each other in four ways. During pair work, they helped each other by showing each other contextual cues that were important to guess word meanings, comparing guesses to be more certain, asking each other the meanings of the unknown words in concordance lines, and showing each other the best concordance lines that represented the meaning of the target words more clearly.

The fourth question was answered in light of the data obtained from the focus group interviews. Results uncovered that both D-DDL and I-DDL students had positive attitudes towards being more cognitively involved in their learning processes during inductive DDL tasks. They believed that being more mentally active in trying to guess the meanings of the target words had a positive impact on their vocabulary recall. Furthermore, both of the groups showed a positive attitude towards being able to observe how the target words were used in different sentence structures in multiple concordance lines. They believed that this helped them to be able to see the frequently used collocations, especially prepositional collocations, of the target words. They believed that this was important to use the target words in their own sentences correctly. In other words, they gained confidence in their speaking and listening skills. In addition to speaking and listening, I-DDL students believed that they improved their reading and listening skills since they believed that they improved their guessing from context skills. D-DDL participants also showed a positive attitude towards being able to see the words in authentic contexts and their frequency in these contexts, which helped them to be able to use the target words appropriately, as well. I-DDL students, on the other hand, did not express any attitude towards the authenticity or

frequency of the words in authentic academic contexts. Furthermore, both D-DDL and I-DDL students believed that DDL led to incidental learning of unfamiliar words while they were trying to guess the meaning of the target words. Unlike the I-DDL group, the D-DDL group also believed that they incidentally learned some grammar structures, as well. However, compared to the I-DDL group, more students from the D-D DL group reported that they experienced incidental learning.

Although a few participants in D-DDL reported that D-DDL increased their motivation, most of the participants in the I-DDL group reported that they were motivated by I-DDL tasks. Factors that affected their motivation positively were listed as follows for both of the groups:

- DDL tasks were different from traditional vocabulary tasks and this was fun.
- DDL tasks were exploratory, which made fun.
- They had the feeling of success when they were able to guess word meanings correctly.
- (For the D-DDL group) Changing places and having the lesson in the computer lab motivated them.

Both D-DDL and I-DDL participants also reported some factors that negatively affected their motivation. However, D-DDL and I-DDL groups reported different factors. I-DDL group believed that their motivation decreased in the following situations:

- They became frustrated when they were not able to guess word meanings correctly.
- When they were tired, they had difficulty with the inductive tasks.
- They did not like the feeling of being unsure about their inferring and they immediately wanted to check their dictionaries, especially in the first weeks of the interventional sessions.

D-DDL students expressed more factors that affected their motivation negatively compared to the I-DDL group. They believed that:

- D-DDL tasks were time-consuming.
- D-DDL was not appropriate for prep students due to higher-level language in corpora.
- Technological problems such as the registration process and wait time in COCA after successive searches were frustrating.
- Both COCA and MICASE did not have a friendly, simple, and modern look.
- While some students found the KWIC view in MICASE useful to observe the frequently used collocations easily, some students found it confusing.

Even though D-DDL students found COCA beneficial, especially for checking frequency information and collocations of the words, they reported that they did not plan to use it at home because it was time-consuming. Some participants reported that they planned to use COCA for their future academic studies but not in prep year due to its higher-level language. They also believed that the advanced language in COCA negatively affected their self-confidence.

Participants in both groups believed that when each concordance line had different topics, such as economics and sociology, they found it confusing and difficult to make connections between the concordance lines, which made it difficult to guess the meaning of the target words easily. Hence, when students' suggestions were asked, participants in the I-DDL group suggested that the concordance lines presented to them should be on the same topic. They also suggested that having less than ten concordance lines would be better to guess word meanings clearly and more quickly. Similarly, D-DDL group participants also suggested that they should be able

to sort out the texts in COCA based on their topics and language levels. They also suggested that D-DDL should be introduced in prep year, but it should be used in departmental years or should be given as optional homework.

Although think-aloud protocol and focus group interview showed that the D-DDL group needed teacher guidance and had difficulties with the direct data-driven learning experience, pre-test and post-test showed that they had similar vocabulary gains as the I-DDL group who had teacher guidance. The reason may be the fact that the D-DDL group used visuals and they had further exposure to the target words in *YouGlish* videos, which may have helped them to remember the words better especially if the students were visual learners. Another reason may be that the D-DDL group paid attention to more aspects of word knowledge such as frequency, register, and spoken forms. This may have helped them to have richer and stronger meaning representations. A third reason can be that they used their world knowledge, unlike the I-DDL group. This may have helped them internalize the meanings of the words.

All in all, the present study filled in the gap in the literature comparing the effects of D-DDL with I-DDL on learning new vocabulary. It also shed light on the student behaviors during D-DDL and I-DDL using a comparative approach.

6.3 Pedagogical implications

This study offers pedagogical implications for English language teachers and material developers. The current study supported the previous research (Jalilifara et al., 2014; Vyatkina, 2016) in that it showed that I-DDL and D-DDL practices can be equally effective in both vocabulary recall and recognition although there was no teacher guidance in D-DDL. Based on these findings, it is suggested that teachers can choose either D-DDL or I-DDL practices to use in their language classrooms based on their lesson objectives and student needs.

The current study concluded that students had negative attitudes towards the time-consuming nature of D-DDL, higher-level language in online corpora, and technical problems they had during D-DDL practices. Thus, as Smart (2014) suggested, I-DDL can be preferred at school if teachers do not prefer their students to experience these difficulties. On the other hand, students also reported that D-DDL had benefits in giving them an awareness of frequency, register, and spoken form aspects of word knowledge, which are important in order to show students the use of target vocabulary items in different contexts. Furthermore, students had positive attitudes towards being able to explore words' frequency, register, and pronunciations using COCA. Moreover, students found D-DDL beneficial for incidental learning and they investigated the words' aspects, such as collocations, further driven by their own curiosity. Thus, based on these findings, the benefits of D-DDL should not be underestimated. Therefore, it can be suggested that students can be encouraged to use D-DDL as a further activity at home after they discover word meanings with I-DDL activities during classes. This way, students can be given opportunities to further explore target vocabulary items that they learned through I-DDL in the classroom and their use in a lot more authentic contexts. This is also an opportunity for students to learn more vocabulary items and grammar structures with incidental learning and curiosity-driven corpus search (Aston, 2001).

Supporting Gilquin and Granger’s (2010) and Smart's (2014) suggestions, the results of the current study highlighted the importance of training on how to interpret corpus data as well as how to use corpus interfaces before DDL practices. While the previous research mostly focused on word-based word attack strategies, the current study found that concordance-based word attack strategies are also important, especially in the D-DDL condition, which is usually overlooked in the

literature, to my knowledge. Concordance-based word attack strategies that students used in this study may inform material development for I-DDL by selecting concordance lines to be presented on student worksheets and training plans of teachers for D-DDL. Moreover, the importance of training for guessing from context in I-DDL is not sufficiently highlighted in DDL literature. In addition to these, hypothesis testing should also be encouraged and trained (Sternberg et al, 1983) because hypothesis testing was found to be an important factor in participants' vocabulary recall and recognition as only post-test lower scorers avoided hypothesis testing in the current study (Chujo et al., 2009).

Supporting Vannestestăl and Lindquist's (2007) suggestions, the current study showed that some students may find pair work difficult in interpreting concordances when their pairs are faster. Therefore, teachers should consider that sometimes peer guidance may not be sufficient and may negatively affect some students' vocabulary gains or their motivation. Being careful in assigning pairs in pair work during DDL practices and being able to observe the dynamics between the pairs is of great importance. It should be taken into consideration that DDL tasks, especially D-DDL, are different from traditional classroom activities in that there are many components of these activities such as interacting with the computer. Moreover, these inductive DDL tasks require deeper cognitive processes. Therefore, it should be taken into consideration that pair work may function differently for DDL.

6.4 Limitations and suggestions for further research

The study had its limitations that could formulate suggestions for further research. The immediate post-test in the study showed that D-DDL and I-DDL had similar effects on vocabulary recall and recognition. However, the long-term retention of the target words was not tested. A delayed post-test was needed to measure the longer-term effects of D-DDL and I-DDL practices on vocabulary gains. It would give a better understanding of whether target vocabulary learning actually occurred especially in retention levels.

The current study explored that students in both D-DDL and I-DDL groups believed that they improved their use of the target vocabulary items in their own sentences during speaking and writing. However, the study did not measure their productive knowledge of the target vocabulary with post-tests in order to support students' beliefs. Therefore, a further study may use controlled and uncontrolled production tests in order to measure their vocabulary gains at the production level. Moreover, the current study found that students paid attention to multiple aspects of vocabulary knowledge such as collocations. However, it did not measure if the students learned these aspects of the target words with vocabulary tests. That is why a further study may measure the effects of D-DDL and I-DDL on participants' learning of multiple aspects of vocabulary knowledge with appropriate vocabulary tests.

