

**REPUBLIC OF TURKEY
ÇUKUROVA UNIVERSITY
THE INSTITUTE OF SOCIAL SCIENCES
DEPARTMENT OF ENGLISH LANGUAGE TEACHING**

**USING SEMANTIC MAPPING STRATEGY FOR TEACHING CONTENT
WORDS PRACTICE IN EFL CONTEXT**

Mehmet ALTAY

PhD. DISSERTATION

ADANA / 2015

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ADANA / 2015

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bildirir, aksi bir durumda aleyhime doğabilecek tüm hak kayıplarını kabullendiğimi beyan ederim. 02 /06 / 2015

Mehmet ALTAY

ÖZET

İNGİLİZCE'NİN YABANCI DİL OLARAK ÖĞRETİMİNDE İÇERİK SÖZCÜKLERİNİN ÖĞRETİLMESİNDE ANLAMSAAL PLANLAMA STRATEJİSİNİN UYGULANMASI

Mehmet ALTAY

Doktora Tezi, İngiliz Dili Eğitimi Anabilim Dalı

Danışman: Doç. Dr. Jülide İNÖZÜ

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Bu çalışma, deneysel ve betimsel olmak üzere iki aşamadan oluşmaktadır. Öncelikli amaç ise bir kelime öğrenme stratejisi olarak kelimelerin anlambilimsel ilişkilerinin haritalandırılmasına yönelik farkındalığın arttırılmasıdır. Yabancı dil olarak İngilizce öğrenenlerin bireysel ve sosyal deneyimleri, sözcüksel şemanın haznelere, bağlantılı bilgileri temin etmekte kullanılmıştır.

Deneysel aşama, ana olarak kelimelerin anlambilimsel ilişkilerinin haritalandırılmasının, akademik ortamda yabancı dil olarak İngilizce öğrenimine olan katkısının kapsamına dayanmaktadır. İngilizce'yi yabancı dil olarak öğrenen 20 öğrenci, deney aşamasına katılmıştır. İlk aşamada bireysel bir çalışma, ardından da toplu bir sınıf etkinliğine katılmaları istenmiştir. Bireysel çalışma esnasında her bir öğrenci, kendi yaşantılarından edindikleri bilgilerine dayalı bir öğrenci sözlüğü oluşturmuştur. Ortaklaşa olan çalışmada ise bu bireysel veriler derlenmiş ve internet üzerinde bir veritabanına aktarılmıştır.

Ne var ki hiçbir strateji, dil sınıflarındaki ihtiyaçlarının tamamını tek başına karşılayabilecek yeterlilikte değildir. Bu sebeple, diğer takviye stratejilerin, anlambilimsel haritalandırmaya olan etkilerini gözlemlene de bu çalışmanın bir diğer amacı olmuştur. Bir başka nokta da, bu uygulamanın nihayetinde öğrenilen kelimelerin yanı sıra, bilinen kelimelerin kapasitesinde bir artış olup olmadığının araştırılması şeklindedir. İstatistikî verilere dayanarak, öntest ve sontest karşılaştırmaları hem öğrenilen kelimelere dair, hem de bilinen kelimelere dair anlamlı bir fark elde edildiği görülmektedir. Ayrıca, takviye stratejilerin anlambilimsel haritalandırma çalışması üzerinde kaydedeğer bir farklılık yaratmadığı ortaya çıkmıştır.

Betimsel aşamada ise deney katılımcılarından, çalışmaya dair dönütleri istenmiştir. Bu doğrultuda dönem sonunda, dört sorudan oluşan ve de internet üzerinden kendilerine sunulan bir anketi yanıtlamaları istenmiştir. Elde edilen dönütler, nicel veri yorumlamasında kullanılan bir yazılım olan NVivo10'da analiz edilmiştir. Her iki aşamadan elde edilen bulgular, bir kelime öğrenme stratejisi olarak sözcüklerin anlambilimsel ilişkilerinin haritalandırılmasının faydalılığı hususunda örtüşmektedir.

Anahtar kelimeler: Anlambilimsel haritalandırma, şema, sözcüklerin anlambilimsel ilişkileri, kelime öğrenme stratejileri, kelime dağarcığı.

ABSTRACT

USING SEMANTIC MAPPING STRATEGY FOR TEACHING CONTENT WORDS PRACTICE IN EFL CONTEXT

Mehmet ALTAY

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The current study consists of two phases as experimental and descriptive. The primary aim hereby is to raise awareness towards lexical semantic relations (LSRs) through semantic mapping as a vocabulary learning strategy. EFL learners' individual and social experiences are intended to provide the necessary knowledge to fill the slots in their lexical schemata.

The experimental phase mainly concerned with the extent of the mapping of LSRs in terms of its contribution to the vocabulary learning in an academic EFL context. 20 EFL students participated in the treatment procedure. They were asked to follow an individual path first, and a collaborative one in the classroom next. During the individual study, each student composed a personal learner's dictionary based on their real world knowledge. The collaborative part was in terms of compiling such individual data and accumulating them on a web database.

Still, no single strategy is enough to meet the whole needs in a language classroom. Therefore, investigating the influence of the other supplementary strategies over semantic mapping was another purpose of the study. A further point that the study also sought was on any change in the size of the vocabulary known as well as the vocabulary learned after the practice.

The statistical results indicated a significant difference between the pre-test and post-test scores of the treatment group for both the vocabulary learned and known. Besides, there seemed to be no remarkable difference between the impacts of the other supplementary strategies on the process. The participants of the treatment were asked to provide feedback in the descriptive phase. They were directed four survey items online after the end of the semester. The data obtained from the responses were analysed using

NVivo10, software to interpret qualitative data. A correspondence between the findings of both phases was evident towards the use of mapping of LSRs as a vocabulary learning strategy.

Keywords: Semantic mapping, schemata, lexical semantic relations, vocabulary learning strategies, vocabulary size.

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“Natura nihil frustra facit”

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LIST OF ABBREVIATIONS

ANOVA	: Analysis of Variance
BNC	: British National Corpus
CEFR	: Common European Framework of Reference
CEM	: Complex Episodic Memories
COCA	: Corpus of Contemporary American English
COG	: Cognitive Strategies
DET	: Determination Strategies
EFL	: English as a Foreign Language
ELT	: English Language Teaching
EE	: Episodic Elements
FCE	: First Certificate in English
FLT	: Fulbright Foreign Language Teaching
fMRI	: Functional Magnetic Resonance Imaging
IQ	: Intelligence Quotient
L1	: First Language
L2	: Second Language
LSRs:	: Lexical Semantic Relations
LTM	: Long-term Memory
MELDs	: Monolingual English Language Dictionaries
MEM	: Memory Strategies
MET	: Metacognitive Strategies
PRS	: Procedural or Perceptual Representation
RIF	: Retrieval-induced Forgetting
SEM	: Simple Episodic Memories
SM	: Sensory Memory
SOC	: Social Strategies
STM	: Short-term Memory
UG	: Universal Grammar
VLS	: Vocabulary Learning Strategies
VTs	: Vocabulary Teaching Strategies
WM	: Working Memory

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CHAPTER I

INTRODUCTION

1.1. Introduction

The language phenomenon has certain demarcations. They may appear in the form of rational reasons. Is it ever sensible, for instance, to learn the grammar of a language without knowing at least some of the words from its lexicon? Or how come many curriculum vitae profess that their correspondents are proficient in a certain language, if not several, to a favorable extent even though all they know is limited with either a couple of words or phrases? The limitations may also manifest its entity in an empiricist form using positive evidence such as neurolinguistic findings of separate processing paths for different types of lexical entries in a human language lexicon (Müller, 2010, p. 351).

In either way, the role of vocabulary learning is a *sine qua non* of language education. That is to say, it is a must to learn a finite set of lexemes in any natural human language to be grasped, and thus meaning making can be possible. Foreign language learners are usually aware of this boundary and they concern it in particular. Learning new words is, from a constructivist approach, enhancing students' repertoire through new schemata in mind. On the basis of this theory, there should be a correlation between having a large-scale, long-term vocabulary growth and the acquisition of new schemata, or restructuring existing ones (Anderson, William, & Patricia, 1987, p. 266).

With its undeniable prominence in hand, much of the research into the area of language strategies dealt indirectly with strategies specifically applicable to vocabulary learning (Schmitt, 1997). Besides, not all these strategies are aimed to utilize the means of schema. Semantic maps, as being one of the most pertinent strategies in this sense, seem not to be among the most frequently used vocabulary learning strategies though. This paradox might well be associated with the nature of the relations covered in these maps. Some related studies in this sense handled analogical, functional, and mechanical representations in nature (Dagher and Cossman, 1990), some others benefitted from word walls, which are basically on interactive visual means (Jackson, Tripp, and Cox, 2011), still others included a wide variety of categories rather than focusing on certain points; from pronunciation considerations to cultural issues (Williams, 1994). Whereas,

lexical semantic relations (henceforth referred simply to as LSRs) and other sense relationships (hyponymy and meronymy) can help consolidate vocabulary through being illustrated with semantic maps (Oxford, 1990). Then a significant issue to be considered lies behind how to map these relations in vocabulary instruction.

1.2. Background of the Study

How we, humans, associate concepts with their referents has always been among the most speculated issues of cognitive psychology. The roots of today's understanding of this relatedness dates back to a theory in the 18th century. As for Kant (1781, p. 92), the conception of a dog indicates a rule, according to which one's imagination can delineate the figure of a four-footed animal in general, without being limited to any particular individual form which experience presents. He coined the term "schematism" for the arrangement of concepts in human cognitive system.

One of the most influential reflections of this ideology was on educational research. Bartlett (1932, p. 201) was the first to utilize "schemata". He defined a schema as an active organization of past reactions, or of past experiences, which must always be supposed to be operating in any well-adapted organic response. Similarly, Anderson, Spiro and Anderson (1977, p. 2) referred to the mental structures that incorporate general knowledge as schemata. They may also make it easy to search memory in that culturally appropriate ones may provide the ideational scaffolding through which learning information is practical (Anderson et al., 1984, p. 249)

When the issue is language and its instruction, the identification of the constituents of these mental webs is crucial. "Principle of compositionality" may stand for the illustration of this instance. As defined in Moro (2008), the meaning of a sentence results from combining the meanings of its parts. Therefore, words are of vital importance for meaning making. Once the lexical items, which bear certain semantic representations, are removed from a sentence, the remaining properties are nothing but the rules of composition. As an instance, it is evident that there is a relation between "Paganini" and "composer" in the sentence "Paganini was a composer". Then noticing such relations, especially among content words, should have significance not less than mastering the grammar of the target language. Still, these LSRs may alter depending on word senses. They are the general meanings of words as considered separately from

their specific reference on any given occasion of use, which are of high importance for the identification of concepts (Riemer, 2010, p. 32).

Content words are discrete in that these concepts bear lexical properties. For example, the concept of a bird does not itself fly nor have wings, though a bird does and the concept's properties are designed to fit those of the bird (Hudson, 2010). From a constructivist point of view, these properties are tied in terms of mental schemata. To interpret a particular situation in terms of a schema is to match the elements in the situation with the generic characterizations in the schematic knowledge structure (Anderson et al., 1978, 434). Providing opportunities to enhance learners' repertoire through new schemata is quite essential for a desirable vocabulary growth. Basic patterns of repeated experience give rise to the conceptual categories for this very reason (Riemer, 2010). Therefore, practice over these elements, which occupy semantic slots in cognitive schemata, can better be through the reinforcement of their nodes, or LSRs.

Pedagogically speaking, these relations constitute an important facet of cognitive semantics, and thus of language education. Much of the related research is towards their impact over L1 acquisition, whereas they seem to be neglected in L2 instruction. Learners of English as a foreign language are typical examples for this case. Although they should be motivated to utilize vocabulary learning strategies which emphasize the role of LSRs, the strategies in this vein are often among the least applied ones. At this point, a well-organized semantic mapping strategy may meet the lexical semantic needs of the learners with the assistance of certain other compatible strategies.

1.3. Statement of the Problem

The problem which the current study aims to deal with relates to EFL learners at the School of Foreign Languages at University of Gaziantep. Based on not only diverse means of assessment and evaluation but also the practical experience of several years at this educational context, it can obviously be said that vocabulary education still remains to be far from being fruitful. Initial studies using Nation's Vocabulary Size Test indicate that undergraduate non-native speakers of non-European backgrounds successfully coping with studying at an English speaking university have a vocabulary size around 5,000-6,000 word families (Nation, 2012). Despite meeting the suggested size in pre-test conduction, the participants from the target population remain to have unease at the

vocabulary sections of their academic exams. They often declare that the most problematic section of their exams are towards vocabulary. Parallel to their claim, the exam results also make this problem evident. Furthermore, the problem often continues during their freshman education.

Apropos this issue, there might be some underlying causes in terms of transforming knowledge into intake. It is not uncommon to hear many students regretting their failure in the vocabulary sections in their exams despite knowing the meaning of the target words. However, the vocabulary learning strategies applied by the learners are usually a very limited number of discovery strategies. Students often claim that they knew the meanings of all the words that they learned but could not employ them in relevant context. As asked what they knew about a certain word, the infallible response is either a definition or a translation; in short, the descriptive components of language. Very few come up with an idea on troubleshooting but keep traditional strategies. In other words, the vocabulary learning strategies used at the school is nothing but frequently stereotypical, which means they are free from raising awareness. Besides, several of these strategies depend on teacher as controller rather than facilitator, and students do not have an active participation.

Furthermore, there is a lack of guidance to relate new words to already existing relevant schemata. Despite the broad and often flexible nature of vocabulary, semantic relatedness of words is mostly based on lexicographical resources such as dictionaries. Social and individual experiences, or idiosyncratic mental representations (Murphy, 2003) are not attributed enough with this regard. Although it may be a demanding labor in an EFL classroom setting, relating new words into their semantic counterparts based on learner-based experience should be of high importance when compared to its contribution to EFL learners. Since intake is preceded by input, how comprehensive an input practice is conducted raises in value. Theoretically, LSRs are default elements of schemata to be modified or rearranged depending on variation in schemata. Semantic mapping can supply the template to analyze these relations. Be that as it may, practice of such semantically related lexical properties that way is not much frequent in accordance with the related literature (Schmitt, 1997). The contradiction between the less frequent usage of semantic maps and the potential that they offer might result from how they are conducted.

A final remark to be handled is towards the supplementary strategies. No strategy is solely enough to cover all pedagogical requirements. Once a learning

strategy is adopted, it is often regarded as the only panacea to every circumstance even though it is evident that it is not the case. Semantic mapping is not different in this sense and should be assisted with other strategies, and the impact of these strategies over mapping is a matter of concern to be analyzed.

1.4. Aim and Research Questions

The primary aim of this study is to raise awareness towards LSRs through semantic mapping as a vocabulary learning strategy. While doing so, it is highly intended to use EFL students' individual experiences; that is, their already existing schemata rather than other extensive pedagogical materials as much as possible. The logic behind it is, therefore, to stimulate self-efficacy in a way. Learner-based relations are essential in that they compose the web of mental concepts for a large-scale, long-term vocabulary growth.

In order for such a growth to take place, learners need steady input which will further be intake through repeated practice. Enhancing the strategies for vocabulary learning may also influence the size of the vocabulary known. The current vocabulary learning strategy of semantic mapping is designed to provide the basis of such input modification through LSRs.

As previously stated, no single strategy can be regarded as a panacea for the whole instructional needs and is generally supported with other strategies. Therefore, another aim of this study is to observe the impact of other vocabulary learning strategies over semantic mapping using supplementary strategies. Although the strategy does not take its part among the most commonly used strategies, there seems to be an underrated potential of word relations. A well-designed semantic mapping strategy may offer more and make difference hence.

Considering the aims highlighted above, the following research questions are the focal concerns of this study:

1. To what extent can the mapping of LSRs contribute to the vocabulary learning in an academic EFL context?
2. Do other supplementary vocabulary strategies have a significant influence over mapping of LSRs?

3. If yes, to what extent is the mapping of LSRs influenced by other selected supplementary strategies in terms of:

- 3. a. Determination Strategies as Discovery Strategies,
- 3. b. Social Strategies as Discovery Strategies,
- 3. c. Social Strategies as Consolidation Strategies,
- 3. d. Cognitive Strategies as Consolidation Strategies, and
- 3. e. Metacognitive Strategies as Consolidation Strategies?

4. Is there a significant difference between the sizes of the vocabulary known by EFL learners who received a treatment on the mapping of LSRs than those of other EFL learners?

5. What is the direction of the EFL learners' overall attitude towards the mapping of LSRs?

The first four items stand for the experimental phase while the last is on the descriptive phase of the study.

1.5. Significance of the Study

The primary contribution of this study could be regarded as its emphasis on the pedagogical significance of semantic mapping in foreign language learning context. Despite prevalent inquiry to grasp the details related to its nature in theoretical linguistics, the practice of LSRs has not been one of the hot potatoes in applied linguistics. The focus of the former investigations was mainly on its identification or taxonomic classification, whereas this current study attempts to provide guidance for those who aim to get optimum benefit from semantic mapping in foreign language education.

Another significance of this study may be for the professionals of lexicography. Since a large proportion of their resources is foreign language learners, this current study can also be regarded as an attempt to enrich word entries through including vocabulary learning strategies as well as schematic networks. The individual learner dictionaries and their online database composed during this study serves as sample learner corpora to be considered for the future of learner-centered resources.

1.6. Assumptions and Limitations

The foremost assumption relates to the socio-economic and socio-cultural backgrounds of the non-native speaker groups in this study. The University of Gaziantep locates in a cosmopolitan metropolis of Turkey and the individuals of the accessible population represent a wide variety of social layers. The non-native participants also include a slight number of international students from other Middle Eastern and Asian countries. Due to the limited sampling, the results of this study may not necessarily indicate to an overall picture, and thus be universally generalized.

A second assumption concerns the language proficiency levels of the non-native participants. Since the students in this school take the same sit-down proficiency exam at the very beginning of the semester, they are placed into the same level groups. Hence, they are assumed to be of the same proficiency level.

The third participant group, namely the native control group, was not subject to the tests which were conducted in order to measure the sizes of the vocabulary known by the other participants. The logic behind not including them is that they are already native speakers of English from academic context. In fact, this test is said to be applicable to native speakers as well. On the other hand, Nation (2012) comments just on the calculation rule for young native speakers, which can be interpreted as a redundancy for this study. Also, the sizes of the vocabulary known by native speakers have been investigated by him before, which eliminates a need to measure them again.

The awareness tests conducted to measure the vocabulary learned by the non-native speaker groups is limited with the words from their main coursebooks. A word list was already provided by the multimedia software of this coursebook. It was also released online at the beginning of the semester on the website of the school.

A final respect to be assumed is that the statistical data obtained from NVivo10 is used merely to categorize the qualitative indications with the ease of concrete basis. Otherwise, they should not be regarded as quantitative data. These measures are considered to reflect the qualitative feedback supplied by the participants of the treatment group.

1.7. Operational Definitions and Key Terms

Lexical Semantic Relations (LSRs): The relations defined by semantic paradigms which are at word level rather than phrasal or sentential level. They are also

known as *lexical relations*, or *semantic relations*, and are considered as a matter of language users' idiosyncratic mental representations (and processes involving them) more of an analytic and objective truth (Murphy, 2003, p. 5).

Mental Lexicon: It is a person's mental store of words, their meanings and associations (Richards and Schmidt, 2002, p. 327). Mental lexicon is often called as *mental dictionary* as well. New concepts that are given lexical form become part of the lexicon of a language and the process of establishing a new unit in any specific lexicon is commonly referred to as lexicalization (Bakken, 2006, p. 106).

Semantic Mapping: It is a classroom technique which is occasionally used as a vocabulary learning strategy. It aims to represent sound–meaning correspondences (Auwera and Temürcü, 2006, p. 131). A visual representation of ideas in a text or a conceptual relationship is used to assist usually with the reading of a text. Such a mapping can be generated by teachers or students (Richards and Schmidt, 2002).

Word Senses: A sense is one of the meanings that a particular word can have (Leech et al., 1997, p. 841). Determination of sense relation requires idiosyncrasy of lexicalization. What normally happens while selecting the appropriate sense of a word in a certain context is on purely pragmatic grounds (Quirk et al., 1987, 1528).

Synsets: A synset often refers to a cognitive synonym (Fellbaum, 1998) and can be regarded as the generic terms of LSRs. Super-subordinate relation, or *is-a relation*, covers many of synset types as synonymy, antonymy, polysemy, homonymy, hypernymy, hyponymy, troponymy and metonymy. On the other hand, the part-whole relation, or *has-a relation*, includes holonymy and meronymy.

WordNet®: It is a large lexical database of English (Fellbaum, 1998, p. 2). The project was started in the mid-1980s and has served not only for the researchers of natural human languages, but also in the field of artificial language. Many of the digital data are based on the synsets and sense relations provided by this database today.

CHAPTER II

REVIEW OF LITERATURE

2.1. Introduction

This chapter covers background information from a range of relevant literature as the backbone of this current study. The first subheading comprises a brief glance over the theoretical framework, and then comes a broader overview of semantic memory as a subsystem of human memory and its constituents. The final issue to be dealt with is the taxonomy of vocabulary learning strategies and the place of semantic mapping as a means of it.

2.2. Theoretical Framework

The history of foreign language learning has witnessed failure as much, if not more, as success. There is a vast array of factors that may add to hindrance as well as facilitation with this respect. Learner's already having certain linguistic capabilities, previous knowledge and experience, or not, is a quite natural embodiment for these variables. As for Spolsky (1989, p. 26), some of these capabilities are universal, such as an innate capability for deriving a grammar. On the other hand, others are specific to each learner's own background, whether linguistic or non-linguistic.

When the issue is the universality, *principles* of the generative grammar serve the requirements which are common to all natural human languages (Chomsky and Lasnik, 1993). Contrary to principles, *parameters* are the elements that really determine the differences between languages. Furthermore, Chomsky argues that language acquisition, as in other aspects of growth, must be inner-directed and is a process better described as "growth" than as "learning" (1995, p. 15). For this reason, learning languages other than native language can be regarded as resetting parameters as long as they are not parallel.

In fact, Chomskyan understanding of a Universal Grammar (UG) does not have much to do with anything but native language. Nevertheless, much research concerned this innatist theory within the scope of second language acquisition. The focal point of debates was basically towards the access to UG, and as White (2003, p. 15) addresses, the hypotheses varied as to whether L2 learners have *no access*, *direct access* or *indirect*

access to it. These terms fueled further conflicts. For example, the term *no access* is a misnomer and should be *partial access* in that UG is at least partially implicated via the mother tongue. Indirect access can also be regarded as *partial access* while *direct access* is also called as *full access*. Hence, there seems to be an ambiguity even in the coinage of the appropriate terms.

Still, language learning does not merely depend on holding the principles of a UG and resetting parameters, or it is not just forming accurate syntactic structures. That means previous knowledge and experience require more than structural rules of a target language. Nevertheless, Gouin's narration of his failure in German as a foreign language represents a plain epitome over the existence of other complex facets. As the story goes (1892, p. 34), he compared the impeccable procedure of his nephew's native language acquisition with that of the turbulent foreign language learning of his own. Although he mastered the grammar of the target language and memorized a whole dictionary, he was unable to comprehend what native speakers of German mean, especially his lecturers at university. It was only after his meeting of his three-year-old nephew and observing how he acquires language. They visited a mill together and his nephew repeated what he saw and learned there for a period of time, and thus activated his input. He blamed the linguistic science of the college, where he bended over backwards to learn German as a foreign language, for deceiving and misguiding him (p. 35).

The implications that can be drawn from Gouin's case are consistent with what UG suggests after all: learning is different from acquisition. The former takes place explicitly while the latter happens implicitly. Reber et al. (1980, p. 492) defines implicit process as in the following lines:

Complex structures, such as those underlying language, socialization, perception, and sophisticated games are acquired implicitly and unconsciously; that such knowledge is memorially encoded in the form of abstract representational systems; and that the acquisition process itself contains at its core an induction process whereby relations among parts of the stimulus environment are mapped in an order that corresponds roughly with the ecological salience of these relations.

Conversely, explicit learning is usually a deliberate attempt and it takes “more trials to reach criterion on a memorization task”. Even though explicit learning might have caused some drawbacks, it cannot be regarded as the only resource of all the inconvenience. Assuming the debates towards the access to UG, modularity is another issue to be handled. As human cognitive system is commonly considered to be modular, he was capable of certain linguistic aspects such as keeping the syntactic rules in mind or the definition of the words.

The story seems to go hand in hand with the tenets of UG, whereas it cannot respond to the main problem: his failure of meaning making, which is quite up-to-date today as well. Knowing the meanings of words is undoubtedly important just like knowing the rules. However, the missing piece can be somewhere else. As for an instance, Gouin was unable to recall the words he learned at first grade when he passed to the second grade (p. 11). He also could not remember the past and past participle forms of irregular verbs. There should be a relation of these two notions. In his groundbreaking book, Pinker (1999) studies how irregular verbs are restored in adult human mind contrary to the rule-based nature of regular verbs. In English, there are 180 irregular verbs that form their past tense in idiosyncratic ways. The only common grounds of these verbs are their being either mono-syllable or two-syllable verbs in which the first syllable functions as a prefix. Knowing these facts, an adult human brain first recalls the knowledge in mental lexicon which is home for irregular verbs, and then heads for the rules of regular verbs, which human babies often fail to do since they have not been exposed to these forms of the verbs. In sum, it can be said that irregular verbs are not much rule-based, but lexical forms kept in a different memory section. Gupta (2002, p. 18) demonstrates the argument of gaining an understanding of meaning by distinguishing what philosophy of language offers in two broad approaches: *the representational approach* and *the conceptual-role approach*. Briefly to say, the second approach attempts to explain meaning via the rules governing the proper use of language. In fact, the detail Gouin missed to grasp in his academic attempt was nothing but representational perspective invoking language-world relations as in the first type of the approaches above. Hence, what was going wrong may be about Gouin’s mental lexicon. Furthermore, the obstacle appears to be related to the organization of the lexicon rather than its capacity.

Today, there is an infinite number of modern Gouins in foreign language classrooms with similar obstacles; they claim to know the rules and the words.

However, what they know about the words is often their definitions or translations. Keeping lexemes in mental lexicon and comprehending them whenever and wherever necessary require more than these; meaning making is plausible only through relating the properties; or semantic relations, of these conceptual items in a suitable type of memory for it.

2.3. Human Memory Systems and Subsystems

As referred in the previous part, different memory systems and subsystems are considered to have a voice in the process of linguistic input. Schacter and Tulving (1994, p. 1) have a corresponding view in which they assume that memory is not monolithic, unitary entity and that what they label memory in fact represents a number of separate but interacting systems. In other words, distinct neurocognitive mechanisms which are characterized by different properties and principles of operation determine the acquisition and the retrieval of different kinds of linguistic information, which is also true for other cognitive processes (p. 4). Then the classification of these systems and subsystems occupy an important place for the attribution of any positive or negative phenomenon with this respect.

They classified three broad criteria to identify different memory systems. The first of these is namely *class-inclusion operations* which argues an intact memory system enables one to perform a very large number of tasks of particular class or category regardless of the specific informational contents of tasks (p. 15). The second criteria is about the *properties and relations* meaning a memory must be described in terms of a property list, that is, an enumeration of its features and aspects by which its identity can be determined and its relation to other systems can be specified (p. 16). The final one is towards *convergent dissociations* between task performances that different systems differentially contribute to constitute a necessary condition for the postulating independent systems (p. 17). However, a single dissociation is often not enough to conclude that there is a sharp difference between tasks.

A fruitful classification requires these criteria, and Schacter and Tulving (1994) enumerated the memory systems and subsystems which were identified by then. It covered five major systems of human memory with the other terms they are also called by, their subsystems and the way of retrieval. Yet another table was provided by Mastin

(2010) in a more simplistic style. In this current study, a hybrid table of both is presented in Figure 1 below:

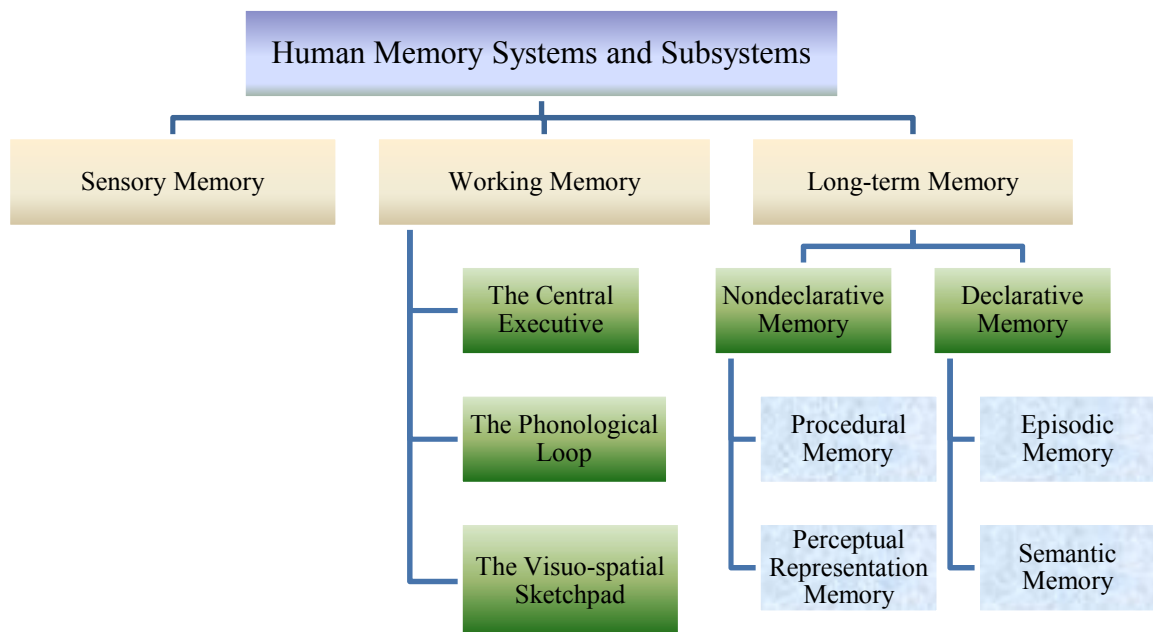


Figure1. Types of human memory systems and subsystems

These systems and subsystems are harvests of various studies brought together under the roof of cognitivism. The terms may have varied in time, but the general outline is still consistent with most of the modern neurological investigations. The following lines will include brief acknowledgements about each in order to find out the appropriate addressee or addressees of the problems towards representational approach concerning vocabulary learning.

2.3.1. Sensory Memory

Senses are usually the first-hand accumulators of information available in nurture. Sensory memory (SM) plays a critical role in the process of transforming the outside world into an inner psychological experience (Bryan and Schafer, 2014). Human senses represent parallelism with those of other living things in many cases; however, the sensitivity and the duration of the memory may vary to a large extent. Although the traditional human senses are related to *sight*, *hearing*, *taste*, *smell* and *touch*, the first two are the most common issues of research in terms of SM. The

common point of SM types is not only their dependency on senses, but also a very limited duration of their storage capability.

The first and the most popular SM is the visual one, or *iconic memory* as coined by Ulric Neisser. In 1959, Sperling carried out an experiment for his doctoral thesis on how much can be seen in a single brief exposure. His argument was towards “more is seen than can be remembered” (1960, p. 1). The underlying assumption was twofold: first, there is a memory limit, and the second is that more information is available during, and perhaps for a short time after, the stimulus than can be reported. He produced twelve letters in total; four letters in three rows for 50 milliseconds. Seeing the letters, subjects were asked to recall them and could do only four in average. On the other hand, they were of the opinion that they had seen more than four letters but could not remember the rest. Therefore, he concluded that the capacity of iconic memory is approximately 40 bits, but its persistence tends to fade rapidly. In a further study of him (1967), the statistics seem to be improved as the subjects could write out around six letters presented tachistoscopically and a delay of 30 seconds did not disturb their performance.

Sperling’s investigations shed light on further research on other senses as well as the sight. For instance, Cowan (1997, p. 56) is of the opinion that with iconic memory, SM for the entire list is largely unusable by the time that the subject is to recall the list, but that auditory SM, which is probably the second most frequently studied type, for the last few items can persist long enough to be used in recall. Still, another point to be considered is whether the *echoic memory*, also known as auditory memory, is unitary. This type is the acoustic equivalent storage system of the visual one (Crowder and Morton, 1969). There is a counter view in this sense which claims the existence of “a very large number of specialized processing mechanisms, each of which may have access to a different dedicated sensory memory with a different characteristic persistence” (Kubovy and Howard, 1976, p. 537). In other words, human cognitive system reveals its modularity also in some occasions of SM systems.

Beside these two types, there is *haptic memory* for touch, *olfactory memory* for smell (which is commonly known as having the longest duration when compared to other sensory memories), and *gustatory memory* for taste. These types are also mostly less than 1 second as indicated by Mastin (2010), and have a limited capacity to store stimuli in this very short duration. Even though there is an outstanding number of study dealing with SM, much of the linguistic research is towards working memory (WM)

and long-term memory. That said, it is out of question that the majority of the stimuli from physical world is perceived by senses at first and very rapid exposure.

2.3.2. Working Memory

It used to be a matter of debate whether there is only a single memory system or a modular set of systems and their subsystems. However, much of the theories have put forward the idea that memory should be a multi-faceted system over centuries. Numerous clinical research in the 20th century approved these assumptions as well; the neurocognitive cases revealed that the second option is apparently true. The investigations focused especially on the existence of a short-term memory (STM) along with a long-term memory. For instance, patients were often able to keep performing the actions attributed to STM despite lesions in the cognitive regions for long-term memory (Atkinson and Shiffrin, 1968, p. 97). Even so, there was another taxonomic ambiguity related to the short term storage.

Several former studies handled it as the primary memory and categorized under explicit retrieval category (Tulving, 1994, p. 841) while the long-term memory was coined as secondary memory. Nonetheless, this terminology had some restrictions. For instance, it is possible that not every temporarily accessible idea is, or even was, in conscious awareness (Cowan, 2009). For this reason, the concept was reconsidered in a number of articles round 1960s. Atkinson and Shiffrin (1968) used STM and the way they consider it gained popularity, though the terminology was previously used by others in a different model. Regardless of its wide use even today, STM was also too broad to be addressed for certain conscious processes. In other words, the term can include both deliberate learning as well as inattentive or behavioral acquisition. Therefore, working memory was termed as a more specific type of STM in order to cover the planned mental processes to keep the obtained external input. Dehn (2008, p. 4) compares the differences between STM and WM as:

- STM passively holds information; WM actively processes it.
- STM capacity is domain specific (verbal and visual); WM capacity is less domain specific.
- WM has stronger relationships with academic learning and with higher-level cognitive functions.

- STM automatically activates information stored in long-term memory; WM consciously directs retrieval of desired information from long-term memory.
- STM has no management functions; WM has some executive functions.
- STM can operate independently of long-term memory; WM operations rely heavily on long-term memory structures.
- STM retains information coming from the environment; WM retains products of various cognitive processes.

Miller, Galanter and Pribram (1960, p. 105) are among the pioneers of the term and as for them, WM is located in the frontal lobe, which is the association area in the inner core system. A man has an organized set of instructions, or plans, that he attempts to execute, and these plans could be temporarily stored (or, perhaps, regenerated) while awaiting execution. Therefore, it can be understood from their point of view that WM is purely a conscious system. These suggestions are noteworthy, but do not identify the components of such a memory. At this point, Baddeley and Hitch (1974) are the prominent figures to mention. They regard WM as a temporary storage system that underpins complex human thought (p. 7), and provide its multiple components in three forms: (1) the phonological loop, (2) the visuo-spatial sketchpad, and (3) the central executive. The first two are also known as slave subsystems.

2.3.2.1. The Phonological Loop

The loop is responsible for both keeping phonological input and its reactivation in a short period of time. Baddeley (2006, p. 6) renders these two components as, namely, a *store* that is capable of holding phonological information over a matter of seconds before the memory trace fades or is refreshed by the *articulatory loop*, which is the second component. This is assumed to involve subvocalization, whereby inner speech is used to rehearse the items, successively retrieving them from the store and feeding them back by means of articulation.

The rehearsal of shorter sequences takes less time as a point is reached whereby it is impossible to rehearse without trace decay (p. 8). That is to say, the phonological loop model assumes that forgetting is a result of simple trace decay within the store. Another issue the study indicates is that the loop has an active role both in the native language acquisition and second language learning in children and adults. However, the

phonological loop, which is located in the left hemisphere of the brain, is regarded to consist of only the phonological store in younger children (Gathercole, Pickering, Ambridge, and Wearing, 2004, p. 178).

2.3.2.2. The Visuo-spatial Sketchpad

There is not a wide variety of stimuli to be used at experiments on this second form when compared to the phonological means. As can be understood from its name, this WM subsystem processes not only while determining spatial location of concepts but also the identification of visual representations. An inference can be made from Baddeley (2006, p. 16) that the use of spatial component is basically in occupations such as architecture or engineering and may be related to other more everyday activities like navigating. On the other hand, the visual aspect of the sketchpad functions especially while creating novel representations.

These notions are also attributed to concepts' being dynamic or static as well. Pickering et al. view the sketchpad from this standpoint and speculate that the visuo-spatial sketchpad may be made up of separable components for dealing with visuo-spatial information in the form of static patterns and paths of movement. Still, the overall idea does not refute the visuo-spatial sketchpad, but adds details to it.