The current study concluded that both D-DDL and I-DDL were effective in vocabulary recall and recognition. However, the highest scores students received on vocabulary tests was 40 out of 60. This may be because there was no follow-up exercise after they came up with the correct meanings of the words and they encountered the target words only once (Chujo et al., 2009). Therefore, further studies may investigate the effects of D-DDL and I-DDL accompanied by follow-up exercises.

The study aimed to compare the effects of pair work and individual work in D-DDL and I-DDL practices on vocabulary learning through pre-test and post-test design. It also revealed student attitudes towards pair work and individual work with focus group interviews. However, these were not sufficient to have insights into what really happens in pair work and individual work during DDL practices. Understanding how pair work functions during both of the DDL practices would give insights into one of the findings of the current study that pair work did not benefit D-DDL in the same way it benefited I-DDL groups. Therefore, the study could have used think-aloud protocol sessions with pair work tasks, as well. The think-aloud protocol would be useful to observe what students do in the three stages described by Carter and McCarthy (1995) as the stages of effective learning through corpus consultation, namely "illustration", "interaction", and "induction". The data could have been compared to the one from individual work. This way it could have been observed how student behaviors showed differences and similarities during pair work and individual work.

In the current study, participants had two weeks for individual work and two weeks for pair work DDL tasks. This time phrase was not sufficient for students to adapt to these conditions during DDL practices that were also new to them. Thus, further DDL studies can adopt an experimental design where pair work and individual work are assigned to different experimental groups. These studies can investigate the different effects of these conditions on students' vocabulary gains from D-DDL or I-DDL or vocabulary learning behaviors during D-DDL or I-DDL practices. The study can also give better insights into pair work during DDL practices with the use of the conversation analysis method.

In the current study, the target words were chosen randomly among the unknown words to all participants after the pre-test. This was one of the limitations of the current study since there was a need for structured criteria to choose these words such as choosing them based on concreteness or transparency. Further studies can replicate the current study with a target words list that was created with more structured methods.

The current study explored student attitudes towards the D-DDL and I-DDL practices. However, there is a need for studies that investigate teachers' attitudes to these practices and compare them from teachers' perspectives.

Lastly, although the number of participants in the current study was sufficient, it was still small to generalize the findings to all learning contexts. Therefore, more research is needed to compare D-DDL with I-DDL in various learning contexts and with various target structures. Furthermore, most DDL studies are conducted with young adults. However, there is a need for studies that examine DDL with various student age groups such as young learners. They may have different attitudes towards D-DDL and I-DDL since their aims for studying language may differ from that of young adults. Moreover, there is a need for longer-term studies to investigate the longer-term effects of D-DDL and I-DDL practices.

APPENDIX A

TARGET VOCABULARY

1. Derive
2. Comply
3. Cooperate
4. Complement
5. Convert
6. Prior
7. Distinct
8. Outcome
9. Conflict
10. Reluctance
11. Consult
12. Fund
13. Access
14. Accompany
15. Interaction
16. Inherent
17. Complement
18. Consent
19. Behalf
20. Adequate

APPENDIX B

MATERIALS FOR D-DDL CONDITION

Worksheet 1

1. *Work in pairs.*
2. *Go to COCA and MICASE*
3. *Search for the words*
4. *Use the concordances to guess the meanings of the words*
5. *DO NOT use your dictionaries or translate function of the corpora*
6. *You can write the meanings in Turkish or in English*

word	meaning
derive	
comply	
convert	
cooperate	
compensate	

Worksheet 2

1. *Work in pairs.*
2. *Go to COCA and MICASE*
3. *Search for the words*
4. *Use the concordances to guess the meanings of the words*
5. *DO NOT use your dictionaries or translate function of the corpora*
6. *You can write the meanings in Turkish or in English*

word	meaning
prior	
distinct	
outcome	
conflict	
reluctance	

Worksheet 3

1. *Work in pairs.*
2. *Go to COCA and MICASE*
3. *Search for the words*
4. *Use the concordances to guess the meanings of the words*
5. *DO NOT use your dictionaries or translate function of the corpora*
6. *You can write the meanings in Turkish or in English*

word	meaning
consult	
fund	
access	
accompany	
interaction	

Worksheet 4

1. *Work in pairs.*
2. *Go to COCA and MICASE*
3. *Search for the words*
4. *Use the concordances to guess the meanings of the words*
5. *DO NOT use your dictionaries or translate function of the corpora*
6. *You can write the meanings in Turkish or in English*

word	meaning
inherent	
complement	
consent	
behalf	
adequate	

APPENDIX C

MATERIALS FOR I-DDL CONDITION

Worksheet 1

1. *Work in pairs*
2. *There are 5 words with 10 example sentences for each of them*
3. *Read the example sentences taken from corpus*
4. *Guess the meanings of the words in green*
5. *You can write the meanings in Turkish or in English*

1. “I'm actually not a fan of the Chris' whole blog post idea thing, but that has nothing to do with whether or not others **derive** value from it.”
2. “Because people mean a wide variety of things by the popular term " spirituality " -- most of which **derive** from Eastern religions, animism or New Age”
3. “It happens and may not feel good, but I believe a person can **derive** some satisfaction in the effort.”
4. “Like any analogy, the analogy of ours that Yoshino criticizes was meant to illustrate a limited point: how a community can **derive** its structure and defining norms from a certain end, even though it is valuable in itself and not merely as a means to that end.”
5. “Because for some people, weight and self esteem are completely independent of each other, as people can **derive** their self esteem from a variety of factors. But what about body image? Can you have a positive body image and be overweight?”
6. “Pelagians, who **derive** their name from Pelagius, a fifth century British ascetic, deny the doctrine of Total Depravity altogether.”
7. “Some organisms **derive** the energy they need through oxidation of inorganic compounds.”
8. “It's too bad the Bible doesn't teach better morals, since some people actually try and **derive** their morality from it.”
9. “And even if it wasn't in part a joke, asking to be addressed by the professionally appropriate title is just a request for professional courtesy. It doesn't mean you that you **derive** your self-esteem from your title. It just means that you expect it to be used in contexts where it's appropriate.”
10. “I have friends who buy the latest toys, but enjoy the heck out of them and others who **derive** happiness from traveling. Judging solely by your last post and this one, I think your happiness is tied to the amount of money you have.”

word	meaning
derive	

1. “The journalists accepted into the online course will pay a $60 administrative fee and a certificate of participation will be issued to those who **comply** with the course's requirements.”
2. “Starting from scratch with the 1984 framework plan and updating it just enough to **comply** with state and federal laws”
3. “I mean, what with all of that presiding he's been doing, it's clear that the President has had hardly a spare moment for such fails to **comply** with our terms of use may lose their posting privilege.”
4. “You're going to see almost civil disobedience. People are saying,' I'm just not going to **comply**.'”
5. “If we pass new regulations the government has to hire more people to enforce them. Companies have to hire more people to ensure they **comply** with the regulations. That means more jobs.”
6. “Health insurance is in general mandatory for residents of Japan, though there is no penalty on individuals who choose not to **comply**, and around 10% of the population does not enroll.”
7. “For those who **comply** with the speed limit, there is a good chance that you are not going to have an accident.”
8. “Employment in this field may not be that easy because you will have to **comply** with a set of requirements and qualifications.”
9. “Generally speaking, a Tier 3 country' does not fully **comply** with the minimum standards of human trafficking prevention, protection of victims and prosecution of traffickers and is not making significant efforts to do so'.”
10. “While I was able to testify on his behalf and get statements on the record about our desire to **comply** with state law and our goals as a professional organization, the jury was not allowed to hear it.”

word	meaning
comply	

1. “So online inconsistencies are on a significance for the individual topics know problem. There could be bit of crashing of important and right needs with the computer, adobe acrobat **convert** pdf to excel.”
2. “Since half of silver demand is industrial, it could drop in the event of economic crisis if investment demand does not pick up the slack. However, it will still be above what I paid for it last year. I see no reason to **convert** it to cash (I have plenty of everything) in hopes of timing the market because I know that is going to be worth less in the future.”
3. “I feed just oats, hay and water and my horses receive and additional help pasturing in large padocks six hours per day. I'm a fanatic " naturalist " with very good results at racing. But when in race day I **convert** from " naturalist " to " madicatist ".”
4. “But hypothetically, I think it would be possible for a form of plant life to evolve to reflect blue rather than green, if that were the most efficient way for that life to **convert** light into energy.”
5. “At this point, we need to first **convert** our image to Black and White by hitting " V ". “
6. “The efficiency of solar steam is due to the light-capturing nanoshells and nanoparticles that **convert** sunlight into heat.”
7. “There was plenty of room at the time. when august rolled around they had to open up another kindergarten class and **convert** the art room to a 3rd grade class.”
8. “If you want to **convert** America to a " green economy " to create jobs, after Spain has proven the green economy destroys three times as many jobs as it creates and leads to 20 percent unemployment, you might be a socialist.”
9. **“Convert** solar and wind to hydrogen for use during dark hours. Also power fuel cells using natural gas, biogas or other fossil fuels.”
10. **“Convert** the extra computer into a gaming server for your favorite game.”