2.3.2.3. The Central Executive

The central executive is like the big brother of all WM. Baddeley (2006, p. 16) notes that he and his friends treated it as if it were a homunculus, a little person who ran things and whose activity could be used to explain all the issues that lay beyond the limits of the two subsystems. Still, temporary visual and verbal stores are also regarded to be controlled by an attentional system. Smith and Kosslyn (2006, p. 281) itemizes five basic executive processes as:

- The kind of selective attention that typically acts on the contents of working memory and directs subsequent processing so as to achieve some goal. This kind of attention—often called executive attention—is to be distinguished from the kind that selects certain spatial positions in the outside world and determines what gets perceived in the first place.
- Switching executive attention from one activity, or process, to another.

- Ignoring or inhibiting information that has already been perceived.
- Scheduling a sequence of activities.
- Monitoring your performance.

The first attempts towards the analysis of the central executive focused on a distinction between WM processes that engage storage mechanisms only and the ones that engage executive mechanisms besides storage mechanisms. Reuter-Lorenz and Jonides (2007, p. 264) argue instead that all working memory is best conceived as requiring storage and the sort of attentional control processes that define the central executive. Their neuroimaging investigations both on animals and humans provided evidence for the recruitment of a frontal-parietal executive attention system in tasks presumed to emphasize only storage. Therefore, it is understood that the presumption of WM merely as a short-term storage is not a healthy view. Rather, the processes taking place in this memory system are subject to attention.

Generally speaking, the roles of WM in several phenomena that people experience have been analyzed so far and numerous indications have been suggested. Many of the studies are towards the correlation between WM and health, yet not less than those are on WM and academic success. As an instance, Alloway and Alloway (2010) found that working memory at the start of formal education is a more powerful predictor of subsequent academic success than IQ. However, Carroll (2008, p. 61) is skeptical about these correlations as it could be that increases in working memory led to increases in, for example, vocabulary, but in principle the reverse is also possible. That is to say, which one triggers the other or do they interact simultaneously is still a matter of debate. As a matter of fact, there is still a long way to go in the field of working memory, and the overall suggestions drawn from the investigations so far are far from providing a complete picture, especially one that is fully applicable to academic learning (Milton, 2008, p. 49).

2.3.3. Long-term Memory

Similar to the evolution of terminologies for the previous memory system mentioned above, the term *long-term memory* (LTM) also followed a gradual path. It was previously called as secondary memory by, for example, William James in the last decade of the 19th century (Hill, 2014) and its being secondary did not use to mean to be

inferior to the primary memory. Rather, it indicated the chronological order of the cognitive system since information is first processed in primary memory, and then moves up to the secondary memory to be kept.

Transfer of information from WM (or STM) to LTM via, say, rehearsal or other relevant alternative ways has long been regarded as gradual learning (Atkinson and Shiffrin, 1968, p. 27). Thus, LTM can be regarded to be of vital importance for learning. In fact, James called secondary memory as “true” memory because of its two distinct features: “remembered events seem to belong to the past, and their recollection is brought about by appropriate cues.”

The taxonomy of memory subsystems is rather a demanding process in all three systems. That is usually because of either the obscurity of certain subsystems, or their comprising a wider scope when compared to the others. When the issue is LTM, both of the options are true and they are probably more evident than the other two systems. The subsystems are so interwoven that a certain term is used as a synonym of another by some researchers while the same term can be used as a component of the other by researchers else. With this ambiguity in hand, the subsystems to be mentioned hereafter can be viewed as a combination of several taxonomies (Atkinson and Shiffrin, 1968; Tulving, 1994; Mastin, 2010) to provide as simple a pathway as possible to track.

2.3.3.1. Nondeclarative Memory

Nondeclarative memory is more often called as implicit memory, whereas it will be renounced in this study since the former evokes a system much better and the latter rather connotes the notion that is stored in a system. In other words, nondeclarative memory is regarded as a system and implicit memory is what is stored and executed in it hereafter. Therefore, nondeclarative memory is responsible for unconscious mental functions in LTM.

As for Squire, Knowlton, and Musen (1993, p. 471), this type of memory includes several forms of learning and memory abilities and depends on multiple brain systems. Skills and habits, conditioning and priming, which “refers to an improved facility for detecting or identifying perceptual stimuli based on recent experience with them” (p. 478) are the processes during which awareness is not always necessary. That means in many examples of such functions a nondeclarative memory works.

Another study by Reber et al. (1980, p. 492) highlighted a further quality of nondeclarative memory. Their theory was that complex structures, such as those underlying language, socialization, perception, and sophisticated games are acquired implicitly and unconsciously. For this reason, abstract representational memory systems were needed in which such knowledge was to be encoded and the acquisition is an inductive process in which mental relations are mapped to correspond in their ecological salience. They concluded from their findings that in any complex learning task, there is a subtle coordination between explicit, conscious processes such as hypothesis testing and overt rule induction and the unconscious, covert processes of implicit apprehension (p. 496). Still another conclusion indicated that of the various possible combinations of explicit and implicit training procedures, it seems clear that the optimum mode is that in which the subjects begin with explicit information about the structure of the grammar.

Although the categorization of processes which are under the roof of nondeclarative memory still continues, a basic level analysis was provided by Schacter and Tulving in the last decade of the 20th century. They enlisted a number of functions as being either procedural or perceptual representation (PRS). In fact, the study aimed at using these terms not as the subsets of nondeclarative but as alternatives for it. On the other hand, the processes they cover show difference and thus they seem to be two distinct subsystems.

2.3.3.1.1. Procedural Memory

Procedural memory is a nondeclarative memory and retrieved implicitly. It is also known as skill memory and is used to recall the knowledge of how to do something (Hill, 2014). Schacter and Tulving (1994, p. 26) enlisted motor skills, cognitive skills, simple conditioning, and simple associative learning under this heading. As a matter of course, a substantial part of behaviouristic literature would utilize the findings on this type of memory for generalization.

Thanks to the neuroimaging systems used for the mapping of human brain, researchers are able to produce more tangible theories today. Procedural memory is inevitably among the most commonly investigated cognitive systems and it has been analyzed in terms of its linguistic functions as well. Certain means of languages have long been assumed to be implicit, and specifically procedural. As an instance, it was stated previously in this study that Pinker (1999), an eminent evolutionary psychologist,

distinguishes irregular verbs from the regular ones in that the former are stored in mental lexicon just like other lexemes while the latter are subject to a set of rules. For this very reason, it is assumed that regular verbs are the products of procedural memory; a set of rules are acquired and infinite number of verbs are produced implicitly whenever necessary.

The studies in this vein were not basically upon second language until the fMRI investigation performed by Pliatsikas et al. (2014). That is to say, the previous studies underlined the implicit facet of certain linguistic functions from a procedural point of view. On the other hand, they investigated the morphological processing of regular verbs in native and highly proficient late L2 English speakers. The results provided evidence for native-like involvement of the procedural memory system in processing of regular past tense by late L2 learners of English. All in all, it can be argued that procedural memory has been the kernel of numerous debates unavoidably and may even date back to the first conflicts between the early rationalists and empiricists.

2.3.3.1.2. Perceptual Representation Memory

Perceptual Representation System (PRS) was another nondeclarative system mentioned in Schacter and Tulving (1994, p. 26). The subsystems used by PRS were indicated as visual word forms, auditory word forms, and structural description. These subsystems were mentioned to be retrieved implicitly. A typical operation in this sense is priming. As stated previously, it is responsible for detecting or identifying perceptual stimuli and is dependent to experience. Moreover, it is attributed to process highly implicitly.

This system includes both nonlinguistic functions such as the face recognition (Schacter, 1990), and also linguistic functions such as repetition priming (Casale and Ashby, 2008, p. 983). It is at a presemantic level in that human category learning is attributed to this perceptual memory. On the other hand, Casale and Ashby are skeptic about its being perceptual since research revealed that PRS is not a purely perceptual memory system. In other words, it includes sensory brain areas very often, but may also include nonsensory ones, though very rarely. Although the neural basis of PRS remains to be unclear and little is known about PRS itself, the common view is towards its being another separate nondeclarative long-term memory system.

2.3.3.2. Declarative Memory

Due to the conscious retrieval of information, declarative memory system is commonly known as explicit memory (Reber et al., 1980). However, certain aspects in this system, such as the semantic subsystems, were sorted into implicit memory in early research (Tulving, 1994, p. 841). For this reason, declarative memory is to a large extent explicit, yet multiple brain systems -including implicit ones- may contribute partially on it as the case is also true in other systems.

The difference between “known” information and “learned” information, which is also a crucial issue of this current research in terms of vocabulary, provides a better understanding for the discrimination of declarative memory from being a purely explicit memory. As for Tulving (1985), “knowing” is when one has a sense of familiarity about a previously presented item, without actually recollecting a specific previous encounter with the item. On the other hand, “learning” takes place in order to remember facts, words, numbers and the like at a later time exactly (Leech et al., 1997, p. 746). Furthermore, Knowlton and Squire (1995, p. 699) introduces “remembering” as a process when an old item evokes a recollection of having specifically encountered the item. Despite these contrasts, Knowlton and Squire suggest that remembering and knowing, and thus learning, are related to explicit and implicit memory respectively. That means declarative memory is not solely based on explicit memory.

The distinction between declarative and nondeclarative memories is that the former primarily consists of the capacity for conscious recollection of the facts and events from previous encounters about a particular domain. Conversely, the latter, as was previously said, depends on various forms of nonconscious memory which support skill and habit learning, simple conditioning and priming expressed through performance and not necessarily utilize conscious memory content (Dacin and Mitchell, 1986, p. 454; McKee and Squire, 1993, p. 397; Squire and Zola, 1996, p. 13515). The subsystems of declarative memory have always been quite popular fields of research since they are strongly associated with pedagogy in terms of episodic and semantic operations.

2.3.3.2.1. Episodic Memory

Episodic memory makes it possible for a person to remember specific events which were experienced before. It enables someone to be consciously aware of an

earlier “episode” (Hasselmo, 2012, p. 31) in a certain situation at a certain time. That is, it concerns the self’s experiences in subjective space and time (Tulving, 1993, p. 67).

Over the last four decades, the concept of episodic memory has evolved into a multifaceted construct that is of great interest to researchers in various areas of psychology and neuroscience (Szpunar et al., 2013, p.3). A number of specific tasks have been inspected to be operated through this construct. Conway (2009, p. 2306) enlists these properties of episodic memory as in the following lines:

1. Contain summary records of sensory-perceptual-conceptual-affective processing.
2. Retain patterns of activation/inhibition over long periods.
3. Often represented in the form of (visual) images.
4. They always have a perspective (field or observer).
5. Represent short time slices of experience.
6. They are represented on a temporal dimension roughly in order of occurrence.
7. They are subject to rapid forgetting.
8. They make autobiographical remembering specific.
9. They are recollectively experienced when accessed.

When the issue is the scheme of this memory system, he (p. 2307) proposes three types of representations: episodic elements (EEs), simple episodic memories (SEMs), and complex episodic memories (CEMs). EEs are probably the most event-specific, most experience-near representations in long-term memory usually in visual forms. These elements are stored in frames; organizations of either a single EE, or generally of a set of EEs. Each organizational unit can be called as a SEM. However, experiences are often composed by the interaction of several SEMs, and thus form CEMs.

Episodic memory may be regarded as an explicit system as much or episodic recalls are consciously done. Still, it has such an interdependent nature with other systems and subsystems that early studies towards the identification of memory types did not used to handle it as an autonomous system. In fact, it might well be thought as a junction in the middle of human cognitive system.

2.3.3.2.2. Semantic Memory

Episodic memory could be theorized as a separate system only in 1972 by Endel Tulving, which is today supported by numerous neuroimaging models. Previously, it was referred to be an integrated system within semantic memory. However, the suggestions indicated their being to autonomous systems. On the one hand, episodic memory is to store information of what, where, and when a discrete event happened in one's own past experience –and thus autobiographical. On the other hand, semantic memory is essential for language use and keeps the knowledge of words and symbols, what they mean, what they refer to, and how they are related and used (Phillips, 2013).

In accordance with what Tulving suggested (1972, p. 841), semantic memory processes one's generic factual knowledge. That is to say, its designation is based on "general knowledge of the world". To restore such knowledge, spatial learning takes place at firsthand and whatever is attained can be related to the already existing knowledge, which is composed of previous experiences. Taking its role in language learning mentioned above, this current research aims at providing a better understanding towards the nature of a vocabulary learning strategy which utilizes semantic memory in an effective way.

Then the query towards the structure of semantic representations in human memory system is of high importance. With this regard, Hart and Kraut (2007, p. 342) posit a category-based and/or feature-based framework, depending upon the specific semantic memory system (lexical semantic, visual, sensorimotor, etc.). Furthermore, the types of the relations which constitute these schemata are other noteworthy points to be handled. It is a well-known fact that there are several types of semantic relations (Noordman, 1979, p. 24) with this respect. However, they are labeled in a variety of ways. Hence, there seems to be a need for a clear taxonomy, which will be provided in the further sections.

2.4. Semantic Memory and Schema Theory

Schema Theory can be accepted as a groundbreaking attempt to the analyses of human cognition. A correlation between this theory and the systems and subsystems stated above, especially the episodic and semantic memories, sounds sensible since a schema represents a class of things, events, or situations. In fact, it is not surprising to underline those two LTM subsystems since their recall processes has long been known

to show variation when compared to the other systems (Maillet, 1972, p. 180). When the issue is human psychology, Bartlett was the pioneering researcher to use the term “schema”. As cited in Wolters (1933, p. 376), Bartlett (1932) regards schemata not only as “acquired characters of the reacting organism; they are also existent entities.”

Besides, Anderson is the first to view schema from a pedagogical perspective. As for him (1977, p. 2), it represents general knowledge and is conceived to contain a slot or placeholder for each component. Such knowledge, abstracted in schemata, is stored in memory (Anderson and Pearson, 1984). Related pieces of knowledge are tied and they interact by this means. To interpret a particular situation in terms of a schema is to match the elements in the situation with the generic characterizations in the schematic knowledge structure (Anderson et al., 1978, p. 434). As our mental cognitive system is exposed to new information, it aims at relating this new piece with an already existing knowledge by placing it into the relevant slots of the schemata. Anderson et al. claimed that this very same schemata provides ‘ideational scaffolding’ for text information on reading activities (p. 12). In a further study (Anderson et al., 1987, p. 266), a correlation between having a large-scale, long-term vocabulary growth and the acquisition of new schemata, or restructuring existing ones, was indicated. Furthermore, providing opportunities to enhance students’ repertoire through new schemas is attributed to be of high importance. Such a repertoire of vocabulary, also known as mental lexicon, definitely requires a strong semantic memory structure.

Axelrod’s illustration (1973, p. 1248) is germane to the vitality of this process. Think of a person who believes that all of his friends like each other and the enemy of one of those friends is also the enemy of the others indirectly; therefore, it may also mean that an enemy’s friend is enemy. In sum, he has a balanced set of beliefs in terms of friendship relationships. However, it is a too narrow schema which consists of only two slots. Individuals’ scope can only be widened through connecting new slots into the schemata. In a similar vein, learners’ knowledge of, say, vocabulary can be enriched through following a similar path.

Granting all this, Alba and Hasher (1983) were skeptical about the caliber of schema theory. Assuming the operation that takes place in memory, four central encoding processes proposed by their prototypical schema theory are: *selection* of incoming stimuli; *abstraction* of them into conceptual meaning; *interpretation* for the comprehension of new stimuli through relevant prior knowledge; and its *integration* into holistic memory. The processes may sound reasonable, whereas they argued that

memory representation is far richer and detailed than schema theory would suggest. However, McVee et al. were of the opinion in their 2005 study that there is a misconception about the definition of schema theory, which hinders the ideology gain power. They approach to schema theory from a sociocultural point arguing that our individual schematic understandings emerge from, but are not reducible to, our sociocultural transactions with others (p. 556). Three key points that they reminded are:

(1) Schema and other cognitive processes or structures are embodied- that is, who we are as biological beings determines our sensorial interactions with the world and thus the nature of the representations we construct; (2) knowledge is situated in the transaction between world and individual; and (3) these transactions are mediated by culturally and socially enacted practices carried out through material and ideal artifacts.

It is clear, as a result, that human cognitive schemata cannot be evaluated as a memory system independent of sociocultural stimuli. Then language classrooms, which are no doubt among the environments one is exposed to the construction of schemata very commonly, are favourable places to observe the occupants of the slots and their semantic relations. Moreover, today's students are enculturated in a media-rich environment, which has influenced both their social practices as well as their cognitive processes (Sontag, 2007). With this in mind, learning strategies that are compatible and appropriate to such an environment should be provided for the learners to practice their knowledge and also to supply novel stimuli.

2.5. Lexical Semantic Relations (LSRs)

From a schematic point of view, the constituents of semantic memory in terms of vocabulary growth are undoubtedly of vital importance. In other words, there should be some sort of relations between a certain vocabulary item as a new knowledge and other items to share the same schema in different slots, and thus they can interact. Therefore, it is necessary to categorize what these occupants of slots and their ties are. Those LSRs have a variety of types, and they can be categorized under 'has-a' relations and 'is-a' relations, though there is not only a single certainly recognized taxonomy. The taxonomy used in this current study is based on and almost identical to the one

provided in the WordNet[®] project. Briefly to say, it is a large database of content words in English which are grouped into sets of cognitive synonyms (synsets), each expressing a distinct concept. Fellbaum (2005) suggests that synsets are interlinked by means of conceptual-semantic and lexical relations. Those relations will henceforth be called as lexical semantic relations (LSRs) in this study (see Appendix I for a simplified student manual of LSRs with examples).

The former category serves for the relation of part and whole. *Meronymy* is the one which is based on part to whole. Meronyms can be either ‘necessary’ or ‘optional’ parts. (Lyons, 1977). *Holonymy* is the converse relation of meronymy (Murphy, 2006) and a holonym is a holistic unit which consists of meronyms.

The latter category bears a rich number of relation types when compared to the has-a relation. Two of these are *hyperonymy* and *hyponymy*, which stand for the super-subordinate relation (Fellbaum, 2005). In other words, if X is a hyponym of Y, then the extension of X is a subset of the extension of Y. Thus, we can say that hyponymy is a relation of inclusion. Its converse is hyperonymy (Murphy, 2006). A third one called *troponymy* is similar to hyponymy in that it relates only verb synset pairs such that one expresses a particular manner of the other (Fellbaum, 2002).

Some words, on the other hand, associate with multiple meanings causing lexical ambiguity. Such relations include *polysemy* and *homonymy*, which are often confused with each other. According to Murphy (2006), meanings of words extend or shift so that a single lexical item has several distinct senses in polysemy. While the lexical items have systematic polysemy relation if they are of a particular semantic class such as ‘glass’ and ‘cup’ as a container to drink, it is called non-systematic when their relation is limited with having two related senses but not part of a larger pattern as in ‘a person’s leg’ and ‘the leg of trousers’. There are usually some sensible semantic or pragmatic relations of polysemes. Conversely, homonyms are coincidental forms sharing the same phonological or written forms. That is, homophones are two distinct words pronounced in the same way, whereas homographs are written without any difference. Despite several debates such as their being phenomena rather than LSRs (Bergenholtz and Agerbo, 2014), both are widely accepted as in the latter category.

A further example of is-a relation can be regarded as *metonymy*. Metonyms are usually compared with metaphors due to their being figures of language; however, they are evidently different forms. Metaphors are based on analogy, whereas metonyms can stand alone in lexicon with certain sense relations (Nerlich, 2006). For that reason,

metonyms have potential to have its place among the LSRs. Inevitably, metonyms trigger homonyms as well.

Among all the other relations, *synonymy* and *antonymy* are probably the most distinguished two on which not only lexicographers, but also learners and teachers focus intensively. A synonym can be defined as ‘a word which has the same, or nearly the same, meaning as another word’ and an antonym ‘a word which is opposite in meaning to another word’ (Richards and Schmidt, 2002). Still another controversy rises regarding these relations, basically towards how inclusive they are. Fellbaum (2002) regards synonyms as ‘words that denote the same concept and are interchangeable in many contexts’. From this point of view, certain hyponyms may also function as synonyms. There has been some opposition to this approach claiming that synonyms are only ‘identical semantic representations’, yet Murphy (2006) believes that synonyms derive via a pragmatic principle ‘relation by contrast’. Such an ambiguity is true for antonymy too whether the terminology should be limited with direct antonyms, or indirect antonyms are to be included. In brief, some researchers emphasize contrasting gradable predicates as antonyms, while any lexical pairs that constitute semantic opposites are regarded so by many others (Murphy, 2006).

Based on the cognitive findings stated previously, LSRs are of high importance for linguistic schemata in terms of being their basic lexical constituents, and thus for a large-scale, long-term vocabulary growth. However, the taxonomy to name and group these relations seems to be conflicting in many occasions, which may cause some obstacles in certain linguistic fields such as lexicography. The flexible nature of contexts in many occasions makes lexicographers continue to offer only vague descriptions and struggle to present meaning, and hence sense relations, as context-dependent, variable and dynamic (Storjohann, 2010, p. 9). As an example, definitions of the words “fast” and “quickly” supported by LSRs may provide better grounds for learners to understand their meanings than most other lexicographic techniques. However, learners are often limited with synonyms and antonyms in many commercial resources. Considering a great deal of dictionary users are foreign language learners, all these linguistic ambiguity and conflicts underlie further problems in language education by making things even more difficult rather than facilitating, though it was probably not what is intended. As a result of this, the vocabulary learning strategies conducted in foreign language instruction should be assured of the utilization of these relations in a broader scale.

2.6. Vocabulary Learning Strategies

In general, learning and teaching strategies are neither dependent nor independent at all. Rather, they are interdependent; one usually has implications over the other (Grenfell, 2000, p. 1). The basic difference between these two sets is in terms of their organizers. That is to say, a strategy can be called as a learner strategy when learners consider performing it themselves while it can be called as a teacher strategy when a teacher plans to integrate it for the benefit of instruction.

Richards and Schmidt (2002, p. 515) define language learning strategies as those “conscious or unconscious processes of which language learners make use in learning a language.” Learners take these steps to enhance their learning because they are tools for active, self-directed involvement, which is also essential for communicative competence (Oxford, 1990, p. 1). In fact, even in our first language we use strategies to get around linguistic problems such as not knowing a word, or not being able to recall it when it is necessary (Thornbury, 2002, p. 150).

1970s witnessed many innovative ideas in language instruction since psychology and thus education had evolved in many ways. Because social and cognitive approaches gained power, studies towards language learning also became one of the most popular issues in the field. Another prominent progress was made in the field of learning strategies. However, the combination of both, as Schmitt (1997) indicates, remained untouched. What is more, he underlines that many learners do use strategies for learning vocabulary (p. 3).

Vocabulary learning strategies (VLS) obtained a late fame; yet do not seem to lose it as long as there are learners of foreign languages. That might be an outcome of a movement away from a predominantly teaching-oriented perspective to one that includes interest in how the actions of learners might affect their acquisition of language (Schmitt, 2000, p. 132). Then the qualities of VLS should be analyzed to understand how and why these strategies facilitate learning. Nation (2000, p. 352) stresses that a strategy needs to involve choice as there are several strategies to choose from. It should also include several steps to learn, which requires a complex nature. For him, the basic requirements of a strategy are knowledge and benefit from training. When practiced, it must increase the efficiency of vocabulary learning and vocabulary use. In a similar vein, Schmitt (2000, p. 133) sorts the variables on which the effectiveness of learning strategies depends as the proficiency level, native language, culture, motivation, and

purposes of the L2 learner group as well as tasks and texts being used, and the nature of L2 itself. Furthermore, cooperation of the learners is of high importance since resistance to strategies may turn into failure.

A further noteworthy remark is towards the differences between vocabulary teaching strategies (VTS) and VLS training. The purpose of VTS is basically facilitating the load of instruction in language classrooms (see p.172 in Takac, 2008 for an inventory of VTS). However, VLS training is distinct in terms of its purpose. The aim of VTS is introducing and presenting the meaning and form of a lexical item, stimulating learners to revise, practice and consolidate vocabulary through various tasks (Takac, 2008, p. 106). The goal of training, on the other hand, is to provide strategies for learners to discover target vocabulary or consolidate new words. A number of approaches to strategy training are:

Explicit or direct training: learners are given information about the value and purpose of particular strategies, taught how to use them, and how to monitor their own use of the strategies.

Embedded strategy training: the strategies to be taught are not taught explicitly but are embedded in the regular content of an academic subject area, such as reading, maths or science.

Combination strategy training: explicit strategy training is followed by embedded training (Richards and Schmidt, 2002, p. 516).

Even though there are dozens of strategies to use for vocabulary growth, learners may often adopt certain strategies as their stereotypes, falling apart with the others. Such an incidence may prevent their practice from enthusiasm which is no doubt vital for their inner motivation as well. Therefore, some sort of conscious guidance sounds reasonable. With this respect, Nation (2000, p.358) also states that it is important to make training in strategy use a planned part of a vocabulary development programme. The plan that he put forward involves:

1. deciding which strategies to give attention to
2. deciding how much time to spend on training the learners in strategy use
3. working out a syllabus for each strategy that covers the required knowledge and provides plenty of opportunity for increasingly independent practice

4. monitoring and providing feedback on learners' control of the strategies.

In the overall scheme of the strategies used in throughout the treatment procedure of this current study, the training which the participants received was a combination strategy type. The strategies to be used were determined by the researcher, and then a timetable was organized and implemented to the curriculum of the class. The vocabulary list based on the new words to be practiced was obtained from the syllabus and was provided to the students for each session. Accumulation of the data from the participants and testing their progress represent the monitoring process. The steps except from the initial one required mostly nothing but a systematic effort put both by the researcher and the treatment group. However, an inventory of VLS was needed at firsthand so that a number of these strategies could be selected and adapted to the plan. When the issue is language learning strategies in general, a number of taxonomies, which resemble one another to a large extent, are available (O'Malley et al., 1985; Oxford, 1990; Grenfell and Harris, 1999; Macaro, 2001 etc.).

2.6.1. Schmitt's Taxonomy of Vocabulary Learning Strategies

The strategy lists provided in many of such studies are more or less a combination of several skills such as listening and reading. On the other hand, it has taken quite a long time to focus on skill-based classifications. For instance, an appropriate inventory specifically of VLS emerged only in the 1990s. Schmitt (1997) attempted to accumulate VLSs and categorize them using hybrid taxonomy of Oxford's taxonomy of general language learning strategies (1990), and the distinction suggested by Cook and Mayer (1983) and Nation (1990).

Oxford's system includes the strategy categories of Memory, Cognitive, Compensation, Metacognitive, Affective and Social. Memory Strategies are also known as *mnemonics* and dates back as far as the prehistoric era. The principle of the strategies in this category is to create in the mind an artificial structure that incorporates unfamiliar ideas or, especially, a series of dissociated ideas that by themselves are difficult to remember (Nolen, 2014). Oxford (1990, p. 39) stratifies these strategies as either of (a) creating mental linkages, (b) applying images and sounds, (c) reviewing well, or (d) employing action. As an instance, the core strategy applied in this current research was semantic mapping, which is categorized as an image system to be applied.

Image meant here is not necessarily a picture of a concrete notion; rather it may also refer to the neural negotiation for meaning. Bugelski (1970, p. 1011) agreed that words have a way of arousing images, and if the images are not the same, communication fails. He illustrates this idea by giving an example from a trial. A word like "justice" arouses different reactions among the antagonists at a trial.

Memory Strategies may potentially be confused with Cognitive Strategies, but the latter are "not focused so specifically on manipulative mental processing; they include repetition and using mechanical means to study vocabulary" (Schmitt, 1997). The four basic categories under this system are: (a) practicing, (b) sending and receiving messages, (c) analyzing and reasoning, and (d) creating structure for input and output (Oxford, 1990, p. 44). In a nutshell, the former group of strategies is concerned more with the ideological tenets of the piece of language while the latter is busy with structural functions.

The next set of strategies is towards Compensation and it is not only related to understanding language, but also producing it. That is to say, language learners use it both for the analyses of the input of the message transmitted, and also for the production of output. As a natural result of its being twofold, Compensation Strategies are either in the form of (a) guessing intelligently, or (b) overcoming limitations in speaking or writing (Oxford, 1990, p. 48). In fact, such strategies are often evident in Communication Strategies as well and usually in terms of the lexemes to be used in conversations. For example, Dörnyei and Scott (1997) regards the use of similar-surrounding words as a means of compensating for a lexical item whose form the speaker is unsure of with a word which sounds more or less like the target item. The strategies in this category are also indicated to bear a significant correlation with the personality traits of their users (Fazeli, 2012).

Coming back to the Cognitive Strategies, another group which they are often confused with is Metacognitive Strategies. O'Malley and Chamot (1990, p. 207) define the former, on the one hand, as the strategies in which the learner interacts with the material to be learned by manipulating it mentally or physically. The mental manipulation can be in terms of making mental images, or elaborating on previously acquired concepts or skills. Conversely, physical manipulation can be as grouping items to be learned in meaningful categories, or taking notes on important information to be remembered. Metacognitive Strategies, on the other hand, involve executive processes in planning for learning, monitoring one's comprehension and production, and

evaluating how well one has achieved a learning objective. For Oxford (1990, p. 17), the strategies in this category have the qualities of either of the (a) centering one's own learning, (b) arranging and planning one's own learning, or (c) evaluating one's own learning. Anderson (2002) deduces that when learners reflect upon their learning strategies, they become better prepared to make conscious decisions about what they can do to improve their learning. That is to say, strong metacognitive skills empower second language learners. In a further study, Pei (2014, p. 1151) opposes this idea with his findings indicating a negative correlation between the instruction of metacognitive strategies and metacognitive awareness as well as reading comprehension success. However, the contribution of Metacognitive Strategies may better be understood over their impact in terms of making learners more aware of learning strategies rather than guiding them to learn, as implied by McCabe (2010). In other words, an appropriate definition of metacognition can be "learning how to learn" rather than learning a specific content, and it can guide learners to improve their skills on searching for information rather than merely a scaffolding tool which stimulates success directly.

Oxford classifies her taxonomy under two groups as direct and indirect strategies and Metacognitive Strategies are under the indirect ones along with Affective Strategies and Social Strategies. For her (p. 17), (a) lowering one's own anxiety, (b) encouraging himself/herself, and (c) taking one's own emotional temperature are the affective side, while (a) asking questions, (b) cooperating with others, and (c) empathizing with others form the social aspect. Of course social and affective facets of individuals are distinct from each other, whereas O'Malley and Chamot (1990, p. 197) preferred to define them together as the strategies in which the learner either interacts with another person in order to assist learning, as in cooperation or asking questions for clarification, or uses some kind of affective control to assist a learning task.

Oxford's taxonomy of Language Learning Strategies could not meet the needs for an appropriate taxonomy of Vocabulary Learning Strategies, though. In addition, Schmitt was convinced of the *structured overview* as introduced in Cook and Mayer (1983, p. 120). According to their suggestion, it is twofold: It first attempts to introduce the technical vocabulary or key concepts of a particular unit. Second, it tries to develop meaningful connections between these concepts such that they correspond to the interrelationship being developed in the unit. In a similar vein, Nation (1990) describes the *learning burden* as the more a word represents patterns and knowledge that the learners are already familiar with, the lighter its learning burden. Therefore, Schmitt

produces his taxonomy of Vocabulary Learning Strategies which consists of two main categories as *Strategies for the Discovery of a New Word's Meaning* and *Strategies for Consolidating a Word Once it has been Encountered*. The former category includes Determination Strategies (DET) and Social Strategies (SOC). The latter category also includes its peculiar Social Strategies (SOC) as well as Memory Strategies (MEM), Cognitive Strategies (COG) and Metacognitive Strategies (MET) (see the Appendix II for a full list of the taxonomy). However, an issue was still awaiting action: a clear-cut discrimination of Memory Strategies and Cognitive Strategies. To do so, he benefitted from Purpura's (1994) division of storing and memory strategies into six areas: (a) repeating, (b) using mechanical means, (c) associating, (d) linking with prior knowledge, (e) using imagery, and (f) summarizing. The taxonomy handled (a) and (b) as Cognitive Strategies and the rest as Memory Strategies.

A number of the strategies in this inventory were practiced during the treatment procedure of this current study. The Memory Strategies were just represented by Semantic Mapping as it also constitutes the core of the whole treatment. The strategies from all the other categories were used as supplementary strategies to it since no strategy is appropriate to be used as a panacea for all vocabulary needs. While selecting these supplementary strategies, there were two criteria to be considered: The first is the percentages given in the taxonomy table which indicates the use and helpfulness statistics of each strategy. A second point considered was the familiarity of the learners to the strategies. The following lines will give brief data about the strategies used in this study.

2.6.1.1. Vocabulary Learning Strategies Adopted for the Treatment

The treatment session of this study utilized 16 strategies from Schmitt's taxonomy. 15 of these were used as supplementary strategies and each of the categories stated above was represented by three strategies, and thus five strategy categories were scheduled as in Table 10. Besides, Memory Strategies were not provided in this timetable since it was demonstrated merely by Semantic Mapping each week since it is the focus of the whole process. The following 15 strategies described henceforth are these supplementary strategies while the final one to be mentioned, namely Semantic Mapping, is the backbone strategy of this study.

2.6.1.1.1. Strategies for the Discovery of a New Word's Meaning

The strategies in this category are usually used when a language learner is exposed to new vocabulary in order to get an overall framework of the target words. It is especially influential to apply such strategies for relevant input.

2.6.1.1.1.1. Discovery-Determination Strategies

Bilingual dictionary: It is quite evident that foreign language learners are usually urged to use monolingual dictionaries such as Monolingual English Language Dictionaries (MELDs). Lew and Sałaciak (2014, p. 55) speculate that the persistence of this belief may be due, at least in part, to a simple lack of awareness that good bilingual alternatives exist, alternatives which are more helpful in both reception and production to learners at all proficiency levels. Still, they delimit this view leaving the advanced learners out.

Bilingual dictionaries emerge in two couples of types (Hannay, 2003). A dictionary with this regard can be either production-oriented or reception-oriented (p. 145). Briefly to say, the former provides the examples or patterns for the active use of a target word, whereas the latter is more functional in terms of providing meaning, for instance, in a given context. The second couple of classification is towards the uni-directional or bi-directional form of bilingual dictionaries (p. 149). Some dictionaries offer only from the target language to first language use, or vice versa, while the others provide a two-way function.

A further point worth mentioning is online bilingual dictionaries with this respect. Such dictionaries are among the early online language tools. However, their reliability is often a debateful issue. In order for an online bilingual dictionary to be free from questions, it should have a real and public author; be oriented to the main addressee or user; be designed according to its lexicographical function and main objectives; and be organized considering the relevant structure types of the words (Gelpi, 2004, p.10). The percentage of the use of this strategy is 85% while its helpfulness rate is 95% in Schmitt's taxonomy. The participants of the treatment process of this study were also acknowledged about relevant bilingual dictionaries beforehand.

Check for L1 cognate: A cognate is a word in one language which is similar in form and meaning to a word in another language because both languages are related

(Richards and Schmidt, p. 82). Turkish, the mother tongue of the target population, and English are not etymologically related languages and thus most of the commonalities between their lexicons are not cognates at all. Rather, they are either “borrowings”, words or phrases which have been taken from one language and used in another language (p. 56), or “false cognates”, which are words having the same or very similar form in two languages, but with different meanings in each (p. 198).

A large proportion of the borrowings, or loanwords, in Turkish are from French which was dominant until the World War II. However, English has gradually taken the priority over since then (Yetkin, 2011, p. 209). Despite the etymological boundaries, Uzun and Salihoğlu (2009) examined approximately 80,000 English words and determined 2411 cognates or false cognates in Turkish. In fact, a vast number of French words which has an active use in Turkish and other 600 words borrowed from Italian, as stated in Yetkin’s study, may also contribute to the list of cognates and false cognates within English and Turkish. 11% of the participants acknowledged that they check for L1 cognate and only 40% of these respondents regarded as a useful strategy in Schmitt’s survey.

Guess from textual context: A *text* can be defined as a semantic unit which is made of meanings; not only words and sentences. It is a social exchange of meanings (Halliday and Hasan, 1990, p. 11). Oxford Dictionaries (2015) define a *context* as “the circumstances that form the setting for an event, statement, or idea, and in terms of which it can be fully understood,” and exploring context involves much bigger issues – the ‘circumstances’ that contribute both to its production by the author and to its reception by the reader (Beard, 2001, p. 6).

The three features of the context of situation enlisted by Halliday and Hasan are the *field* of the course, the *tenor* of discourse, and the *mode* of discourse (p. 12). As widely known, the field is what the participants are engaged in, the tenor is the participants, and the mode what the participants are expecting the language to do for them in a certain situation. As for guessing meaning of a word from textual context, the analyses of those features stand for an invaluable strategy for learners to encode the message given in a specific text. As a strategy which is frequently suggested, guessing from textual context takes its place in the taxonomy with 74% for its use, and 73% for its being helpful.

2.6.1.1.1.2 Discovery-Social Strategies

Ask teacher for paraphrase or synonym of new word: Social strategies are generally considered as Consolidation Strategies. They can be defined as the strategies which entail cooperation with other learners, the teacher or speakers of the L2 (Takac, 2008, p. 54). Once heard, such cooperation is naturally attributed to the reinforcement of knowledge rather than discovery. Rubin (1987), as an instance, agrees that these strategies put learners in an environment where practicing is possible and they do not affect learning directly. Oxford opposes this idea (1990, p 145) saying asking questions helps learners encourage their conversation partners to provide larger quantities of “input” in the target language. Therefore, asking teacher for paraphrase or synonym of new word may provide further input to be processed. In addition, it may also contribute to the Communication Strategies (Dörnyei, 1995) between teachers and learners.