word	meaning
convert	

1. “I myself received an unrequested wake-up call on Monday about an hour before my own alarm was set (and couldn't go back to sleep), but the hotel offered me a free massage to **compensate** for it, so I'm not sure that actually counts as bad luck.”
2. “I know that the Chinese government has been using artificially repressed interest rate to steal the wealth from household in order to **compensate** bank loss.”
3. “Keep your eye on the clock; view the time of possession and see how Gailey is going to **compensate** for lack of a few quality receivers.”
4. “There is a problem with this strategy. You've sacrificed your profits in the second half of the month. Once money has been spent, it is a sunk cost. Lowering your budget to **compensate** for overspending is misguided and will lead to lower profits.”
5. “If you're in the habit of reading labels, you've no doubt realized it's difficult to find any kind of processed, packaged food that does not contain some form of added sugar or high fructose corn syrup. And low-fat or " diet " foods tend to be the worst of the bunch. The reason for this is that when fat is removed, most of the flavor goes with it. To **compensate**, sugars are added.”
6. "Ultimately, we aim to untangle the impact of bird loss on the entire food web, all the way down to plants, " she said. " For example, has the loss of birds also led to an increase in the number of plant-eating insects? Or can this increase in spiders **compensate** for the loss of birds?"
7. “In fact, for an investment as risky as an internet startup, 6% a year isn't nearly enough to **compensate** for the risk the investor is taking.”
8. “Also remember that most fat-burners have a diuretic effect: meaning that they increase water loss. That said-you MUST drink more water than normal when you are consuming fat-burners to **compensate** for that”
9. “We work hard to **compensate** for our shortcomings.”
10. “What emerges is a little girl lost, constantly trying to **compensate** for her early loss of her mother and her distant relationship with her father. “

word	meaning
compensate	

Worksheet 2

1. *Work in pairs*
2. *There are 5 words with 10 example sentences for each of them*
3. *Read the example sentences taken from corpus*
4. *Guess the meanings of the words in green*
5. *You can write in Turkish or in English*

1 **"Prior** to Bean's surgery, he addressed his decision to donate a kidney to Scott."
2 "Roger Cheng is an executive editor for CNET News. **Prior** to this, he was on the telecommunications beat and wrote for Dow Jones Newswires and The Wall Street Journal for nearly a decade."
3 **"Prior** to the iPhone, only tech-savvy people installed third-party mobile. Today, every phone has a mobile app store that allows total beginners to download, install, and remove apps."
4 "I'm also a single mother of one 9 year old daughter. **Prior** to the accident, I worked the previous 15 years as an R.N. at various charity hospitals in 3 different states."
5 **"Prior** to my arrival, all recruitment was done at Corporate and in the field by managers."
6 "At its peak, **prior** to World War II, the Soviet Union's " gulag " system incarcerated roughly 800 out of every 100,000 residents. Today, the U.S. incarcerates roughly 743 people out of every 100,000 residents."
7 "It's about her finding her way back home, back to happiness, and having to take the steps necessary to fix the damage she caused six years **prior."**
8 "I think that the grand ideas and personal values that form the ongoing foundation of America, the ideas and values that motivated our founders, many/most everyday Americans, and all **prior** presidents (even Carter) are alien to President Obama."
9 **"Prior** to founding MineThatData, Kevin held various roles at leading multichannel brands, including Vice President of Database Marketing at Nordstrom."
10 "My **prior** experience with exercising includes Cosmo workouts, yoga DVDs, and faking a fainting spell in middle school phys ed. What do I do at the gym?"

word	meaning
prior	

1. “If people were unequal, they could neither understand each other nor plan for the future or foresee the needs of later generations. If people were not **distinct** from each other, then both action and speech would be pointless; since they lack any difference, they would have no need to be understood.”
2. “They looked liked twins at eight week old powder puffs, but today we see some very **distinct** differences in their appearance.”
3. “Jones has also noticed the **distinct** difference in flavor. " It's much smoother on the palate, " he remarks.”
4. “This is not communism and has some very **distinct** and important differences.”
5. “There is a mistaken notion that blogging and social media are different and **distinct** things. Blogs are social (and alternative) media.”
6. “I think each venue -- linked in, twitter, Facebook, etc. -- has it's advantages for **distinct** reasons.”
7. “Human freedom is thus **distinct** from the kind of freedom talked about by animal liberationists. Human freedom is largely our ability to act free of external constraints, but also freedom from the compulsion of internal drives, vestiges of our animal nature which have been repressed by civilization (Freud).”
8. “A sizable quantity of Baltimore's row houses are clad with formstone, a **distinct** feature of Baltimore's row houses, typically found in working class areas of the city. Marble Steps also set Baltimore's row houses distinct from other cities' row houses.”
9. “Love in this second sense -- as **distinct** from being in love -- is not merely a feeling. It is a deep unity.”
10. “The city is made up of twenty different neighborhoods or " arrondissements, " each with its own **distinct** character and attractions.”

word	meaning
distinct	

1. “Please conduct your own research as I can not be held accountable for any undesirable **outcome.”**
2. “You may be thinking, " well, I'm in pretty good shape " and that may be true, but the competition in wrestling continues to get better and it is do or die time when stepping on the mat. There is no one to depend on or blame for the **outcome**.”
3. “How do you think countries in Asia view the **outcome** of the U.S. presidential election? Karl Eikenberry: Overall, I think the countries of Asia will view President Obama's reelection as positive.”
4. “Armageddon as likely, if not inevitable, **outcome** of humanity's destruction of nature. " The sad reality is that we are in danger of perishing from our own stupidity and lack of personal responsibility to life ".”
5. “The California Supreme Court heard arguments last week in a class-action lawsuit described as a clash between free and unfettered e-commerce and consumer privacy rights. The **outcome** will affect the millions of online shoppers in the Golden State, as well as hundreds of millions of online transactions.”
6. “Glad you guys are on it. Hoping for a positive **outcome** in this case. Looking forward to the news tonight.”
7. “They might get arrested, it might impact upon their careers, or the man might end up getting famous (as did John Bobbit), which is not the desired **outcome**. Nowhere is the humanity, dignity or bodily integrity of men suggested as a reason for not mutilating men.”
8. “Monday morning quarterbacking " is crucial in learning from past mistakes, successes, and and all the in betweens; as well as to examine what choices for similar situations in the future could produce a more positive **outcome**.”
9. “The rules that the party elite can change whenever they want to ensure the **outcome** they want?”
10. “A benevolent attempt to offer you just what you need, no more and no less, to do what you need to do, or what the world needs of you. The **outcome**? Real action in the world.”

word	meaning
outcome	

1. “This pretty much sums up the current Internet controversy. This is just the latest bout between Internet puritans and Internet marketers and that their **conflict** will not be solved any time soon.”
2. “Peace is not the absense of **conflict**; it is the ability to manage conflict by peaceful means.”
3. “The government submitted in its motion, " The district court's overbroad, worldwide injunction is erroneous as a matter of law and threatens tangible and dangerous consequences in the conduct of an active military **conflict**."
4. “This right is curtailed by the law regarding abortion. They are in **conflict**, and this conflict must be resolved. This will require a referendum.”
5. “Despite the portrayal of Gaza as somehow this isolated **conflict** between Israel and the Palestinians, the reality is the political intrigue behind the fighting reaches Tehran and New York.”
6. “There may not even be much of a puzzle here. Studies that have found systematic differences in the frequency with which democratic states enter into **conflict** under left-leaning governments relative to right-leaning governments.”
7. “We are in **conflict** with each other and our world is being destroyed. There is crisis after crisis, war after war; there is starvation, misery; there are the enormously rich clothed in their respectability, and there are the poor.”
8. "Countries, when they are in **conflict** or war, they always think that a larger population makes them stronger"
9. “Like other enemies in history, their objective was to impose their beliefs on the Jews through force. There conflict with the Jews was a **conflict** of ideas.”
10. “Kathleen Sebelius to stop taking Communion until she disowns her support for the " serious moral evil " of abortion. That put the church in **conflict** with a rising star of the Democratic Party.”