Effective paraphrasing, both in written and spoken form, is widely believed to be an art and is usually confused with summary (Sue, 2004). It is also different from definition, so when asked, teachers do not, or at least must not, pretend as if they were reading a dictionary definition. The focal point should be on how to reflect a better framework in terms of the target vocabulary. It is also not uncommon to come across a foreign language classroom in which the teacher facilitates the vocabulary instruction through providing synonyms of words. That is quite reasonable in that synonymy is closely bound to everyday living and cannot be well explained except in connection with it (Fess, 1938, p. 347). Another point to be underlined in terms of synonyms is that although a synonym may generally be understood as a word in a similar or the same meaning with another word, cognitive synonyms, or synsets (Fellbaum, 1998) may mean any of the related words in a certain schema. Either with the former meaning or as synsets, synonyms definitely help learners as a discovery strategy as well as paraphrasing. The rate of its use in the taxonomy is 42%, whereas its helpfulness is 86%.

Ask teacher for an L1 translation: Translation in foreign language classrooms are usually related to grammar translation method, whereas it can also function as a significant vocabulary learning strategy. Taking it into consideration, Hummel (2010) compared three different to find out if the direction of translation matters. The tasks in her investigation were: (1) L1 to L2 translation; (2) L2 to L1 translation; and (3) a rote-

copying task. The results indicated a significant short-term lexical recall following all three conditions.

The use of L1 in many EFL classrooms are either not welcomed or completely forbidden. In fact, studies highlight the undeniable role of the mother tongue when used in an appropriate manner. Asiyaban and Bagheri (2012), as an instance, carried out a study in which the experimental groups were taught 20 English words using their L1 translations while the control groups received just their original definitions in English. After the instructions, all groups were tested using a test on “free active vocabulary”, which stands for the active use of vocabulary in authentic situations. The students’ grades from the test revealed that the treatment group better activated the target vocabulary in authentic context. L1 translation of the target vocabulary may work fine since learners also activate the related words. That is to say, the related words of any single word are, no doubt, almost always universal to all languages. The relationship between the words *glass* and *bottle* are true in both Turkish and English, or in German. Therefore, L1 interference may also contribute to the mental lexicon in terms of its schematic structure. Tagashira, Kida, and Yuko (2010) studied how L1 interference may contribute to L2 antonymy learning and concluded that the degree of interference in learning L2 antonymous pairs differs; depending upon the differences in the familiarity with the L1 translated words in the L2 word pairs. It can thus be said that the acquaintance with the LSRs of L1 words may influence the L2 vocabulary competence as well.

Asking teacher for L1 translation of the target vocabulary may not be a strategy with a privilege. That is to say, it may be used as a follow-up strategy for other Discovery Strategies. The percentages provided in Schmitt’s taxonomy confirm this view as the participants evaluated its use as 45% and its helpfulness as 61%.

Ask teacher for a sentence including the new word: Using merely dictionaries is what many learners do regardless of the example sentences provided. It may not respond to, say, cultural background of the target population and lexicographers cannot be blamed for this reason as their product is normally planned to serve for a universal population. Corpora, on the other hand, can be used to provide example contexts for learners. Still, probably the most practical way of obtaining sentences which include recently learned words are asking teachers for a sentence including these words.

Zhang (2009) found out in his study that using example sentences in vocabulary learning promotes learners' vocabulary learning and retention. As for an example,

sentence manipulation activities may also ensure the use of these words (Cudd and Roberts, 1993, 346). Providing example sentences, teachers can also guide learners to guess the unfamiliar words (Venable, 2003, p.252). As provided in Schmitt's taxonomy, asking teacher for a sentence including the new word is not much of a popular strategy with a usage of 24%. On the contrary, its users reckon it as a helpful strategy with a percentage of 78%.

2.6.1.1.2 Strategies for Consolidating a Word once it has been Encountered

The strategies under this heading are used for consolidating vocabulary being exposed and was already discovered. They are especially used to convert input into intake.

2.6.1.1.2.1 Consolidation-Social Strategies

Teacher checks students' flash cards or word lists for accuracy: More than anything, learning with flash cards is fun for most learners (Marbella, 1994). However, this is not the only advantage they provide. First of all, students can work only with the words that they really need to learn, and even only the act of making flash cards will help them learn a lot of the words (Dear Teacher, 2000). Displaying the words in flash cards also help learners view each target word separately and they can better manage learning. Cards can also be manipulated, which increases student involvement (Nakashioya, 1992, p. 690).

Word lists are another type of tangible materials which is often used in language classrooms. Despite their frequent use, their fruitfulness is questionable especially with the advances in digital world. The findings in Nakata's study (2008, p. 3) has demonstrated the superiority of computers over lists, the limited advantage of word cards over lists, and no statistically significant difference between computers and cards. Coming back to the taxonomy of vocabulary learning strategies, it is seen that the participants viewed the use of teacher's checking students' flash cards and word lists for accuracy as 3% and its helpfulness as 39%.

Interact with native speakers: Learning a language cannot be viewed separately from its culture and its native speakers are the representatives not only of this language but also its culture in nonnative environments. As is the case, institutes must provide local opportunities for students to engage, interact, and feel connected to native

language and thus its culture (Chamberlin-Quinlisk, 2010). The number of teaching assistants of English language is increasing with pace today with this respect.

The only possibility to be exposed to a target language is not in person indeed. Other means of communication can also be used such as telephone conversations or e-mails with native speakers as they also provide natural contact situations (Holtzer, 2010). Synchronous computer-mediated communication is another utility due to its simultaneous structure (Baker, 2006). The strategy has no indication in Schmitt's taxonomy probably because of the lack of such opportunities in the target population of that study, if not the inconvenience of the 1990s when compared to our time.

Study and practice meaning in a group: The instruction given in foreign language classrooms exploits group work probably more than most other classes. When a teacher aims to organize students for a vocabulary learning activity through their interaction in clusters, there are several ways to do it. One of the most commonly applied one is pair work while another is small group work.

In her concordant study, Dobao (2014) investigated their significance and concluded that small group interaction resulted in significantly more instances of L2 vocabulary learning than pair interaction. In a parallel study, Huong (2006) concluded that students, no matter if "assisted" by the teacher or not, learned new words and the group discussions helped them recall and remember English words. In any kind of cluster, L1 use seems to be one of the most bothering issues that teachers concern. That is because it is usually blur what students are discussing using L1. Storch and Aldosari (2010) aimed at finding an answer for it and theorized the main use of their samples as the purpose of task management and to facilitate deliberations over vocabulary. As was stated in the above lines related to L1 use, it may be quite facilitating when used reasonably. The findings stated in Schmitt's taxonomy also indicated that the participants there evaluated the use of this strategy as 30% while its helpfulness as 51%.

2.6.1.1.2.2 Consolidation-Cognitive Strategies

Written Repetition: Repetition has always been used very frequently as a learning strategy. It is quite popular as "rote learning" and known to be learning which does not necessitate understanding, but is undertaken systematically and mechanistically, usually through repetition (Wallace, 2009). Certain contexts are claimed to be more open to memorization through repetition (Colman, 2009) as a

strategy for learning. For example, it is commonly applied in religious practice due to the view that it is a viable solution as an educational method (Smelley and Joel, 2013).

Vocabulary learning gets one of the bigger slices from repetition strategies in general. For instance, Chinese learners widely accept it as a successful consolidation strategy necessary for success (Qing, 2012). When the issue is written repetition, it is not assumed to be among the other cognitive strategies which facilitate text generation (Sankary, 2013). However, it is at least known to be quite useful as an aid in spelling improvement (Sandberg, 1955). Not surprisingly due to the fact that the background of many language instructional environment is still based on mechanical practice, written repetition is listed Schmitt's taxonomy with a use of 76% and helpfulness of 91%.

Flash Cards: Relevant information towards flash cards was provided under a Consolidation-Social Strategy above. However, it handled the influence of teacher's checking student flash cards as their own products. Such cards may also contribute to foreign language students' cognitive system. Wissman, Rawson, and Pyc (2012) asked language learners how and when they use flashcards. The findings revealed that 82,9 % used cards for vocabulary learning, which is an outstanding amount. Furthermore, 60,5% acknowledged that their use help memorizing. Still, 60% of the participants regard it as not helpful, 35% not useful, and 5% did not need to study using flash cards. Consistent results are given in Schmitt's taxonomy with a use frequency of 25% and helpfulness of 65%.

Use the vocabulary section in your textbook: There is not a unique set of vocabulary list to be used in textbooks, whereas the writers generally follow the suggestions provided by Common European Framework of Reference for Languages, or CEFR (2001). These suggestions point at certain standards for each level and thus the writers can avoid confusion what to include and what not to at certain levels. In fact, lexicographers do use marks indicating at which level certain words, or even their senses, should be taught or learned.

Research after CEFR viewed vocabulary as an important quality to be used while selecting the right textbook for any specific purpose. As an instance, the accommodation of longer lexical items may be more influential in a certain field than the others (Hsu, 2006), or repetition of collocations may be needed in certain educational contexts than in the others (Wang, 2007). Therefore, how a textbook handles the vocabulary sections started to be a matter more than ever been. Additionally, how lexical components are distributed in these books is important as

well. The use of the vocabulary sections in such meticulously planned textbooks should be for the good of EFL learners. The strategy takes its place in the taxonomy with a use rate of 48% and helpfulness of 76%.

2.6.1.1.2.3 Consolidation-Metacognitive Strategies

Continue to study word over time: As was discussed in the previous sections of this study, episodic and semantic memory systems are distinct from the others in many ways. One of these differences is that retrieving a subset of previously studied items can cause later forgetting of the nonretrieved material, which is called Retrieval-induced forgetting (RIF) (Spitzer and Bäuml, 2009, p. 286). As for an illustration, if a word is studied again after some time so as to be remembered, it may end up with the deletion of other words in the case of their nonretrieval. As a result, the practice of vocabulary which can be considered as important for learners sounds to be an indispensable strategy.

The relationship between practice and forgetting is quite commonly attributed to *contextual fluctuation*. According to this theory, each opportunity for practice results in an encoding of stimulus and its context. However, the context of encoding fluctuates with the passage of time. As a consequence, learners vocabulary practice over time may help reduce the impact of fluctuation. Almost half of the participants (45%) in Schmitt's taxonomy seem to use this strategy, and 87% of them accept it as a helpful strategy.

Use English-language media: Semantic webs and their use in human cognition system are at the core of this study. These networks are also the basic structure on which Web3.0 is constructed. Considering the role of media, especially the social media, in Web 3.0, a strong tie between language education and media is inevitable. Moreover, lexemes are undeniably at the heart of semantic webs and thus of language learning as well as media.

With this in mind, Maglic (2007) suggested to improve the quality of media education in ELT classrooms. By this way, learners perform some sort of informal learning of English through activities such as social networking, downloading films and TV series and listening to music on demand (Socket, 2012). It also adds up to students' level of commitment to the study of English (MacLennan, 1991). The improvement is especially clear in vocabulary knowledge of media-user learners (Sim and Pop, 2014).

The use of metacognitive strategies has somehow been underrated until recent couple of decades. This situation is pretty obvious in Schmitt's taxonomy in that five strategies were provided in the inventory in total, and three of them have no quantitative feedback as they were added later on. The use of English-language media is among these three. Considering the advancement in media and communication since 1997, in which the strategy categorization was accumulated, recently held investigations may reveal better statistical results towards its use and helpfulness.

Testing oneself with word tests: A noteworthy question is whether self-testing should be handled as a strategy to diagnose learning or improve learning. Contrary to the common belief, self-testing is motivated by a desire to diagnose learning rather than a desire to improve learning (Kornell and Son, 2009). That is, learners test their skills to find out how to learn, but not to initialize to gain further linguistic knowledge.

Some language skills are more suitable for the conduction of self-assessment, and vocabulary retention is among them. As for Janulevičienė and Kavaliauskienė (2007), self-assessment raises learner awareness of language use in terms of vocabulary and leads to developing learner responsibility and autonomy. It can be viewed from a different perspective as a reflection of reduced controller role of teachers, which results in much student activation also in vocabulary evaluation and assessment. Still, it does not have any statistical evidence in the taxonomy of vocabulary learning strategies.

2.6.1.1.2.4. Semantic Mapping as a Memory Strategy

A crucial issue to be dealt with at firsthand is the discrimination of memory strategies from memorization strategies since it bears a possibility to be confused. Memory strategies are commonly busy with mnemonic, any device for aiding the memory (Nolen, 2014). For this reason, the principle is to create in the mind an artificial structure that incorporates unfamiliar ideas or, especially, a series of dissociated ideas that by themselves are difficult to remember. Therefore, memorization can only be a subcategory of mnemonics.

Semantic mapping, as the core strategy of this current research, is not a memorization strategy; rather it is a memory strategy. They can be regarded as a form of mind mapping, which links information with its inter-related branching and is suggested to support a deeper level of thinking (Zipp and Maher, 2013, p. 22). Semantic maps are often used as graphic organizers that help students analyze their reading or

develop their vocabulary (Wolfinger, 2006). They contribute to the patterns of words in the schemata which consist of LSRs. The existence of special memory enhancing patterns for words drew the attention of researchers at least several decades ago (Belleza, 1983). They may only facilitate memorization rather than being regarded as a way of memorization completely. On the other hand, rote memorization can be given as an example for memorization. Memory strategies such as semantic mapping generally require hard work and detailed preparation, whereas memorization strategies depend basically on the time to be spent. The investigation of Khoii and Sharififar (2013) aimed at the illustration of this situation and could not find out a significant difference between the multiple choice vocabulary exams results of the participants who were instructed using rote memorization and those trained using semantic mapping.

Still, their finding does not necessarily mean to be an overall assumption. Comparing the efficiency of two strategies requires more than measuring the participants' performance that occurs with practice. That is to say, there are further factors to be considered such as time delay; spacing effect, which was explained in the above lines before; the interaction of spacing with retention; and the interaction of spacing with practice (Pavlik and Anderson, 2014, p. 567). It is worth analyzing how these strategies may work after a while when it can be said that the input must have been taken into LTM. Meanwhile, semantic memory may delete that piece of information in order to make room for novel input.

Semantic maps have been used for various purposes so far; from the analysis of the multifunctionality of grammatical morphemes (Lujan, 2010) to the determining of cross-linguistic multifunctionality patterns (Cristofaro, 2010). However, there is pretty limited literature over what to use on a map when the purpose is learning vocabulary. As a response to this query, Cysouw (2010) argues that a semantic map is a visualization of a metric on contexts sampled to represent a domain of meaning. Therefore, the schema presented in a semantic map for the purpose of vocabulary learning should include semantically related notions. Oxford's (1990) suggestion for using related words, or lexical semantic relation in this current study, is in harmony with this view.

CHAPTER III

METHODOLOGY

3.1. Introduction

This chapter is intended to provide an introduction to the design of the current research. In this manner, the rationale behind adopting a mixed research method will be mentioned. Then come the details about sampling and the participants. Following lines will cover the procedures followed throughout the experimental phase and in the descriptive phase, and the tools used for data collection. A final point to be handled is the techniques applied for the analyses of the data obtained.

3.2. Research Design

Since this research aims to investigate how the implementation of a fine-tuned vocabulary learning strategy works on a certain stratum of EFL learners, the design conducted in this research can be viewed as quasi-experimental. Such studies are based on quantitative data to a large extent; still and all, “to establish firm cause-effect relationships is surprisingly difficult because in real life nothing happens in isolation and it is hard to disentangle the interferences of various relation factors” (Dörnyei, 2011, 115).

A pragmatic perspective thereupon which provides not only one system of philosophy and reality can provide basis for “what works” as mentioned in Cresswell (2003, 12). Therefore, a design based on mixed methods is usually worth applying. In other words, a hybrid collection of quantitative and qualitative data, widely-known as triangulation, is preferable. Such a design can combine quantitative and qualitative research components when successive tests are conducted and various data is collected. By doing so, it intended to improve the validity of the study.

3.3. Research Population and Sampling

The target population of this research is learners of English as a foreign language (EFL) and the accessible population is all the preparatory students of English as a foreign language in the School of Foreign Languages in the University of Gaziantep. As the medium language of instruction is English in the faculties of engineering and

medicine in this university, the newcomer students of the mentioned faculties must take an exception exam which is prepared in the shed of First Certificate in English (FCE) exams. Therefore, it is intended to follow a path parallel to the Common European Framework of Reference (CEFR) for languages. Those who are regarded as successful continue in their departments without a preparatory education of EFL. Another criterion to be exempted from that language education is having a satisfactory score from the foreign language exam conducted in Turkey, namely YDS, or from an international exam such as FCE, TOEFL and IELTS. The minimum required grades from these exams are pre-determined by the university senate, though very few students can receive a sufficient score and acknowledge it to the school.

On the other hand, those who cannot attain enough scores to be assumed as successful from any of these exams are subject to a two-semester EFL education in the school. They are clustered into three different levels referred in the CEFR (Council of Europe, 2001) using their scores from the exemption exams for the second time: A1 (Breakthrough), A2 (Waystage), B1 (Threshold). Each level proceeds to the next level corresponding to the syllabus, and it is based on the coursebooks taught, namely Face2Face series of Cambridge. All the prep students are expected to reach at least B1 level in order to take the final exam of the program, which is as significant to pass the class as the whole exams throughout the two semesters.

As is the case, cluster sampling was the method to determine the participant group to the treatment, and an A1 level group was selected randomly. According to the curriculum design of the levels, the groups in this level start the second semester in A2 level and continue the following couple of months in B1 level. In other words, they study in all three levels at the very beginning of the educational year, and spend a great deal of the treatment process in the medium level. They finalize the prep course in B2 level and take a final exam. The second semester is allocated on purpose in order to reduce impact of the external factors such as accommodation and adaptation to the school. Another logic behind the schedule is to make room for the pilot study and accumulation of the vocabulary studied by the participants and to be asked in the pre-test session.

There were also two other clusters of participants for the control groups in this investigation. Dörnyei (2011) criticizes novice researchers for often speculating that it is enough to take a learner group, administer the treatment (say a strategy training), and if the difference between pre-test and post-test is significant, then the treatment has

obviously worked. Meanwhile, he points especially at those who aim to conduct true experimental research through random sampling in educational contexts. An EFL learners group and a native speaker of English group form the control mechanism of this research to be statistically compared with the treatment group accordingly.

The first control group is of the same stratum with the treatment group; they were the prep students at the same school and level. This group was picked randomly among many other alternatives as they would not receive a treatment. They follow the same pacing schedule, study the same syllabus and almost all the other facets are the same except from their instructors. The purpose of having a control group from the accessible population is to observe any distinctive features obtained by the treatment group starting with the treatment.

The latter control group, on the other hand, consists of the native speakers of English who are from academic context. The majority of the participants study at Southern Illinois University while the rest are at the University of Gaziantep within the scope of Fulbright Foreign Language Teaching Assistant Program. By the comparison of a non-native treatment group with a control group whose mother tongue is English, it is intended to observe how closer the target population can come through this strategy training, if any. The data related to the all three participant groups are summarized in Table 1 below.