word	meaning
conflict	

1. “Hajera gathered the courage to talk with her and express her desire to return to school. She shared her background and the **reluctance** of her father and brothers to spend the family's money on her education.”
2. “I see that, while you are engaged with this comment thread to a degree, you still remain silent on my questions. I don't know you, but I suspect you realize by now just how much you've stepped in it, and I can understand your **reluctance** to answer those questions.”
3. “It's this lack of critical thinking skills, or at least the **reluctance** to use those skills.”
4. “Until business perceives that the government is not going to continually change the rules of the game, there will be a **reluctance** to commit resources and hire people. And until that happens, the economy will languish.”
5. “My point is that the model is evolving in the face of new evidence. What I don't understand is the **reluctance** of the child-abuse community to look back at possible mistakes in the past.”
6. “Their **reluctance** to participate in the largest food experiment in the history of our species is directly reflected in the world's increasing resistance to accepting food exported from the U.S.”
7. “The phenomenon many call " math anxiety. " That's the " fear of math " or **reluctance** to do it that has been listed as a possible cause for the huge decline in the number of young people pursuing science majors in schools, and the equally huge disparity between men's and women's feelings about mathematics.”
8. “Governor Dayton seems disturbed or confused by the **reluctance** of some people to pay higher taxes.”
9. “I understand your **reluctance** to name yourself as a member of a movement that's most needed by people less fortunate than yourself.”
10. “The colonel of the post who heard about Lowry's **reluctance** sent a clear message, as Lowry recalls. " I understand you have refused to enter into an engagement with Mr. Louis.”.”

word	meaning
reluctance	

Worksheet 3

1. *Work individually*
2. *There are 5 words with 10 example sentences for each of them*
3. *Read the example sentences taken from corpus*
4. *Guess the meanings of the words in green*
5. *You can write the meanings in Turkish or in English*

1. “For men, at times when testosterone reaches the hair follicles it gets converted to DHT and causes hair fall. Similarly in women, hormonal imbalances also cause hair loss. In this case it is best to **consult** your doctor for a dietary plan.”
2. “On any matter relating to your health or well-being -- and prior to undertaking any health-related activity -- **consult** an appropriate health professional.”
3. “Always **consult** a veterinarian about the nutrition for your dogs. Make sure you find some brand that your dog enjoys.”
4. “When taking on a large landscaping project, you may want to **consult** with a professional first to get their ideas.”
5. “The AutoGuide network operates more than 100 automotive forums where our users **consult** peers.”
6. “Once a tie-in has been determined, the next important consideration for your project is the post placement and screened openings. It is crucial to **consult** a professional with these to avoid any structural issues.”
7. “You should **consult** with a healthcare professional before starting any diet, exercise or supplementation program.”
8. “Hey, these are all great thoughts and ideas, and I'm going to **consult** with my graphic designer about them.”
9. “Do not use while operating a motor vehicle or heavy equipment and if erection lasts more than four hours, **consult** your physician.”
10. “Survey reveals many fear is that the international Alzheimer cancer. But there was no hesitation on whether to **consult** a doctor if symptoms appeared.”

word	meaning
consult	

1. “The country has to rely on international aid from organizations such as the International Monetary **Fund** in order to remain financially solvent, and inflation of 18% in Sierra Leone is a serious problem.”
2. “If the political Status Quo alienates the majority by making them pay more taxes, they risk losing power in the next election. If they alienate the top.5% who **fund** their multi-million-dollar campaigns, then they will also lose power.”
3. “Build a prototype, prepare a marketing plan and a business plan, put together a team and stay alive until you can find the money to **fund** all your plans.”
4. “If you have a bank CD and a mutual **fund**, you technically have allocated your assets among two investments.”
5. “Ellie’s classmates, friends and family have raised money for the **fund** through birthday parties, lemonade stands, cookie sales, a rock concert.”
6. “Why was the game cancelled? The answer is quite simple: no publisher was willing to **fund** the game, and it was too big to make ourselves.”
7. “Each **fund** has a particular investment objective. These will include large company stocks, or small company stocks or global stocks, etc.”
8. “Why should we not just create a Global **Fund** to Improve Health Systems. Well, I'm not a marketing expert but it's just not a romantic cause.”
9. “After the election, you won't have any pulling power, any influence to force them to commit to drop their intentions to continue to fully **fund** war and homeland security and to gut social programs, to tax the middle class and to reward corporations with lower taxes.”
10. “Why should we not just create a Global **Fund** to Improve Health Systems. Well, I'm not a marketing expert but it's just not a romantic cause.”

word	meaning
fund	

1. “Then there is there is the meaning of freedom and rights. Again men in some cases are so insecure they don't want to accept real equality if they did and guaranteed equal **access** to success and of course equal participation in caring for and rearing of children many abortions would not happen.”
2. “Disability rights activists dressed in beach attire took over the president's office to protest a lack of **access** to hotel swimming pools.”
3. “We found the perfect place to park that gave us unobstructed view of the screen -- not too close, not too far -- and easy **access** to leave when the film ended.”
4. “I'd give them a smart phone. They can **access** the Internet everywhere, they can read e-books anytime, they can keep their schedules with them, and it lets them communicate in any way and with any one they want.”
5. “You can get **access** to that kind of research by Googling " Cherokee Genealogy, " where you will find many sites such as All Things Cherokee, or Native American Data.”
6. “If you are a parent of a child who has an IEP, you know that schools must ensure equal **access** to educational opportunities for students with disabilities and provide a free, appropriate public education.”
7. “As long as spying agencies have **access** to data stored by such networks, web companies risk becoming extensions of these agencies.”
8. “The general trend during 10 years was toward greater prosperity, as measured by **access** to clean drinking water, ownership of more livestock, and living under an improved roof rather than the traditional thatch.”
9. “At the same time points of views need to be given the open court of world public opinion for discussion and dissemination so that people in all countries have **access** to the knowledge learnt in any part of the world.”
10. “Commentary and analysis focussing on Africa to persuade others to become socialist and act for themselves, organizing democratically and without leaders, to bring about a world of common ownership and free **access**.”

word	meaning
access	

1. “Parents should **accompany** children if they are younger than 12-years old. Children should walk -- not run -- from house to house.”
2. “I **accompany** him just so it feels like we're doing it " together " and we cant blame each other for not helping.”
3. “Rapper Jay-Z is scheduled to co-joined Springsteen in Ohio. Meanwhile, Romney's presidential candidate will use Kid Rock music star to **accompany** him on the last day.”
4. “As she remembers the incident, Mariam recounts what had become a tradition for the family. Most days, from 11am until 6pm, she used to **accompany** them to the beach and make them lunch as they worked: " On that day, I did not go with them. I was at home making them lunch when the incident happened.”
5. “So cities have created new, highly visible jobs for their firemen. The Wall Street Journal reported recently, " In Los Angeles, Chicago and Miami, for example, 90% of the emergency calls to firehouses are to **accompany** ambulances to the scene of auto accidents and other medical emergencies.”
6. “Dads and father figures across New York State are encouraged to **accompany** their children to school on Thursday, September 20, as part of an ongoing effort to promote healthy families.”
7. “Lauren, the terrified staff writer about to **accompany** me to the airport, was none too amused at my joking.”
8. “Katherine found her copy of the photograph straightaway only because she was in the middle of selecting images to **accompany** her edition of her father's letters.”
9. “The problem in this case is that I didn't have to gamble. I could've just offered to **accompany** the guy to his car, as I finally learned to do that last time.”
10. “Every Animoto video requires you choose a soundtrack to **accompany** the photos, video clips and words that come together to create you video.”

word	meaning
accompany	

1. “Her dedication to speaking up for herself and others is represented by countless hours of thought, writing, communication, and **interaction** with the community.”
2. “Since she already spoke fluent english, no one taught her the British rules of polite **interaction**, and some of the people she encountered assumed was intentionally flouting them, which was not at all true.”
3. “When he got out of college in 1995, he missed the daily **interaction** amongst the meteorology students and professors.”
4. “And if not, at least I will have danced to my own music. That's the minimum return I am willing to accept for any from social **interaction**.”
5. “Basically all human social **interaction** affects status in some manner. Nearly any human social behaviour (if not every) can be described in terms of status.”
6. “They put forth the front-line perception of your brand? for better or worse? one interaction at a time. How can you make the best of each customer **interaction**?”
7. “It reminds me of the documentary Promises, about the **interaction** between Israeli and Palestinian children, in that the relationship between the Western beauty school instructors and the Afhgan students hints at an optimism for the future, despite all the horror and death we know about.”
8. “These are not necessarily the best 4 player games, but these are games that work well with two couples. Most of them have lots of **interaction** and are fairly easy to learn, or they work very well with four gamers.”
9. “This right here can be exploited a lot, any romantic **interaction** start with a transfer of resources from the men to the women, and the relationship is no different.”
10. “Sometimes I felt and saw my **interaction** with people as if I was standing way up high on the mountain gazing down at people and lazily waving at them to climb up MY WAY.”

word	meaning
interaction	

Worksheet 4

1. *Work individually*
2. *There are 5 words with 10 example sentences for each of them*
3. *Read the example sentences taken from corpus*
4. *Guess the meanings of the words in green*
5. *You can write the meanings in Turkish or in English*

1. “Personally, I am in the middle on this issue and am still watching events unfold but can tell you that watching wolves hunt has shown me the **inherent** need for survival -- man and animals alike -- and that the right to survive is universal.”
2. “Given climate change, drought, storms, the challenges of feeding the earth's population without destroying the planet, plus the health problems **inherent** in the America diet, and the sickness and ugliness of many of our landscapes, gardening may be the most significant of all beats.”
3. “Physical activity, especially by children, promotes the harmonious growth of the body, on a psychological level rather the competition **inherent** in any sport, helps to control emotions and strengthens self-esteem.”
4. “But Sandy gave me reason to tune back in, and be impressed all over again at the **inherent** goodness of our president.”
5. “We know there are some **inherent** " good sleeper " qualities (outside of parenting) in some babies and vise versa.”
6. “Ireland was independent of the English Parliament but also elaborated a theory of natural **inherent** rights of men.”
7. “Socialism believes in the **inherent** dignity of all individuals, while fascism seeks to purge society of those it deems inferior.”
8. “We'll see if he has an understanding of the **inherent** evil nature of man or if he views life through rose colored glasses.”
9. “Many games are combat-based, right? Or maybe puzzle-based. They have this challenge **inherent** to them, which means your fiction has to support a lot of fighting with somebody.”
10. “Surely, we should all, as individuals, be considered equal in terms of **inherent** rights, but we know that we're not equal in terms of abilities.”

word	meaning
inherent	

1. “In The Case of Mr.Pelham we **complement** each others talents, inspired in fabric prints we develop our patterns that we hand print on our cases.”
2. “And surprisingly, many athletes tolerate the high fiber content well and don't report digestional issues like you'd expect from a high fiber food. In my opinion, they make for a perfect **complement** to quicker energy foods/drinks on the bike.”
3. “The truth is our services do what they are told at the time and when that time comes the decision makers consider what's possible vs. traditional roles. No problem. The branches can pursue their traditional roles but we always **complement** each other and rarely fight alone.”
4. “Charter schools serve as a choice and **complement** to traditional schools that have an attendance zone.”
5. “If both sexes are always there in everyone, then so are the qualities related to these sexes. It means that you are potentially whole by yourself. A partner of the other sexe is not necessary to **complement** you.”
6. “There's a lot to be said for simply being considerate towards each other, and letting your respective strengths and weaknesses **complement** each other (and they will be different for each couple, one may be organized, the other not, one good at household repairs, the other better at balancing the checkbook, etc.).”
7. “I am a strong feminine woman with bold ideas, and I need a strong mentally masculine man to **complement** and balance me, not some whipped head-tucked man-boy that cowers whenever I have a girl tantrum.”
8. “’ Tell Me A Story’ is a song you can get lost in. It's full of space, and while the song has a lot of parts to it, they all **complement** each other and fit together to provide a very reflective ambiance.”
9. “You will **complement** each other's strengths and compensate each other's weaknesses.”
10. “which **complement** each other. A large number of other pictures illustrating how amazing this hotel is going to be can be seen here.”

word	meaning
complement	

1. “The copyright forbids you to reproduced or distributed any material anywhere on the Internet or offline without a written permission and **consent** from Us.”
2. “Do you know these guys don't even have your **CONSENT** or PERMISSION to be?”
3. “We encourage you to link to our blog posts, but please do not copy or re-publish photos, text or tutorials on other sites without our **consent.”**
4. “Delays are critical: if the parents are difficult to find or talk to, then being required to find them and gain their **consent** might be an obstacle to obtaining an abortion.”
5. “She can ask, in most jurisdictions, for a court or judge to act in loco parentis, so in effect, she can have an abortion without parental **consent**.”
6. “Found that Daniel couldn't, which left him little choice but to intervene in the situation and order the standard of care with, or without, his parent's **consent**.”
7. “Each year almost 25,000 boys under the age of four are subjected to painful, sometimes dangerous and life altering surgery without their **consent** or medical cause.”
8. “All that in mind, the New York City Board of Health voted to require to get written **consent** from a baby's parents before performing the operation.”
9. “But what if they suddenly touch you without your **consent**? How would you feel if you were incessantly bombarded with calls, texts, emails and tweets?”
10. **“Consent** is the right to say no as well as yes. You can make his decision for him because he is not competent to make the RIGHT decision.”

word	meaning
consent	

1. “Federal public lands are managed by the government on **behalf** of all Americans.”
2. “They were given an open door of unlimited opportunity and privilege to witness on **behalf** of the person and purposes of the Messiah.”
3. “All experiences and body types are unique and I am not speaking on **behalf** of all.”
4. “I don't pretend to speak for all vegans nor do I claim to know all vegans, I can only speak on **behalf** of myself and my opinions.”
5. “Actually, I think in that situation we’re really offended on **behalf** of someone else when their status is lowered.”
6. “San Jose refused to dismiss a lawsuit that seeks class-action status on **behalf** of thousands of PayPal customers nationwide.”
7. “I apologise on **behalf** of the civilised people in the world for the blinkered, philistine pig ignorance of the posters.”
8. “I testify, assert and affirm without reservation, on **behalf** of all those who have dedicated their lives to the ending of secrecy.”
9. “At that time We are the decision makers on **behalf** of the church and should not abdicate or surrender this responsibility.”
10. “Josh, allow me to speak up on **behalf** of Sir Willian Blackstone; yes, he probably was more influential to the development.”

word	meaning
behalf	

1. “You need to keep your scalp hydrated fully and full of nutrition so drink a lot of water always and eat an **adequate** amount of fruits and vegetables.”
2. **“Adequate** nutritional intake and regular exercise during childhoos and adolescence, both are necessary for development.”
3. “Perhaps in both cases the guilty parties have what they think are **adequate** reasons for that the other side finds objectionable?”
4. “People from lower ranks receive high-school educations, so that any monopoly of formal training **adequate** to these jobs is no longer possible.”
5. “There can be no functioning manmade global economy without **adequate** natural resources and global ecosystem services that only the Earth can provide.”
6. “Who have failed to provide the training, resources and **adequate** support necessary to effectively educate our kids.”
7. “Traffic analysis shows two standard travel lanes are necessary in order to create **adequate** capacity for motor vehicles given the boom in development of horizon.”
8. “The Apollo approach was **adequate** for several hours of EVA, so should not need too much tweaking.”
9. “What you have is **adequate**. You may want more of something, but you don’t need it.”
10. “Don't expect much deep low-end out of these diminutive speakers, but they're fine for listening to music while you work and they'll also be more than **adequate** for video chats.”

word	meaning
adequate	

APPENDIX D

PRE-TEST MEANING RECALL

Write the Turkish equivalents or English meanings of the words next to them.

(Kelimelerin Türkçe karşılıklarını veya İngilizce anlamlarını yanlarına yazınız.)

1. justify _____
2. interpret _____
3. reveal _____
4. impose _____
5. comply _____
6. convert _____
7. cooperate _____
8. violence _____
9. diversity _____
10. context _____
11. approach _____
12. currency _____
13. notion _____
14. conflict _____
15. outcome _____
16. concurrent _____
17. constant _____
18. inherent _____
19. behalf _____
20. distinct _____
21. adequate _____

22. prior _____

23. bond _____

24. inevitable _____

25. illustrate _____

26. annual _____

27. anticipate _____

28. compilation _____

29. investigate _____

30. derive _____

31. accompany _____

32. estimate _____

33. deny _____

34. consult _____

35. compensate _____

36. interaction _____

37. proportion _____

38. consent _____

39. access _____

40. fund _____

41. feature _____

42. reluctance _____

43. significant _____

44. domestic _____

45. distinct _____

46. forthcoming _____

47. preliminary _____

48. initial _____

49. trigger _____

50. complement _____

APPENDIX E

PRE-TEST FORM RECALL

Write the English equivalents of the words next to them. ***(Kelimelerin İngilizce karşılıklarını yazınız.)***