Table 1

The Participant Clusters of the Research

Group title	Level of English	Number of the Participants
L2 treatment	A2 (at the beginning of the treatment), B2 (in the end)	20
L2 control	A2 (at the beginning of the treatment), B2 (in the end)	20
Native control	Native speaker of English	20

It can be seen that all the groups are well-balanced in terms of the number of participants. Control groups were investigated in terms of the data collection

instruments given in the pre-test and post-test sessions. Otherwise, they did not receive any specific treatment towards EFL learning meanwhile. Furthermore, all the participants contributed in this study were assured to take their parts on their freewill: any contribution from participants of the treatment group was accepted as academic performance and rewarded in this manner. Besides, their eagerness was propelled automatically as their success in the vocabulary sections of the exams evidently increased. The non-native control group, on the other hand, kindly accepted to be a part of the pre-tests and post-tests knowing any further vocabulary exercise would be of their benefit, thanks to their main course instructor's stimulating manner as well. The other control group of native speakers was merely asked if they want to take the pre-test and post-test that they were intended to be included and voluntarily accepted without any hesitation like the other groups.

3.4. Data Collection Instruments

Based on the purposes of the research and its questions, the instruments used to collect the relevant data are twofold: (1) the instruments of the experimental phase, which also form the quantitative aspect of the whole process, and (2) the instrument of the descriptive phase, which stands for the written responses to the questions from the treatment group right after the treatment and its assessments were over. In contrast with the latter, the quantitative aspect seeks the answers for three different queries, and thus is collected through three different types of vocabulary size tests. The details about the instruments are as in the following lines.

3.4.1. The Data Collection Instruments of the Experimental Phase

The instruments used for the queries handled in the experimental phase were based on three sets of vocabulary tests. The items in these tests were all based on multiple choice formats. Vocabulary tests usually have two goals in general: (1) they either measure the vocabulary known, or (2) the vocabulary learned. As a result, the first and the second tests below are for the vocabulary learned while the third is for those known. Any of the tests are conducted in a different time and volume. The first and the final types of the tests which will be explained below is conducted as pre-test and post-test while the progress tests, as their names reveal, were carried out throughout training.

3.4.1.1. The Awareness Tests of LSRs

The tests prepared in this way are called as “awareness” tests in this study since the purpose is to observe how aware the test-takers are towards the LSRs of the words that they have learned. A number of distinguished vocabulary tests were inspired while preparing the Awareness Pre-test and Post-test. A prominent example of those comes from Schmitt et al. (2001). Their Vocabulary Levels Tests are distinguished means to measure the LSRs of the words. An example question for their style is as the one provided in Table 2 below with its correct answers.

Table 2

Sample Question from the Vocabulary Levels Test of Schmitt et al.

1	business	
2	clock	_____ 6 _____ part of a house
3	horse	_____ 3 _____ animal with four legs
4	pencil	_____ 4 _____ something used for writing
5	shoe	
6	wall	

The Vocabulary Levels Test aims to give a frequency profile of a learner's vocabulary Schmitt, Schmitt, & Clapham (2001). Such a profile is determined through the levels of the vocabulary tests. The tests are classified into five categories: (1) the 2,000 word level, (2) the 3,000 word level, (3) the 5,000 word level, (4) the 10,000 word level, and finally (5) the academic vocabulary. A final point is that the instruction states the test-takers do not have to find a meaning for every word given, and directs them not to guess if they have no idea.

Another influential test type was Nation's Vocabulary Size Test. His tests bear similarities with the Vocabulary Levels Tests, though with some major variations in details as well such as Nation's test's having a short but practical stem sentence while Schmitt's test includes several words to be matched. The following sample in Table 3 is from his online test (2014).

Table 3

Sample Question from Nation's Vocabulary Size Test

Now:

Please do it **now**.

- ☐ today
- ☐ at this time
- ☐ again
- ☐ soon
- ☐ I don't know

The Vocabulary Size Tests of Nation also have some variations within themselves. As an instance, his online test format includes “I don't know” as a final option for indecisive test-takers or for those who do not have an idea. On the other hand, his paper-based tests, which are available online for download, do not include this vital option. Those downloadable tests are either in monolingual form, or in bilingual; English together with either of Korean, Japanese, Mandarin, Russian or Vietnamese. Furthermore, those monolingual are also in two forms: (1) 14,000 vocabulary size test, and (2) 20,000 vocabulary size test with version A and version B.

Last but not least, the vocabulary drills of the book “the Words You Need” (Rudzka, Channell, Putseys, & Ostyn, 1987), which is quite popular with the respect of word relatedness, were still another resource of admiration for the preparation of the Awareness Tests of this study. In this book, some of the words share the same qualities, and thus have the same grounds. A typical example is as in Figure 2.

	man	face	furniture	building	surroundings	blocks of flats and car parks
ugly	+	+	+	+	+	(+)
unsightly				+	+	+

Figure 2. Sample question from the Words You Need

As previously stated, the Awareness Tests were conducted as pre-test and post-test and the questions asked in these tests were different from one another. Still, they were prepared in the same manner. It was explained while handling the sampling that the participants of the treatment group started their EFL education in the school as an A1 group and continued as A2 until the pre-test was practiced. Then the pre-test consisted of the questions which were prepared considering the words that they had already learned by that time. The accumulation of the words did not cause any inconvenience since both the interactive software of the coursebook provided it, and also the instructors in the school had already published a word list in the website of the school with limited examples and synonym-antonym forms too. Then the test hereby was a vocabulary exam to seek the words learned rather than the words known. A standard example from the pre-test is given in Table 4.

Table 4

Sample Question from the LSRs Awareness Pre-test

Alice fell into the lake, but her friend _____ her from drowning.

- A) Only “protected” is appropriate.
 - B) Only “saved is appropriate.
 - C) Both “protected” and “saved” are appropriate.
 - D) I am not sure.
-

The exam covered 20 questions in total and the stem sentences of all the questions were adapted from three basic resources: (1) Corpus of Contemporary American English (COCA), (2) Collins WordBanks Online, or (3) Cambridge Advanced Learner’s Dictionary. When the issue is the options, the influence of the question types stated in the above lines can be seen. In each question, two words are tested; however, a third option is there to weigh the similarities or the differences of the words in terms of lexical semantic grounds as Rudzka et al. implemented in their book. Yet a final option was provided as in Nation’s test –and as also urged in Schmitt’s test– to lead the learners avoid giving answer when they do not know or are not sure.

The post-test was prepared in the same vein but with different vocabulary to be used. This was just because the curriculum maintained and the participants continued learning new words in new levels. When the treatment started right after the pre-test,

they were already at A2 level and they continued in B1 later on. Therefore, the post-test would be prepared hands in hands with the curriculum since that was a test of vocabulary learned. A sample question from the post-test is depicted in Table 5.

Table 5

Sample Question from the LSRs Awareness Post-test

The volunteers drove all the way here from Mississippi, just to _____ free food, water, and gas to anyone who needed them.

- A) Only “give away” is appropriate.
 - B) Only “put away” is appropriate.
 - C) Both “give away” and “put away” are appropriate.
 - D) I am not sure.
-

Although every detail of the questions was carefully dealt with, it is always risky to conduct such tests directly in terms of their validity and reliability issues. It is a well-known issue that triangulation of qualitative analysis and quantitative analysis as in this research is initially for a strong validity. However, it may depend on the correct choices of data analysis tools hands in hands with the purpose of the study. Therefore, peer checking was performed for the content validity of this present test type. The contributors were a native speaker of English who used to work in the School of Foreign Languages as an FLT assistant, three non-native instructors at the same school and, finally, a lecturer who holds a PhD degree in TEFL and whose specialization is vocabulary testing. Although the stem sentences of the questions were from distinguished resources as previously stated, those peers especially assisted in terms of the evaluation of relevant option choices in each question and minor changes were done thanks to their feedback.

Besides the validity, the internal consistency of the test items should be assured for the reliability of the assessment. To do so, the test was executed on a pilot group of 20 A2 level students. The result is as in Table 6.

Table 6

The Reliability Statistics for the Internal Consistency of the LSRs Awareness Pre-test

Cronbach's Alpha	N of Items
.772	20

Dörnyei (2011, p. 207) suggests that L2 researchers often cannot use large scales due to the complex nature of the field. Still, the reliability coefficients of such studies should exceed .70. As seen in Table 6, the reliability coefficient of the Awareness Pre-test is significantly higher than this level ($\alpha > .70$).

The post-test was started right after the treatment. The validity for this test was also obtained through following the same procedure as in the pre-test. No remarkable change was observed based on the views. Conversely, the format of the test was admired especially by the instructors as was in the pre-test. Moreover, another way of validity evaluation was the respondent feedback after the pilot test and the pre-test. The students had never experienced this format of vocabulary testing before, but they had extremely positive attitudes towards it. In support of these indications, the reliability coefficient of the Awareness Post-test is given in Table 7 below.

Table 7

The Reliability Statistics for the Internal Consistency of the LSRs Awareness Post-test

Cronbach's Alpha	N of Items
.942	20

It is seen in the Cronbach's Reliability statistics, which is based on the responses from the pilot group of 20 A2 level students, that the post-test is significantly consistent internally ($\alpha > .70$). Therefore, both of the tests can be accepted to be valid and reliable to be conducted to assess the LSRs Awareness of the participants.

3.4.1.2. The Progress Tests of LSRs

As the treatment period started, a series of evaluation tests systematically followed it. Those tests were applied periodically, and thus form the basis of the

successive structure of the research. Such a structure was intended to observe any change in the vocabulary learned depending on the types of supplementary strategies used in addition to the semantic mapping. If there was any significant fluctuation in a certain test, then it would mean that the supplementary strategies of that specific period might have had some impact on the vocabulary studies of the participants.

The organization of the schedule will be mentioned in detail in the following lines, but, briefly to say, each of these progress tests was conducted at the end of three-unit sessions. That is to say, the participants were tested in every three units and five times in total.

Taking this brief information about their schedule, the nature of these tests can be described as more practical in terms of testing the LSRs. In other words, it was barely on testing how well the students could relate the words semantically without a detailed question stem as in the Awareness Tests. The questions were given in plain tables so that the respondents were just to tick the relevant options in terms of semantic relations. A sample question is given below in Table 8.

Table 8

Sample Question from one of the Progress Tests of LSRs

	Die	Live	Endure
A) Dye			
B) Survive			
C) Both A and B			
D) I am not sure			

The type of the question resembles those especially in the Words You Need. That is to say, the main purpose of such a question type is relating words in terms of their semantic commonalities. On the other hand, the reference words on the top are limited and options are parallel to the structure in the Awareness Tests. The reference words were carefully chosen from the LSRs. What is more, they were aimed to be from the ones given during their semantic mapping in the treatment. The test-takers were required to tick the junctions of the options with the related reference words, and then decide which option has more commonalities than the other, if there is any. When both

options have the same number of junctions, or relations, they go for option C. They were also kindly requested to pick up option D when they are not certain.

Another point worth mentioning is the scope of the vocabulary used in each test. Considering the variation in the vocabulary size in each session, every test consists of 20 questions, which means 40 words to be tested since there were two words given in the options in every single question. The words in each question were classified in terms of their being in the same part of speech. As stated before, the words utilized in this study were all content words. However, the purpose of these tests was not to measure the learners' ability to sort out the parts of speech. For this reason, the words as the options of each single question are of the same part of speech.

In addition to the words used as the options of the questions, the remaining words which were studied in the treatment but were not used in the options of the questions were put into use as reference words as much as possible. While determining which word should be used as an option to be picked up or as in the stem sentence of the question, the frequency rates of these words in the Corpus of Contemporary American English were considered. By doing so, this series of tests could be covered almost all the words studied throughout the whole procedure in advance; the more frequent ones in the corpus were as the options of the questions.

3.4.1.3. The Vocabulary Size Tests

The vocabulary tests to predict the capacity of the vocabulary competence of individual second language learners have outnumbered many other types of language tests since the beginning of the 21st century. As stated before, such tests are basically to evaluate the vocabulary known, rather than the vocabulary learned. Some of those tests are more popular than the others. As a result of their global fame, they are often revised, edited and tested in terms of their validity and reliability.

As an instance, Paul Meara's Yes/No test is a simple but practical test of vocabulary known. Norbert Schmitt is yet another specialist with his distinguished Vocabulary Levels Tests. Tom Cobb is, on the other hand, well-known with his website which is a home of a great deal of vocabulary tests with this respect. Among all these invaluable options, Nation's Vocabulary Size Test was used in this current research for a number of reasons as stated below:

First of all, the test was going to be used to evaluate the vocabulary size of the participants not only before the treatment as pre-test, but also afterwards as post-test.

Therefore, it would be better to use two different tests with a proven similarity in terms of its style. At this point, Nation's 20,000 words level monolingual tests were relevant without hesitation as it has two versions: version A and version B. The reliability analysis of these tests were quite significant; Rasch reliability measure was around .96 (Nation, 2012).

Next, the stem sentences of the questions were not complicated and only the most common 500 words in English were used, which makes the test more preferable to measure the vocabulary known when compared to the others stated above. They are not complicated because the test aims to measure decontextualized receptive knowledge of the words. There were four options in each question and 100 questions in total; each correct choice means 200 points and thus 20,000 words level in total. Moreover, the words in the options include merely content words without proper nouns, transparent compounds, and marginal words and abbreviations.

Finally, the test was prepared using British National Corpus (BNC) for the frequency levels of the word family lists. The Awareness Tests were also adapted from the same resource. However, it is not intended to provide impeccable scores towards one's vocabulary size because there are not enough items at each level. For this reason, the results can only indicate overall sizes of the participants.

The test has a number of variations in terms of the vocabulary size; however, the number of the questions in 20,000 words level is logical to be conducted for the participants as it includes 100 questions rather than 140 as in 14,000 words level. Moreover, there is an extra option as "I don't know" in its online form; however, it was not used in the paper-based forms because "such an option discourages informed guessing" (Nation, 2012). A supportive analysis came from Zhang (2013) towards the influence of this option. Three versions of the tests were given to three different groups: Version 1 included only four options in each question, Version 2 included "I don't know" as a fifth option, and, finally, Version 3 included not only "I don't know", but also a penalty. That is to say, if the students do not choose "I don't know" but an incorrect option, this version penalizes the students in terms of their scores in this exam. As can be foreseen, the second and the last versions demotivate student guesses while the first version welcomes partial knowledge without having a shortcut answer as "I don't know", or a penalty.

On the other hand, Zhang (2013) does not totally refuse the use of "I don't know" option and emphasizes that if the VST is intended to avoid random guesses as

much as possible or if precise knowledge is the only concern, one may consider including the I don't know option. From this point of view, it would be better to remember the previous two types of tests conducted in this study, which included this option. The logic behind using "I don't know" in those tests was twofold: (1) that there were LSRs are precise reference in their questions, and (2) that those tests were towards the vocabulary learned rather than the vocabulary known, which means that the interference of any partial knowledge might bother to some extent. Therefore, this option is not used in the Vocabulary Size Test for seeking the vocabulary known while it did work as a suspension for partial guesses.

3.4.2. The Data Collection Instrument of the Descriptive Phase

Rather empiricist investigations often focus merely on scientific method, and thus only use quantitative data. Doing so may result in a failure of the identification of the nature in which the obtained data are that way but not another. Social constructivism, on the other hand, regards knowledge as "understanding of the world in which they live and work" (Creswell, 2003). The researchers from this point of view usually get benefit from social inquiry and interpret the feedback attained. In order to prevent the indications collected in this current research from being solely composed of some numerical means, a qualitative facet was considered to assist the quantitative data for a better view. Therefore, the qualitative data collection instrument used for this purpose is described next.

3.4.2.1. Open-ended Survey towards the Mapping of LSRs

A brief but practical survey of four open-ended questions has formed the basis of the qualitative stage of the data collection for the triangulation. Crotty (1998) asserts that qualitative researchers tend to use open-ended questions so that participants can express their views. These four items are as in Table 9.

Table 9

The Survey Items of the Descriptive Phase towards the Mapping of LSRs

-
- (1) If our mapping of LSRs study was of any help for you, in which way or ways did it contribute to you?
- (2) Have you experienced any treatment-based inconvenience throughout the process?
- (3) Has there been any acquisition which would only be obtained through mapping of LSRs?
- (4) What is your overall evaluation related to our treatment towards the mapping of LSRs?
-

The first question was aimed to clarify if the treatment had any contribution in advance. The respondents were also requested to declare what they gained through it. Such a survey without seeking would-be obstacles might be far from a realistic criticism; therefore, the second item was directed to reflect any discrepancy. No matter how many positive feedbacks can be obtained, any negative turn should be welcomed in such inquiries as they help the researcher improve the perspective of the treatments. Still a further question was provided to investigate if there was any point which was acquired by the participants and that they believe would only be possible to be obtained through the treatment of this study. The feedback obtained from this very question bears a key role to determine the direction of the EFL learners' attitudes towards the study as it reflects how they regard its unique nature. The final question is a conclusive one and is as to the point as possible. It was included to assure the previous responds.

3.5. Procedure

The current session of the research schedule was planned for conducting the treatment. The treatment was based on teaching new vocabulary to an EFL group which started the academic year in A1 level, was A2 level at the beginning of the second semester and the treatment, and, later on, continued in B2 level till the end of the prep education. This preparatory class consisted of 20 students in a Turkish university and they participated to a series of vocabulary practice through mapping of LSRs in time. It lasted about 16 weeks and included 15 units from their coursebook, namely Face2Face Pre-Intermediate (three units), and Face2Face Intermediate (11 units). However, the whole procedure cannot be limited with this duration. Rather, it can be classified in three stages.

The first stage is before the treatment and it covers the pre-tests, validity and reliability analyses and the pilot study. Two tests were conducted as the pre-tests in this

study: (1) Nation's Vocabulary Size Test of 20,000 word level; its version A, and (2) an LSRs Awareness Pre-test, which was prepared to be used only in this study since it is based on the word list prepared using the target population's coursebook. The former is known widely as one of the most reliable vocabulary size tests as long as it is conducted in suggested conditions. The students from the treatment group and the non-native participant group were requested to take this test before their semester holiday. Therefore, the vocabulary known by these groups at the end of the first semester, which means before the treatment, was weighed. It was conducted to make a comparison not only between these two groups, but also between their cases before and after the treatment.

When the second semester started, the first thing handled was conducting an LSRs Awareness Pre-test which consisted of 20 vocabulary questions based on the words the students learned in the first semester. These words were approximately 300 words and were accumulated previously by the instructors at the prep school. This corpus of vocabulary items was available online for all the students in the school. Furthermore, the multimedia software of the coursebooks also had a section based on the list of vocabulary in the books, which was also consulted to assure the importance of any vocabulary item. As was previously mentioned, the test included 40 words in the options of the questions, though the statements in the questions often included many other new words as well. As previously stated, the questions were formed using Corpus of Contemporary American English (COCA); especially while choosing the words in the options depending on their word frequency levels, Collins WordBanks Online, and Cambridge Advanced Learners' Dictionary. The test was conducted to a random class of the same level to the treatment group and thus the validity and reliability analyses could be done. The pre-test was also applied for a number of native speakers from various academic environments and to another non-native group of students at the same level and school of the target population to compare the results using One-Way ANOVA. The logic behind this comparison is to see the significance of any difference between the native speakers and the target population, which is an expected result beforehand, and if there is any remarkable difference between the non-native groups of this study, which will be the treatment group while the other is another control group afterwards.