1. doğrulamak _____
2. yorumlamak _____
3. açığa çıkarmak _____
4. empoze etmek _____
5. itaat etmek _____
6. dönüştürmek _____
7. iş birliği yapmak _____
8. şiddet _____
9. çeşitlilik _____
10. bağlam _____
11. yaklaşım _____
12. döviz _____
13. fikir _____
14. çatışma _____
15. sonuç _____
16. kesişen _____
17. sürekli _____
18. doğasında olan _____
19. biri adına _____

20. farklı _____

21. yeterli _____

22. önceki _____

23. bağ _____

24. kaçınılmaz _____

25. örneklemek _____

26. yıllık _____

27. öngörmek _____

28. derleme _____

29. araştırmak _____

30. türetmek, sağlamak _____

31. eşlik etmek _____

32. tahmin etmek _____

33. inkar etmek _____

34. danışmak _____

35. telafi etmek _____

36. iletişim _____

37. orantı _____

38. izin, rıza _____

39. erişim _____

40. sermaye _____

41. özellik _____

42. isteksizlik _____

43. önemli _____

44. yerel _____

45. belirgin _____

46. yaklaşan _____

47. öncelikli _____

48. başlangıç _____

49. tetiklemek _____

50. tamamlayıcı _____

APPENDIX F

PRE-TEST MEANING RECOGNITION

Choose the correct meanings of the words from the options. ***(Seçeneklerden kelimenin doğru anlamını seçiniz.)***

1. justify
a. açığa çıkarmak
b. yorumlamak
c. doğrulamak

2. interpret
a. fikir
b. iletişim
c. yorumlamak

3. reveal
a. doğasında olan
b. açığa çıkarmak
c. tahmin etmek

4. impose
a. empoze etmek
b. özellik
c. yıllık

5. derive
a. türetmek, bir şeyden sağlamak
b. tamamlayan
c. eşlik etmek

6. inherent
a. izin, rıza
b. doğasında olan
c. yeterli

7. adequate
a. önceki
b. izin, rıza
c. yeterli

8. violence
a. yaklaşım
b. fikir
c. şiddet

9. diversity
a. orantı
b. yerel
c. çeşitlilik

10. context
a. bağlam
b. derleme
c. bağ

11. approach
a. tetiklemek
b. tamamlayan
c. yaklaşım

12. currency
a. başlangıç
b. öncelik
c. özellik

13. complement
a. tamamlayan
b. çatışma
c. telafi etmek

14. consent
a. belirgin
b. isteksizlik
c. izin, rıza

15. notion
a. kaçınılmaz
b. yerel
c. fikir

16. concurrent
a. araştırmak
b. orantı
c. kesişen

17. constant
a. sürekli
b. yerel
c. bağlam

18. bond
a. bağ
b. bağlam
c. özellik

19. inevitable
a. öngörmek
b. kaçınılmaz
c. yaklaşan

20. behalf
a. biri adına
b. çatışma
c. danışmak

21. illustrate
a. derleme
b. araştırmak
c. örneklemek

22. annual
a. yıllık
b. derleme
c. biri adına

23. anticipate
a. isteksizlik
b. öngörmek
c. itaat etmek

24. comply
a. telafi etmek
b. itaat etmek
c. çatışma

25. compilation
a. sürekli
b. sermaye
c. derleme

26. investigate
a. doğrulamak
b. araştırmak
c. dönüştürmek

27. convert
a. dönüştürmek
b. iş birliği yapmak
c. iletişim

28. cooperate
a. erişim
b. danışmak
c. iş birliği yapmak

29. compensate
a. telafi etmek
b. itaat etmek
c. iletişim

30. estimate
a. yorumlamak
b. tahmin etmek
c. yaklaşan

31. deny
a. empoze etmek
b. belirgin
c. inkar etmek

32. proportion
a. orantı
b. iletişim
c. erişim

33. feature
a. şiddet
b. özellik
c. belirgin

34. prior
a. doğasında olan
b. önceki
c. isteksizlik

35. distinct
a. sonuç
b. belirgin
c. isteksizlik

36. outcome
a. sonuç
b. çatışma
c. sermaye

37. feature
a. sonuç
b. isteksizlik
c. özellik

38. domestic
a. yeterli
b. sürekli
c. fikir

39. forthcoming
a. dönüştürmek
b. tetiklemek
c. yaklaşan

40. significant
a. önemli
b. biri adına
c. tamamlayan

41. preliminary
a. öncelikli
b. sürekli
c. kesişen

42. conflict
a. çatışma
b. erişim
c. danışmak

43. reluctance
a. doğasında olan
b. biri adına
c. isteksizlik

44. consult
a. eşlik etmek
b. danışmak
c. itaat etmek

45. interaction
a. erişim
b. iletişim
c. sermaye

46. initial
a. döviz
b. başlangıç
c. bağ

47. trigger
a. yorumlamak
b. açığa çıkarmak
c. tetiklemek

48. access
a. erişim
b. iletişim
c. izin, rıza

49. fund
a. türetmek, bir şeyden sağlamak
b. sermaye
c. sonuç

50. accompany
a. telafi etmek
b. dönüştürmek
c. eşlik etmek

APPENDIX G

POST-TEST MEANING RECALL

Write the Turkish equivalents or English meanings of the words next to them.

(Kelimelerin Türkçe karşılıklarını veya İngilizce anlamlarını yanlarına yazınız.)

1. derive _____
2. comply _____
3. cooperate _____
4. convert _____
5. compensate _____
6. prior _____
7. distinct _____
8. outcome _____
9. conflict _____
10. reluctance _____
11. consult _____
12. fund _____
13. access _____
14. accompany _____
15. interaction _____
16. inherent _____
17. complement _____
18. consent _____
19. behalf _____
20. adequate _____

APPENDIX H

POST-TEST FORM RECALL

Write the English equivalents of the words next to them. ***(Kelimelerin İngilizce karşılıklarını yazınız.)***

1. doğasında olan _____
2. yeterli _____
3. biri adına _____
4. tamamlayan _____
5. izin, rıza _____
6. iletişim _____
7. eşlik etmek _____
8. danışmak _____
9. sermaye _____
10. erişim _____
11. isteksizlik _____
12. çatışma _____
13. sonuç _____
14. belirgin _____
15. önceki _____
16. dönüştürmek _____
17. türetmek, sağlamak _____
18. işbirliği yapmak _____
19. itaat etmek _____
20. telafi etmek _____

APPENDIX I

POST-TEST MEANING RECOGNITION

Choose the correct meanings of the words from the options.
(Seçeneklerden kelimenin doğru anlamını seçiniz.)

1. derive
a. türetmek, bir şeyden sağlamak
b. tamamlayan
c. eşlik etmek

2. inherent
a. izin, rıza
b. doğasında olan
c. yeterli

3. adequate
a. önceki
b. izin, rıza
c. yeterli

4. complement
a. tamamlayan
b. çatışma
c. telafi etmek

5. consent
a. belirgin
b. isteksizlik
c. izin, rıza

6. behalf
a. biri adına
b. çatışma
c. danışmak

7. comply
a. telafi etmek
b. itaat etmek
c. çatışma

8. convert
a. dönüştürmek
b. iş birliği yapmak
c. iletişim

9. cooperate
a. erişim
b. danışmak
c. iş birliği yapmak

10. compensate
a. telafi etmek
b. itaat etmek
c. iletişim

11. prior
a. doğasında olan
b. önceki
c. isteksizlik

12. distinct
a. sonuç
b. belirgin
c. isteksizlik

13. outcome
a. sonuç
b. çatışma
c. sermaye

14. conflict
a. çatışma
b. erişim
c. danışmak

15. reluctance
a. doğasında olan
b. biri adına
c. isteksizlik

16. consult
a. eşlik etmek
b. danışmak
c. itaat etmek

17. fund
a. türetmek, bir şeyden sağlamak
b. sermaye
c. sonuç

18. access
a. erişim
b. iletişim
c. izin, rıza

19. accompany
a. telafi etmek
b. dönüştürmek
c. eşlik etmek

20. interaction
a. erişim
b. iletişim
c. sermaye

APPENDIX J

D-DDL THINK-ALOUD PROTOCOL TASK

Worksheet

1. *Go to COCA and MICASE*
2. *Search for the words*
3. *Use the concordances to guess the meanings of the words*
4. *DO NOT use your dictionaries or translate function of the corpora*
5. *You can write the meanings in Turkish or in English*

word	meaning
anticipate	
ignorance	
deny	
compilation	

APPENDIX K

I-DDL THINK-ALOUD PROTOCOL TASK

Worksheet

1. *There are 4 words with 10 example sentences for each of them*
2. *Read the example sentences taken from corpus*
3. *Guess the meanings of the words in green*
4. *You can write the meanings in Turkish or in English*

1. "When you know the game, you'll **anticipate** to make use of the options why not check it out."
2. "You can see he's athletic. We had to be a little bit creative with some of the plays we ran this week, but we certainly **anticipate** that he's going to run the football a little bit."
3. "They do not just rely on tradition; they try to **anticipate** the new needs of customers."
4. "On a residential mortgage you could **anticipate** to spend within the area of five per cent in interest, whereas acquire to let mortgages are most likely to be closer to 6 per cent."
5. "It's impossible to **anticipate** everything that could go wrong, so it pays to be able to improvise a solution using the skills and supplies at hand."
6. "I **anticipate** that this kind of blog post can generate some hate mail, so I will state in advance that if someone wants me to be sensitive to Union concerns ever again."
7. "This is tricky. We have dead Americans and a failure to **anticipate** a terror attack on the anniversary of 9/11."
8. "However, I don't **anticipate** the outcome being much different against the porous defense they have."
9. "Although he didn't specify the date, we can have a reasonable basis to **anticipate** when these future events will take place."
10. "It makes perfect sense that the more I know about each species the better my chances are for creating wonderful images of the birds because I can **anticipate** what they might do next."

word	meaning
anticipate	

1. “Sadly **ignorance** is stronger than knowledge, **ignorance** acts without ever stopping to think.”
2. “Barack Obama will finally be retired and when his **ignorance** of economics will no longer plague our homeland.”
3. “It’s been corrupted as a result of the **ignorance** of the population. We have no one but ourselves to blame.”
4. “I will always have a kind of **ignorance** towards the subject as it is unfamiliar to me.”
5. “There is really no reason to believe that there is anything about the universe that we as parts of that universe can not understand given the time and the requisite advances in knowledge and technology. Current **ignorance** is not necessarily permanent **ignorance**, and there is reason to be optimistic given our past history.”
6. “Our online activity gives us increased exposure to different types of people, leading to a better understanding of one another, and decreasing the amount of **ignorance** and racism in the world.”
7. “I can understand **ignorance** but not stupidity -- and to refuse to back down in the face of the truth is well stupid.”
8. “They are not bending it with malice of intent but because they are ignorant of the details. **Ignorance** is not a bad thing if you know you are ignorant. Boy that line sounds awful glad I'm not running for anything. **Ignorance** can be remedied by teaching.”
9. “I will say that shaming people for **ignorance** has to be treated as intolerable. ...without shaming people who don't know better than to invoke that sort of shame.”
10. “It’s about people dying from **ignorance** when other knowledge was available in their own contemporary societies.”

word	meaning
ignorance	

1. “The sacrifice that we must all do is **deny** women equalityand give men a lower position in rulership. Men must bend the knee to women andelevate them to our ultimate sovereign.”
2. “I agree with you Brandon. I also consider myself a fan of the series, but being so doesn't mean that I have to **deny** the fact that the games are not what they used to.”
3. “We can not **deny** a right to homosexuals to marry.”
4. “Neither Mack nor Biancuzzo was present to confirm or **deny** these claims.”
5. “There have been disasters in North America, with hurricanes and floods, yet still people **deny** and say' oh, it has nothing to do with climate change.' It visibly has got something to do with climate change. " # But some U.S. politicians found it easier to **deny** the science on climate change than take action.”
6. “They still **deny** existence of Israel and they are hallucinating.”
7. “You don't have to do it all! Don't be afraid to **deny** a request, whether it's coming from your children, spouse, family friends, work or someone else.”
8. “They could choose to be sophisticated, politically “with it” people and **deny** their Jewish roots and connections altogether.”
9. “I can’t **deny** it but I love this woman and every thing she does.”
10. “Adoption was my first choice for becoming a mom; I don't **deny** that the paperwork and finances were stressful, but the long wait was so absolutely worth it.”

word	meaning
deny	

1. “A **compilation** of video clips shows Rob admitting how happy he is that' The Twilight Saga' has finally come to a close.”
2. “It was a double feature that functioned as a **compilation** of the twelve episode series of the same name.”
3. “The first Book is a **compilation** of 3 stories and the second one is one story.”
4. “But if you're trying to make a **compilation** of other people's work, or revise some previously copyrighted work, you should probably consult with an attorney.”
5. “Black October records will soon be releasing a **compilation** of selected songs.”
6. “This blog contains a **compilation** of recent articles--mostly political and local theatre reviews.”
7. “The Great Yearning is not a how-to but a how-done, a **compilation** of letters, blog posts and journal entries.”
8. “Bosman, Great **compilation** of photos. It is America’s loss that we will all suffer the consequences.”
9. “The enthusiasm and freshness he brings to his writing are fully on display in this **compilation** of some of his best recent work.”
10. “The **compilation** collects all the administrative regulations that were promulgated or approved by the State Council.”

word	meaning
comply	

APPENDIX L

D-DDL FOCUS GROUP INTERVIEW QUESTIONS

1. How do you compare learning vocabulary using online corpora and learning vocabulary with traditional activities such as matching with definitions or looking up their meanings on dictionaries?
2. How did learning words using online corpus to guess word meanings affect your vocabulary learning process? Can you talk about the positive and negative effects?
3. What were some of the problems you encountered while learning vocabulary from the online corpora? How did you solve these problems?
4. Which one was more effective in your opinion during these vocabulary studies: working individually or working in pairs Why? What kind of dialogues took place between you and your pair during pair work?
5. Have you ever used COCA or MICASE at home to learn vocabulary? Do you plan to use online corpus for your next word studies? Why?

APPENDIX M

I-DDL FOCUS GROUP INTERVIEW QUESTIONS

1. How do you compare learning vocabulary using concordances from corpora and learning vocabulary with traditional activities such as matching with definitions or looking up their meanings on dictionaries?
2. How did learning words using corpus data to guess word meanings affect your vocabulary learning process? Can you talk about the positive and negative effects?
3. What were some of the problems you encountered while learning vocabulary from corpus data? How did you solve these problems?
4. Which one was more effective in your opinion during these vocabulary studies: working individually or working in pairs Why? What kind of dialogues took place between you and your pair during pair work?
5. Would you like to continue making inferences using corpus data for your vocabulary learning in the future? Why?

APPENDIX N

PARTICIPANT INFORMATION AND CONSENT FORMS

CONSENT FORM FOR D-DDL GROUP

The institution supporting the research: Boğaziçi University
The name of the research: Study on Vocabulary Learning Process of EFL (English as a Foreign Language) Learners
Project Manager: Doç Dr.
Senem Yıldız
E-mail address:
Phone:
The name of the researcher: Dilay Nur Candan
E-mail address:
Phone:

Dear
Participant,

This study aims to examine the vocabulary learning processes of adult learners of English as a foreign language. Within the scope of the study, vocabulary learning sessions of approximately 45 minutes will be held within the course for 3 weeks, once a week. In these sessions, you will be asked to complete 5 English vocabulary learning activities by researching words from the online corpus. These sessions will be held as part of the lesson during class hours. A pre-test will be prepared to measure the vocabulary of the participants one week before the start of the sessions, a post-test and a delayed post-test will be administered in the weeks following the 3-week session. The aforementioned tests will only be applied within the scope of this study and will not affect your course grade or the assessment and evaluation activities to be implemented within the scope of the curriculum under any circumstances. The next week after the 3-week session, individual Zoom meetings will be held with Dilay Nur Candan, using the think-aloud method on your vocabulary learning. In these meetings, you will be asked to complete 5 exercises by sharing the screen and using the online corpus on the screen. Any suitable time outside the classroom will be determined for these Zoom meetings, and student screen recording and audio recording will be taken during these sessions. In the last stage, short semi-structured group interviews will be conducted with the participants who agree to participate.. Audio recordings of these interviews will be taken so that they can be analyzed later. All phases of the study will be conducted by Dilay Nur Candan, who is responsible for lecturing your class.
No fee or reward is offered for participation in the study. Participation is completely voluntary. There will not be any negative effects of your non-participation in the study. At any stage of the study, you can notify the researcher Dilay Nur Candan that you no longer want to be involved in the research without giving a reason, through

any communication channel or face to face. If you refuse to participate, all data collected from you so far will be destroyed and will not be used in the study. The data stored in the digital environment will be permanently deleted, and the printed documents will be destroyed by the shredder. There will be absolutely no negative effects (lecture grades, etc.) on you if you refuse to participate in the study.
This research is carried out for a scientific purpose and the confidentiality of participant information is crucial. All data collected from you during the study process, including the scores you have obtained in the exams to be applied and your names, will be kept strictly confidential. Access to this information will be open only to the researcher and the project manager. If more specific reference is required to the data collected within the scope of the study, number codes will be used.
If you have any questions about the study or request additional information, you can contact researcher Dilay Nur Candan or project coordinator Doç. Dr. Senem Yıldız using the contact information above. In addition, you can contact Boğaziçi University Social Sciences Master's and Doctorate Thesis Ethics Review Committee about your rights related to the study at the e-mail address.
By participating in this study, you can contribute to second language learning activities. The findings thanks to you will inform researchers, teachers and other foreign language learners about the vocabulary learning processes of English as a second language learners.
Consent:

I, (the name of the participant)..... , have read the text above. I fully understood the scope and purpose of the study I was asked to participate in, and my responsibilities as a volunteer. I had the opportunity to ask questions about the study. I understood that I could leave this study whenever I wanted and without having to give any reason, and that I would not face any negative consequences if I leave.
In these conditions, I agree to participate in the research voluntarily, without any pressure.