The students of the treatment group had already been introduced to the LSRs before the treatment started in the second semester in a pilot study. These relations were

in two categories: *has-a-relation*, which included the synsets of holonyms and meronyms; and *is-a-relation*, which included the synsets of synonyms, antonyms, metonyms, polysemes, homonyms (including homophones and homographs itself), hyponyms, hyperonyms and troponyms. Despite their potential complexity, these terms did not cause much trouble as they are universal and the students were also provided a manual with definitions as well as example sentences so as not to forget them. During the pilot study, a number of resources to be used in the treatment were presented too. The first of these was Webspirationpro, online software to present categorizations such as mapping. Following this tool, WordNet[®] was mentioned as a database to be used for the categorization of the LSRs. As there are a number of dictionaries and engines based on this database, the students were not intended to be limited with any certain software in this respect. Moreover, the inventory of the synsets and sense relations in this study were derived from this project, so it can be regarded as the backbone for the procedure.

Briefly to say, the first stage served for evaluating the conditions of the participants in terms of their vocabulary competence towards the words that they know and that they learn. Moreover, the practicality of the treatment was tested and analyzed in this stage. The steps are compiled in Table 10.

Table 10

The Steps Followed in the First Stage of the Study

Steps of the First Stage	Purpose	Participants
1. Nation's Vocabulary Size Test (20,000 words level-Version A)	Pre-test for the vocabulary known	i. The L2 treatment group ii. The L2 control group
2. An LSRs Awareness Test	Validity & reliability	i. A random EFL group of the same level as L2 groups ii. The instructors of EFL at the same school
3. An LSRs Awareness Test	Pre-test for the vocabulary learned in the first semester	i. The L2 treatment group ii. Native control group iii. The L2 control group
4. Pilot Study of the Treatment	To practice the fundamentals of the treatment	i. The L2 treatment group

The treatment based on mapping of LSRs started in the second stage following the pilot study. Students were aimed to carry out an individual mapping at first hand, and then a group mapping in the class getting benefit from their personal studies. A vocabulary list was already available on the website of the school. The words in this list were content words from students' coursebooks and were classified unit by unit. The participants were asked to brainstorm regarding the words of currently studied units based on the school curriculum and each week covered approximately one unit according to this curriculum. Their brainstorm was through the analysis of LSRs. As an instance, the word "zone" was in Unit 8, and the students tried to identify its LSRs individually as an assignment. While doing so, they benefitted from their personal world knowledge; that is to say, their own experience. Additionally, they were previously supplied with a template consisting of a number of boxes to fill in (See Appendix III for the template). The box in the center of the template was for students to take their notes on individual brainstorming.

Following individual study, they were asked to contribute in the classroom in the shed of their individual studies. In other words, the lexical semantic data that they composed as an assignment was collected in the classroom at the end of each unit. A new online template was opened at Webspirationpro for every single word. The students were required to share their individual LSRs with the class. In addition to the data obtained from the students, tools like WordNet[®] were consulted, especially in terms of the words that the students did not have enough experience. As enough relations were collected, they were integrated into the online template in relation clusters (See Appendix IV for a sample online template). For example, the word "region" is the hyperonym of "zone" and thus takes place in hyperonym cluster in the template for zone. This online template also provided facilities to embed pictures, videos or sounds as semantic maps commonly have.

Since no vocabulary learning strategy is enough by itself, this strategy of the treatment was supported by some other most common and appropriate strategies selected from Schmitt's taxonomy of vocabulary learning (1997). The other boxes in the template for individual study were aimed to serve for these strategies. To illustrate, the word "zone" was studied in the 11th week, and the boxes were filled with the notes based on the strategies of that week. Table 11 shows the plan of the second stage of this study:

Table 11

The Schedule of the Supplementary Strategies to the Mapping of LSRs in the Second Stage

Week	Discovery Strategies		Consolidation Strategies		
	Determination	Social	Social	Cognitive	Metacognitive
1	*Bilingual dictionary	Ask teacher for a sentence including the new word	Study and practice meaning in a group	Use the vocabulary section in your textbook	Testing oneself with word tests
2	*Check for L1 cognate	Ask teacher for a sentence including the new word	Study and practice meaning in a group	Use the vocabulary section in your textbook	Testing oneself with word tests
3	Guess from textual context	Ask teacher for a sentence including the new word	Study and practice meaning in a group	Use the vocabulary section in your textbook	Testing oneself with word tests
<i>Progress Test 1</i>					
4	Guess from textual context	*Ask teacher for paraphrase or synonym of new word	Study and practice meaning in a group	Use the vocabulary section in your textbook	Testing oneself with word tests
5	Guess from textual context	*Ask teacher for an L1 translation	Study and practice meaning in a group	Use the vocabulary section in your textbook	Testing oneself with word tests
6	Guess from textual context	Ask teacher for a sentence including the new word	Study and practice meaning in a group	Use the vocabulary section in your textbook	Testing oneself with word tests
<i>Progress Test 2</i>					
7	Guess from textual context	Ask teacher for a sentence including the new word	*Teacher checks students' flash cards or word lists for accuracy	Use the vocabulary section in your textbook	Testing oneself with word tests
8	Guess from textual context	Ask teacher for a sentence including the new word	* Interact with native speakers	Use the vocabulary section in your textbook	Testing oneself with word tests
9	Guess from textual context	Ask teacher for a sentence including the new word	Study and practice meaning in a group	Use the vocabulary section in your textbook	Testing oneself with word tests
<i>Progress Test 3</i>					
10NU	Guess from textual context	Ask teacher for a sentence including the new word	Study and practice meaning in a group	*Written Repetition	Testing oneself with word tests

(Table 11 Continued)

11	Guess from textual context	Ask teacher for a sentence including the new word	Study and practice meaning in a group	*Flash Cards	Testing oneself with word tests
12	Guess from textual context	Ask teacher for a sentence including the new word	Study and practice meaning in a group	Use the vocabulary section in your textbook	Testing oneself with word tests
<i>Progress Test 4</i>					
13	Guess from textual context	Ask teacher for a sentence including the new word	Study and practice meaning in a group	Use the vocabulary section in your textbook	*Continue to study word over time
14	Guess from textual context	Ask teacher for a sentence including the new word	Study and practice meaning in a group	Use the vocabulary section in your textbook	* Use English language media
15	Guess from textual context	Ask teacher for a sentence including the new word	Study and practice meaning in a group	Use the vocabulary section in your textbook	Testing oneself with word tests
<i>Progress Test 5</i>					

As illustrated above, there are 15 units to be studied and all the units except from the third and its multiples have different research agendas. That means the third, sixth, ninth, twelfth and fifteenth units have a standard program in addition to mapping of LSRs. The other units have minor differences and these differences are in order to focus on different vocabulary learning strategy categories. In other words, the variation in the Determination Strategies, as an example, used as supplementary strategies for LSRs in the first three units is to see whether they have an influence on the mapping of LSRs or not. To see if the variation of these supportive strategies has an impact or not, a test was given for the students at the end of each three-unit period. After fifteen units and five different sessions of vocabulary strategies, the results from these five mid-tests were compared to see the differences in their contributions.

It was stated on page 61 that each student was required to carry out an individual mapping beforehand, and these are gathered in the classroom as a group activity using Webspirationpro website, which is for the accumulation of the mappings. The website supported online access for the maps outside the classroom as well. The total number of the vocabulary studied was approximately 300 words.

The final stage is based on the post-tests of the experimental phase and the survey of the descriptive phase. AnLSRsAwareness Post-test was prepared at the end of the treatment and was first given to a number of native speakers from academic context again, to an expert who holds his PhD in TEFL, and to another B1 level EFL prep class, too. After getting their feedback in terms of validity and reliability, the test was conducted to the target group. The results were compared with that of the other EFL prep class to see if there was any significant difference. It consists of 20 questions as well, but the questions included new words not only in the options, but also in its root structure. Therefore, the test contained as much new words as possible from the learned vocabulary.

A second post-test, Nation's Vocabulary Size Test again, was supplied for the students. They were provided with the 20,000 words level version B this time, which has the questions with the same type but different contexts. The test results were compared with the pre-test results to see the level of the difference between the words known after the treatment . It was also compared with the control groups' test results to reveal if the same level learners had a significant difference in their vocabulary sizes after the treatment.

Students were also provided a vocabulary learning template to keep the new words in a much more appropriate way. This template helped them keep all the new words as in a student-dictionary concept. As a result, most of the students had their personal student dictionaries at the end of the treatment. A copy of each dictionary was obtained at the end of the whole procedure.

A final remark about the treatment procedure is on qualitative data. Students were requested to respond to an online survey via SurveyMonkey® towards the use of mapping of LSRs when the treatment was over. Their feedbacks were analyzed using NVivo 10 software, which facilitates the analysis of qualitative data. Eventually, the treatment session of the calendar was fulfilled in accordance with the plan. Table 12 may help to see the key points of this third stage at a glance.

Table 12

The Steps Followed in the Third Stage of the Study

Steps of the Third Stage	Purpose	Participants
<i>1. Nation's Vocabulary Size Test (20,000 words level-Version B)</i>	Post-test for the vocabulary known	i. The L2 treatment group ii. The L2 control group
<i>2. An LSRs Awareness Test</i>	Validity & reliability	i. A random EFL group of the same level ii. The Instructors of EFL at the same school iii. A specialist on vocabulary testing
<i>3. An LSRs Awareness Test</i>	Post-test for the vocabulary learned in the first semester	i. The L2 treatment group ii. Native control group iii. The L2 control group
<i>4. An Open-ended Survey</i>	To obtain students' reflection	i. The L2 treatment group

3.6. Overview of the Statistical Techniques Used in the Study

All three types of tests conducted in this research required certain statistical analyses depending on their structure. To start with, Nation's Vocabulary Size Test was applied both as pre-test and post-test for the non-native groups, and the groups were compared in each test using an independent samples t-test. Furthermore, another comparison using paired samples t-test this time was to observe any difference within the pre-test and post-test results of each group.

The Awareness Pre-test and Post-test of LSRs, on the other hand, were taken by all three participant groups. Therefore, one-way ANOVA was used for the comparison of the results. Just as in Nation's test, the pre-test and post-test comparison of each group was also done through paired samples t-test. As for the Progress Tests, they were five successive tests and thus repeated measures ANOVA served for the comparison.

CHAPTER IV

DATA ANALYSIS AND RESULTS

4.1. Introduction

This chapter presents the results of the tests conducted throughout the experimental phase and of the open-ended survey provided after the experimental phase. The former ones are based on quantitative data and were obtained using three different tests in diverse sessions. The first of those tests was to see if the treatment had a significant contribution to the awareness of the participants about the LSRs among the vocabulary they learned. A next set of tests was to evaluate the impact of the other strategy groups over semantic mapping as a memory strategy. A last type of data collection tool is Nation's Vocabulary Size Test, which stands for a distinguished means of instrument to attain data towards the vocabulary known. All the results of this phase were analyzed using SPSS 15.0.

The latter results come from the participants of the treatment in a descriptive form at the end of the experimental procedures. The data handled here in the descriptive phase refers to the qualitative aspect of this research which aims to focus on how the participants approach to the treatment. Their answers for four survey questions were analyzed using NVivo10 and interpreted using the correlation statistics obtained.

4.2. The Results of the Experimental Phase

The experimental phase constitutes the backbone of the findings as it is composed of the data obtained before treatment in terms of pre-tests, a set of progress tests during the treatment, and after the treatment as post-tests. A LSRs Awareness Test and Nation's Vocabulary Size Test were conducted as the pre-tests. Five progress tests were provided during the treatment. Two post-tests in the same vein as the pre-tests followed them all in order to make a number of comparisons.

4.2.1. The LSRs Awareness Tests

One of the initial aims of this research was to reveal the scope of the contribution from mapping of LSRs to the vocabulary learning in an EFL context. To do so, an awareness test, which was based on the vocabulary already studied by the

students in the level of the target population during the first semester, was given to the treatment group as a pre-test. This pre-test was aimed to be used for the comparison of the treatment group, the first control group from the same school and level, and the second control group including native speaker participants from academic context.

Another use of the pre-test was for the comparison within the treatment group; another awareness test was provided for the same three groups as a post-test after the treatment process so that the results of the two tests could be compared. The word “awareness” is used to refer to the awareness towards the LSRs of each single word studied. In other words, it covers how aware a learner is of each related word nodes studied previously, rather than only being aware of LSRs in general. For this very reason, the term does not cause an ambiguity when used as a post-test.

4.2.1.1. The LSRs Awareness Pre-test

In order to see if there is a significant difference between the three groups of test-takers, each and every participants’ number of correct responds in the pre-test was for the comparison with the others’. Still, tests of normality should be applied at first hand to assure if the participants are normally distributed. Table 13 shows the results of test of normality.

Table 13

Test of Normality of Different Test-taker Groups for the LSRs Awareness Pre-test

		Shapiro-Wilk		
		Statistic	df	Sig.
Correct Responds	L2 Treatment	.952	20	.401
	Native Control	.918	20	.092
	L2Control	.970	20	.750

The population in each group is 20 participants, and Shapiro-Wilk statistics is often preferred in such occasions. Therefore, it is seen that the correct responds in each test-taker group are normally distributed ($p > .05$). Additionally, it is necessary to apply a test of homogeneity to acknowledge if the three groups are homogenous to be compared in One-Way ANOVA. Table14 indicates the data of Levene Statistic of the groups.

Table 14

Test of Homogeneity of Variances of the LSRs Awareness Pre-test

Levene Statistic	df1	df2	Sig.
5.702	2	57	.006

With respect to Levene's Test, it can be said that the variances are not homogeneous ($p < .05$). In fact, it is what was expected since one of the control groups consisted of the native speakers of English. To see if this presumption is correct, Table 15 reveals the descriptive statistics of the comparison.

Table 15

Descriptives of the LSRs Awareness Pre-test among Test-taker Groups

Groups	N	Mean	Sd
L2Treatment	20	8.550	2.946
Native Control	20	18.050	1.356
L2Control	20	9.300	2.792
Total	60	11.966	4.981

The test-takers from the control group of native speakers from academic context seem to have higher scores when compared to the participants of the other two groups which are EFL learners. Furthermore, the target EFL group, which is the candidate for being the treatment group, has the least mean score of all three levels, which indicates a heterogeneous distribution among the levels. Since the groups are normally distributed but it is a heterogeneous distribution, a Tamhane's T2 Post Hoc Test seems to be suitable for the verification of these differences.

Table 16

Tamhane Heterogenous Subsets for the Post-test Results among Different Groups

Source of Variance	Sum of Squares	df	Mean Squares	F	P	Tamhane
Between Groups	1115.833	2	557.917			Native Control > L2 Control
Within Groups	348.100	57	6.107	91.357	.000	L2 Control > L2Treatment
Total	1463.933	59				

There is a significant difference among the participant groups of the pre-test ($f_{2,59} = 91.357$, $p < .05$). In addition, Tamhane results show that the scores of the native control group are superior to the other two non-native groups. The prospective treatment group, on the other hand, has the lowest mean scores with respect to their pre-test results. However, the difference between the non-native groups is not significant individually ($p > .05$) as can also be understood from the mean scores.

4.2.1.2. The LSRs Awareness Post-test

As previously mentioned, one of the two objectives of conducting an LSRs Awareness Post-test was to make a comparison among the same test-taker participants after the semantic mapping treatment to the L2 treatment group. The same statistical procedure was followed in order to see if there is a significant difference among these groups in terms of the post-test results. Although the groups were proven to be normally distributed in the pre-test analysis, the treatment session was not a short period, and thus Table 17 is for the normality of the groups' distribution in the post-test.

Table 17

Test of Normality of Different Test-taker Groups for the LSRs Awareness Pre-test

	Group	Shapiro-Wilk		
		Statistic	df	Sig.
Correct Responds	L2 Treatment	.961	20	.563
	Native	.939	20	.225
	L2 Control	.945	20	.298

Table 17 indicates that the post-test scores of the test-taker groups are normally distributed as in the pre-test ($p > .05$). Therefore, the next step is to see if there is homogeneity of the variables. Table 18 shows the Levene Test results in this sense.

Table 18

Test of Homogeneity of Variances of the LSRs Awareness Post-test

Levene Statistic	df1	df2	Sig.
4,707	2	57	.013

The result highlights heterogeneity among the variables similar to the results obtained in the pre-test analysis ($p < .05$). However, this is not against what was expected just like happened in the pre-test process since one of the control groups already consists of the native speakers of English, and again one of the non-native groups was treated using semantic mapping. These qualities of these two groups notwithstanding, the third group received nothing but standard curriculum practice. All in all, the next step to be fulfilled is revealing what prevents homogeneity and Table 19 includes the mean scores of the group to make an assumption over it.

Table 19

Descriptives of the LSRs Awareness Post-test among Test-taker Groups

Groups	N	Mean	Sd
L2 Treatment	20	15.550	1.932
Native Control	20	17.400	1.231
L2 Control	20	6.500	2.564
Total	60	13.150	5.184

There seems to be a huge gap between the mean scores of the non-native control group and the other two groups. On the other hand, it is evident that the treatment group managed to bridge the gap between the native speaker control group, which can be seen in the mean scores comparison of the pre-test results. Similar to the pre-test statistics, the variables are normally distributed but are not homogeneous in the post-test. Therefore, Table 20 contains Tamhane's T2 Post Hoc Test results to represent this variation clearly.

Table 20

Tamhane Heterogenous Subsets for the Post-test Results among Different Groups

Source of Variance	Sum of Squares	df	Mean Squares	F	P	Tamhane
Between Groups	1360.900	2	680.450			Native Control > L2Treatment
Within Groups	224.750	57	3.943	172.572	.000	L2 Treatment> L2Control
Total	1585.650	59				

It can be understood that there is a significant difference between all three post-test taker groups in terms of their awareness towards lexical semantic relations ($f_{2,59} = 172.572$, $p < .05$). Furthermore, this variation is clear in Tamhane results as the native control group has significantly higher mean scores than the other two non-native groups. Still, it can be said that the non-native treatment group reduced its gap between

the native group causing a significant difference between their results and those of the non-native control group.

4.2.1.3. Comparison of the Pre-test and Post-test Results

As previously stated, one of the objectives of those LSRs Awareness Tests were to compare the pre-test with the post-test. The results of each test-taker group are intended to be compared individually, and, by doing so, it is planned to indicate any would-be variation within each and every independent universe autonomously.

The first comparison of pre-test and post-test results is related to the ones from the treatment group. The participants in this group, as known, were the subjects for the mapping of lexical semantic relations as treatment between pre-test and post-test assessments. Therefore, such a comparison within their results would indicate a great deal of findings in terms of the treatment session. In order to assure the normality between the pre-test and post-test, Shapiro-Wilk Test of Normality is conducted. Table 21 shows the results of the normality test.