- ☐ I accept that I am audio-recorded if I am invited for an interview.
- ☐ I accept that I am video-recorded if I am invited for a Zoom meeting.
- ☐ I accept that I am audio-recorded if I am invited for a Zoom meeting.

I *received / do not want to receive* a sample of the form.
Name-Surname of the Participant:
.....

Signature: .....

Phone: .....

E-mail: .....

Date (day/month/year): ...../...../.....

Name-Surname of the Researcher: .....

Signature: .....

CONSENT FORM FOR I-DDL GROUP

The name of the research: Study on Vocabulary Learning Process of EFL (English as a Foreign Language) Learners

Project Manager: Doç. Dr.
Senem Yıldız
E-mail address:
Phone:
The name of the researcher: Dilay Nur Candan
E-mail address:
Phone:

Dear
Participant,

This study aims to examine the vocabulary learning processes of adult learners of English as a foreign language. Within the scope of the study, an estimated 30-minute vocabulary learning sessions will be held once a week for 3 weeks. These sessions will be held as part of the lesson during class hours. A pre-test will-be prepared to measure the vocabulary of the participants will be administered one week before the start of the sessions, a post-test and a delayed post-test will be administered in the weeks following the 3-week session. The aforementioned tests will only be applied within the scope of this study and will not affect your course grade or the assessment and evaluation activities to be implemented within the scope of the curriculum under any circumstances. In the week following the 3-week session, individual Zoom meetings will be held with Dilay Nur Candan, again using the voluntary thinking aloud method. In these meetings, you will be asked to complete 5 exercises given on the Word document on the screen while sharing the screen. Any suitable time outside the class hours will be determined for these Zoom meetings, and student screen recording and audio recording will be taken during these sessions. In the last stage, short-term semi-structured group interviews will be conducted with the participants who agree to participate. Audio recordings of these interviews will be taken so that they can be analyzed later. All phases of the study will be conducted by Dilay Nur Candan, who is responsible for lecturing your class.

No fee or reward is offered for participation in the study. Participation is completely voluntary. There will not be any negative effects of your non-participation in the study. At any stage of the study, you can notify the researcher Dilay Nur Candan that you no longer want to be involved in the research without giving a reason, through any communication channel or face to face. If you refuse to participate, all data collected from you so far will be destroyed and will not be used in the study. The data stored in the digital environment will be permanently deleted, and the printed documents will be destroyed by the shredder. There will be absolutely no negative effects (lecture grades, etc.) on you if you refuse to participate in the study.

This research is carried out for a scientific purpose and the confidentiality of participant information is crucial. All data collected from you during the study

process, including the scores you have obtained in the exams to be applied and your names, will be kept strictly confidential. Access to this information will be open only to the researcher and the project manager. If more specific reference is required to the data collected within the scope of the study, number codes will be used.
If you have any questions about the study or request additional information, you can contact researcher Dilay Nur Gadan or project coordinator Doç.Dr. Senem Yıldız using the contact information above. In addition, you can contact Boğaziçi University Social and Human Sciences Master's and Doctorate Thesis Ethics Review Committee about your rights related to the study at the e-mail address.
By participating in this study, you can contribute to second language learning activities. The findings thanks to you will inform researchers, teachers and other foreign language learners about the vocabulary learning processes of English as a second language learners.

Consent:

I, (the name of the participant)..... , have read the text above and
I fully understood the scope and purpose of the study I was asked to participate in, and my responsibilities as a volunteer. I had the opportunity to ask questions about the study. I understood that I could leave this study whenever I wanted and without having to give any reason, and that I would not face any negative consequences if I leave.

In these conditions, I agree to participate in the research voluntarily, without any pressure.

- ☐ I accept that I am audio-recorded if I am invited for an interview.
- ☐ I accept that I am video-recorded if I am invited for a Zoom meeting.
- ☐ I accept that I am audio-recorded if I am invited for a Zoom meeting.

I *received / do not want to receive* a sample of the form.

Name-Surname of the Participant:
.....

Signature: .....

Phone: .....

E-mail: .....

Date (day/month/year): ...../...../.....

Name-Surname of the Researcher: .....

Signature: .....

APPENDIX O

ETHICS COMMITTEE APPROVAL

Evrak Tarih ve Sayısı: 01.11.2021-36422

T.C.
BOĞAZİÇİ ÜNİVERSİTESİ
SOSYAL VE BEŞERİ BİLİMLER YÜKSEK LİSANS VE DOKTORA TEZLERİ ETİK İNCELEME KOMİSYONU
TOPLANTI KARAR TUTANAĞI

Toplantı Sayısı	:	22
Toplantı Tarihi	:	13.10.2021
Toplantı Saati	:	14:00
Toplantı Yeri	:	Zoom Sanal Toplantı
Bulunanlar	:	: Prof. Dr. Ebru Kaya, Prof. Dr. Fatma Nevra Seggie, Dr. Öğr. Üyesi Yasemin Sohtorik İlkmen
Bulunmayanlar	:	

Dilay Nur Tezgül
Yabancı Diller Eğitimi Bölümü

Sayın Araştırmacı,

"The Comparative Effect of Direct and Indirect Approaches to DDL on Constructing Vocabulary Knowledge" başlıklı projeniz ile ilgili olarak yaptığınız SBB-EAK 2021/58 sayılı başvuru komisyonumuz tarafından 13 Ekim 2021 tarihli toplantıda incelenmiş ve uygun bulunmuştur.

Bu karar tüm üyelerin toplantıya çevrimiçi olarak katılımı ve oybirliği ile alınmıştır. COVID-19 önlemleri kapsamında kurul üyelerinden ıslak imza alınamadığı için bu onay mektubu üye ve raportör olarak Fatma Nevra Seggie tarafından bütün üyeler adına e-imzalanmıştır.

Saygılarımızla, bilgilerinizi rica ederiz.

Prof. Dr. Fatma Nevra SEGGIE
ÜYE

e-imzalıdır
Prof. Dr.Fatma Nevra SEGGIE
Raportör

SOBETİK 22 13.10.2021

APPENDIX P

SAMPLE TRANSCRIPTION OF THINK-ALOUD PROTOCOL DATA

(D02 writes the target word "anticipate" on the search bar in COCA and clicks on search button. COCA gives a "wait time")

D02: Hmm. I think I should wait a little bit now *(waits a little bit).* Or let me refresh my page. *(refreshes the webpage, writes the word again and clicks on search button)*

D02: *(Moves his house on the frequency information)* Oh! This word is a frequent one. Let me see what it means.

(Clicks on the word to reach concordance lines. Scans concordance lines and skims 4 of them.)

D02: *(Selects one of the concordance lines)* This sentence looks like it has less unfamiliar words.

(Views wider context and reads starting from one sentence before and ending at one sentence after the sentence that includes the target word. Rereads sentences and sounds out the target word three times)

D02: There are many words here that I do not know. I could not hypothesize any meaning here. Let me check another one.

(Returns to the other concordance lines. Scans concordance lines and skims 3 of them).

D02: *(Selects one of the concordance lines, views wider context, and starts reading the sentence before the one that includes the target word).* We don't currently anticipate. *(Reads this line out lout twice).* Now, I have some idea about its meaning but I am not sure. Let me check another one.

(Scans the concordance lines and their registers)

D02: I will check the websites with the ending ".blog" or ".com" because the language in these websites is simpler than the one in the websites ending with ".org", I believe. For instance, this one. *(Views wider context)* When I look at the paragraph, I see that the (target) word is repeated three times in the paragraph. This is good. It is easier to guess the meaning,I believe.

(Reads the three sentences that includes the target word)

D02: Here, I understand that "anticipate" means "to predict", but I need to check another sentence to be sure.

(Returns to the main page to select another concordance line. Scans and skims 2 sentences and selects one of them. Views wider context and reads the sentence that includes the target word)

D02: Here, I am sure that it means "to predict", because it is written "It is impossible to anticipate everything that could go wrong.". So, there is the word "impossible" and it means you cannot predict everything. I mean, the word "anticipate" means "to predict".

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