Table 21

Shapiro-Wilk Test of Normality for the LSRs Awareness Pre-test and Post-test from the Treatment Group

Difference	Shapiro-Wilk		
	Statistics	df	Sig.
	.964	20	.622

As is seen, there is not a significant difference between the pre-test and the post-test results ($p > .05$). Therefore, the results of these two tests are available to be analyzed using Paired Samples t-Test so that an indication to any would-be difference after the treatment may be mentioned. Table 22 includes these results.

Table 22

Paired Samples t-Test Results for the LSRs Awareness Pre-test and Post-test from the Treatment Group

Measure	N	Mean	Sd	t	df	P
Pre-test	20	8.550	2.946	-10.405	19	.000
Post-test	20	15.550	1.932			

There is a significant difference between the results of the pre-test and post-test ($t_{19} = -10.405$, $p < .05$). This difference may be regarded as an indication of significant contribution from mapping of lexical semantic relations assisted by other strategies to the target population.

Such a variation between the pre-test and post-test results would not be expected in the native speaker control group. Still, it would be wise to compare their results as well in order to validate the similarity of these two tests. The normality results regarding the results from this population are given in Table 23.

Table 23

Shapiro-Wilk Test of Normality for the LSRs Awareness Pre-test and Post-test from the Native Speaker Group

Difference	Shapiro-Wilk		
	Statistics	df	Sig.
	.906	20	.054

There is not a significant difference between the pre-test and the post-test results applied to the native speaker participants ($p > .05$). Then it can be said that the data obtained from these participants are relevant to be compared using Paired Samples t-Test. Table 24 reflects this comparison.

Table 24

Paired Samples t-Test Results for the LSRs Awareness Pre-test and Post-test from the Native Speaker Group

Measure	N	Mean	Sd	t	df	P
Pre-test	20	18.050	1.356	1.685	19	.108
Post-test	20	17.400	1.231			

As presumed, there is not a significant difference between the results of the pre-test and post-test from the native group ($t_{19} = 1.685$, $p > .05$). Since they are the native speakers of English, any variation between the pre-test and post-test may reflect the existence of some drawbacks in terms of the quality of the tests. On the other hand, the results from the third test-taker group, namely the non-native speaker control group, may also reveal some findings regarding their target language vocabulary learning process. The Shapiro-Wilk Normality Test results obtained using their tests are given in Table 25.

Table 25

Shapiro-Wilk Test of Normality for the LSRs Awareness Pre-test and Post-test from the Non-native Speaker Control Group

Difference	Shapiro-Wilk		
	Statistics	df	Sig.
	.958	20	.505

Table 25 clearly shows that the non-native speaker control group is also suitable for a comparison as their results are not significantly different ($p > .05$). In fact, the normality of this current control group is also closer to the treatment group when compared with that of the native speaker control group. The Paired Samples t-Test results of this second control group are given in Table 26.

Table 26

Paired Samples t-Test Results for the Awareness Pre-test and Post-test from the Non-native Speaker Control Group

Measure	N	Mean	Sd	t	df	P
Pre-test	20	9.300	2.792	3.738	19	.001
Post-test	20	6.500	2.564			

The comparison of pre-test results and post-test results obtained from the non-native control group reveals a significant difference ($t_{19}= 3.738$, $p < .05$). Interestingly enough, it is seen that the direction of this difference is towards negative as the mean scores reveal a reduction. Considering this third test-taker group comes from the same universe as the treatment group while the treatment group has an increased sum, such a reduction may also have contributed to the difference between these two groups in terms of their One-Way ANOVA statistics.

4.2.2. Progress Tests of Lexical Semantic Relations

A second set of tests concerning influence of the lexical semantic relations over vocabulary learning was the Progress Tests. As it was illustrated in Table 11, those tests were conducted at the end of the weeks which are the multiples of three according to the treatment calendar. In other words, each three weeks' period is assessed using these Progress Tests in the end because a certain strategy group is exposed to changes while the other groups remained stable. For example, the focus of Units 7, 8 and 9 was on the Consolidation Social Strategies. It means that the strategies in this sense were subject to variation at this period. For Unit 7, students were asked to prepare flash cards and the teacher checked students' flash cards as this practice is among the Consolidation Social Strategies in Schmitt's taxonomy. Unit 8 covered interaction with native speakers using the words of the week, which is another strategy in the same vein. The last unit of the week, Unit 9, was based on standard Consolidation Social Strategy. It was towards the study and practice of meaning in a group, and was also implemented in the other units than Unit 7 and 8. The logic behind it was to see if a change within a certain strategy group meant to show fluctuation in the students' progress test results, and thus may have an influence over the mapping of semantic relations. In other words, students might learn a word in a certain unit better than the other one in a different unit just

because of this variation, and it would trigger negativity over the reliability of the semantic mapping since it was not impossible to conduct a treatment without other strategies. In conclusion, all three-week-periods may have included all the strategy types, yet each period focused on a different strategy category. The statistics obtained from the progress tests, therefore, aimed to indicate any potential change in the meantime and this change would reveal an influence on the whole process.

Five Progress Tests were conducted during the 15-week treatment session. Each was prepared in the same vein. The initial statistical operation towards the analysis of these tests is Shapiro-Wilk Test of Normality to see if they are normally distributed. Table 27 includes the results of this test and the test of each three weeks is named in accordance with the strategy group it handles below.

Table 27

Shapiro-Wilk Test of Normality Results for the Progress Tests of Lexical Semantic Relations

	Shapiro-Wilk		
	Statistic	df	Sig.
Discovery-DET	.966	20	.676
Discovery-SOC	.938	20	.219
Consolation-SOC	.933	20	.174
Consolidation-COG	.926	20	.130
Consolidation-MET	.946	20	.313

It is clear that all five Progress Tests are normally distributed ($p > .05$). As a result, it can be said that the analysis may go on with Repeated Measures ANOVA to see if there is a significant difference among the scores of these tests. Table 28 shows the differences between the mean scores beforehand.

Table 28

Descriptive Statistics towards the Progress Tests of Lexical Semantic Relations

Measure	N	$\bar{X}$	Sd
Discovery-DET	20	13.600	2.741
Discovery-SOC	20	14.300	1.866
Consolation-SOC	20	14.050	2.089
Consolidation-COG	20	13.950	1.959
Consolidation-MET	20	13.450	2.163

The descriptive statistics also indicate that none of the tests seems to be significantly different from the others. That is to say, the differences are so minor that they are at fractional levels. The relative insignificance obtained from Repeated Measures ANOVA is stated in Table 29.

Table 29

Repeated Measures ANOVA Analysis Related to the Progress Tests of Lexical Semantic Relations

Source of Variance	Sum of Squares	df	Mean Square	F	P	Bonferroni
Within-Subjects	9.460	1	2.365	.465	.761	Discovery SOC > Consolidation SOC > Consolidation COG > Discovery DET > Consolidation MET
Measure	19237.690	1	19237.690			
Error	67.710	19	3.564			
Total	19314.86	21	19243.619			

Table 29 highlights that there is not a significant difference in terms of the Progress Tests scores of the treatment group ($f_{1-19} = .465, p > .05$). On the other hand, the pairwise comparison indicates that Discovery Social Strategies lead to better results as a facilitator strategy group for semantic mapping of lexical semantic relations. Moreover, the other Social Strategy group, Consolidation Social Strategies, seems to have better contributions to semantic mapping of lexical semantic relations when compared to the other three groups.

4.2.3. The Vocabulary Size Tests

Thanks to its being a robust means of obtaining feedback over what the test-takers know rather than what they have learned, the Vocabulary Size Test provides discrete data for this research. 20,000 versions of the test were used to measure the vocabulary size of the treatment group and the non-native speaker control group. The participant groups took the test both as a pre-test and a post-test for a better remark on the comparison of their vocabulary size before and after the treatment to the target population. The following lines include the analyses of the pre-test, post-test and the comparison of both test sessions.

4.2.3.1. The Vocabulary Size Pre-test

The treatment group and the non-native speaker control group belong to the same level in their departments and their pre-test results should normally show similarities. If this hypothesis comes true, then it can be said that the vocabulary known by the members of both groups are parallel and the results would be suitable for further comparisons after the treatment. The Shapiro-Wilk Test of Normality results of pre-test are given in Table 30 below.

Table 30

Test of Normality of Different Test-taker Groups for the Vocabulary Size Pre-test

		Shapiro-Wilk		
Group		Statistic	df	Sig.
Pre-test Scores	L2 Treatment	.946	20	.311
	L2 Control	.975	20	.849

The students who were expected to compose the treatment group and the students of the control group are normally distributed ($p > .05$). Additionally, to see if they are precisely distributed, measures of Skewness and Kurtosis were investigated. Table 31 shows these distributions.

Table 31

Skewness and Kurtosis Results of Different Test-taker Groups for the Vocabulary Size Pre-test

	Group	Measures	Statistics
Pre-test Scores	L2 Treatment	Skewness	.520
		Kurtosis	-.252
	L2 Control	Skewness	-.341
		Kurtosis	-.262

Based on the quite symmetric data, it can be said that the distribution in each group is reasonable. The data seems to be appropriate to conduct Independent Samples t-Test. Still, Levene's Test depicts the variance analysis as in Table 32.

Table 32

Levene's Test Results for the Equality of the Student Grades in the Vocabulary Size Pre-test

		Levene's Test for Equality Variances	
		F	Sig.
Pre-test Scores	Equal variances assumed	.125	.725

Levene's Test result depicts a normal distribution between the student grades as in Table 18 ($p > .05$). Since all three types of statistics above indicate an accurate distribution between the variables, it is possible to apply Independent Samples t-Test to see whether there is a significant difference between the correct responds of the students from both test-taker groups to the Vocabulary Size Pre-test. Table 33 shows the results of the Independent Samples t-Test.

Table 33

Independent Samples t-Test Results Related to the Correct Responds from the Vocabulary Size Pre-test

Group	N	Mean	Sd	t	df	P
L2 Treatment	20	5380.000	797.100	-.514	38	.610
L2 Control	20	5510.000	801.249			

It is evident that there is not a significant difference between the pre-test scores of the test-taker groups ($t_{38} = -.514, p > .05$). A minimal difference between the mean scores does not seem to cause inconvenience, and thus allowing saying that the vocabulary sizes of the treatment group and the non-native control group are reasonably close.

4.2.3.2. The Vocabulary Size Post-test

The previously mentioned tests indicate that the mapping of lexical semantic relations as a Memory Strategy contributed significantly to the vocabulary learned by the treatment group. On the other hand, whether the treatment had any positive influence over the vocabulary size, which consists of the words known rather than the words learned, can be measured through the comparison of the pre-test results given above and the post-test results given hereafter. Again, Table 34 includes the Shapiro-Wilk Test of Normality results of the post-test.

Table 34

Test of Normality of Different Test-taker Groups for the Vocabulary Size Post-test

	Group	Shapiro-Wilk		
		Statistic	df	Sig.
Post-test Scores	L2 Treatment	.960	20	.553
	L2 Control	.957	20	.480

The Shapiro-Wilk results highlights the normality of the participant groups of the post-test ($p > .05$). As in the pre-test analysis, Skewness and Kurtosis descriptive results are intended to visualize the normality of the distribution in each participant group. The results are as in Table 35.

Table 35

Skewness and Kurtosis Results of Different Test-taker Groups for the Vocabulary Size Post-test

	Group	Measures	Statistics
Post-test Scores	L2 Treatment	Skewness	.494
		Kurtosis	-.217
	L2 Control	Skewness	.637
		Kurtosis	.613

It is seen that the distribution is quite average for each group in the post-test as well. For an in-depth point of view, however, it can be said that the post-test scores of the non-native control group stands for the greatest variation of the Vocabulary Size Tests. Nonetheless, Levene's Test in Table 36 indicates whether this variation threatens the equality of the variances.

Table 36

Levene's Test Results for the Equality of the Student Grades in the Vocabulary Size Post-test

		Levene's Test for Equality Variances	
		F	Sig.
Post-test Scores	Equal variances assumed	1.597	.214

The Levene's Test result reveals the equality of the student scores obtained from the post-test ($p > .05$). Therefore, the groups are suitable to be compared using Independent Samples t-Test again. Table 37 includes the data of this comparison.

Table 37

Independent Samples t-Test Results Related to the Correct Responds from the Vocabulary Size Post-test

Group	N	Mean	Sd	t	df	P
L2 Treatment	20	8910.000	1166.596	9.067	38	.000
L2 Control	20	5910.000	910.118			

A significant difference between the vocabulary sizes of the treatment group and the non-native speaker control group can be inferred ($t_{38} = 9.607$, $p < .05$). The mean scores also indicate a huge gap between the two groups, which stands for an average of 15 more correct responds out of 100 questions in the post-test. Such a gap should mean a considerable outcome of the treatment.

4.2.3.3. A Comparison of the Vocabulary Size Pre-test and Post-test

A final statistical remark worth mentioning is the comparison of the Vocabulary Size Test conducted as the pre-test and its post-test counterpart. Such a comparison may indicate a compact approach for the influence of the treatment within the treatment group as well as it may imply further about the vocabulary education in EFL context through the results of the non-native speaker control group.

The first comparison in this sense is to see if the non-native speaker control group had any significant difference between the pre-test and the post-test. Therefore, the data will be obtained through Paired Samples t-Test. Table 38 shows the Shapiro-Wilk results related to this participant group before this comparison.

Table 38

Test of Normality for the Comparison of Vocabulary Size Pre-test and Post-test from the Non-native Speaker Control Group

Difference	Shapiro-Wilk		
	Statistics	df	Sig.
	.978	20	.899

The pre-test and post-test results of the non-native speaker control group seem to be normally distributed ($p > .05$). However, Skewness and Kurtosis results will depict the shape of this distribution better. Table 39 is towards these analyses.

Table 39

Skewness and Kurtosis Results for the Comparison of Vocabulary Size Pre-test and Post-test from the Non-native Speaker Control Group

Test Scores	Measures	Statistics
	Skewness	.051
	Kurtosis	-.548

As indicated above, the distribution is reasonable. The data seems to be appropriate to conduct further analysis. As both of the primary analyses seem to be relevant for the comparison, the next step is to see if there is a significant difference between the vocabulary sizes of this control group at the time of pre-test and post-test. The results of the comparison are stated in Table 40.

Table 40

Paired Samples t-Test Results Related to the Comparison of the Vocabulary Size Pre-test and Post-test from the Non-native Speaker Control Group

Test	N	Mean	Sd	t	Df	P
Pre-test	20	5525.000	782.623	-1.430	19	.169
Post-test	20	5910.000	910.118			

Based on the data given, it can be said that there is not a significant difference between the vocabulary sizes of the non-native speaker control group at the time of the pre-test and post-test ($t_{19} = -1.430$, $p > .05$). On the other hand, the direction of the minor change in the mean scores is towards positive; that is to say, there is an increase in the correct responds to the post-test. However, this direction is limited with only 2 correct answers than in the pre-test as the difference is approximately 400 points.

On the other hand, it was previously pointed out that the treatment group had a relatively higher mean score in the post-test session. However, another Paired Samples t-Test is fundamental to assure the significance, if it is, of the case in the treatment

group. The regular process in the other analyses is true in this very last analysis, too; therefore, Table 41 is towards the Shapiro-Wilk Test of Normality.

Table 41

Test of Normality for the Comparison of Vocabulary Size Pre-test and Post-test from the Treatment Group

Difference	Shapiro-Wilk		
	Statistics	df	Sig.
	.967	20	.688

As given in Table 41, pre-test and the post-test scores of the treatment group are normally distributed ($p > .05$). To see how precisely this distribution has taken place, Skewness and Kurtosis descriptive analyses should be checked. The results of these analyses are given in Table 42 below.

Table 42

Skewness and Kurtosis Results for the Comparison of Vocabulary Size Pre-test and Post-test from the Treatment Group

Test Scores	Measures	Statistics
	Skewness	.192
	Kurtosis	-.411

The descriptive results reveal that the distribution of the pre-test and post-test scores is undoubtedly accurate. Therefore, there is no obstacle for the comparison of the test scores using Paired Samples t-Test. Table 43 represents the data attained through it.

Table 43

Paired Samples t-Test Results Related to the Comparison of the Vocabulary Size Pre-test and Post-test from the Treatment Group

Test	N	Mean	Sd	t	df	P
Pre-test	20	5380.000	797.100	-10.573	19	.000
Post-test	20	8910.000	1166.596			

In accordance with the statistics provided in Table 43, it is crystal clear that there is a significant difference between the pre-test scores and the post-test scores of the treatment group ($t_{19} = -10.5730, p < .05$). Moreover, it is understood that the degree of this difference is around 17 more correct responds in the post-test as each correct question means 200 points in Nation's 20,000 words family Vocabulary Size Test, which is 100 questions in total.

4.3. Results of the Descriptive Phase

As said before, the participants were asked to fill in a descriptive survey mostly based on open-ended questions about their views towards the treatment session. This survey was an online one and provided right after the treatment session was over, which also means at the end of the semester. As a result of this, 13 out of 20 participants responded to the survey with their own accord. The following analyses include the survey items directed to the participants.

The participants were required to respond in a narrative way so as to obtain their in-depth feedback towards the treatment. Other descriptive means such as a Likert scale may definitely work in many descriptive cases; however, this current study presents a treatment and the points that the respondents touched on would best be obtained through a guided survey in which they reflect their views through open-ended items. They were directed the questions in Table 8 on page 12 in a written form at the end of the whole procedure. That was in order to make them feel free to reflect as they really believe without any pressure. Also, the survey items were really not many but to the point.

The following analyses include these survey items directed to the participants. It was stated in the previous chapter that the feedback was obtained using SurveyMonkey® as it has direct data transfer facilities to NVivo 10 qualitative data analysis software. The data is processed in a variety of ways by this software. One of these is word clouds, which is quite useful to see an overall picture of the responds. The most commonly used words are in larger fonts so it is used in this research to get an implication in each item. The software also provides the frequency results of these words in the form of weighted percentage and also count. Therefore, the commonality of the words is highlighted and the message beyond the words can be inspected. A final function of the qualitative data analysis this way was in terms of relating individual responses one another. That is, a correlation between the student responses was done through nodes clustered by word

item of the cloud. To see the details of the word frequency analysis, their appearances are counted and their weighted percentages are calculated. The details based on the data of the most common 10 words are as shown in Table 44.

Table 44

The Frequency Query of the Most Common Ten Words for the First Survey Item

Word	Count	Weighted Percentage (%)
words	21	7.84
study	9	3.36
learned	8	2.99
vocabulary	8	2.99
contributed	7	2.61
technique	7	2.61
learn	4	1.49
word	4	1.49
yes	4	1.49
across	3	1.12

Based on the declarative nature of the words given above in Table 43, the statistics seem to provide positive implications towards the contribution of the technique which was applied to the treatment group (see the Appendix V for the complete list of the word frequency and Appendix VI for the contexts of the words). A further analysis was towards the taxonomy of the participants with regards to the nature of their expressions for this survey item. Figure 4 depicts this taxonomy on student basis.

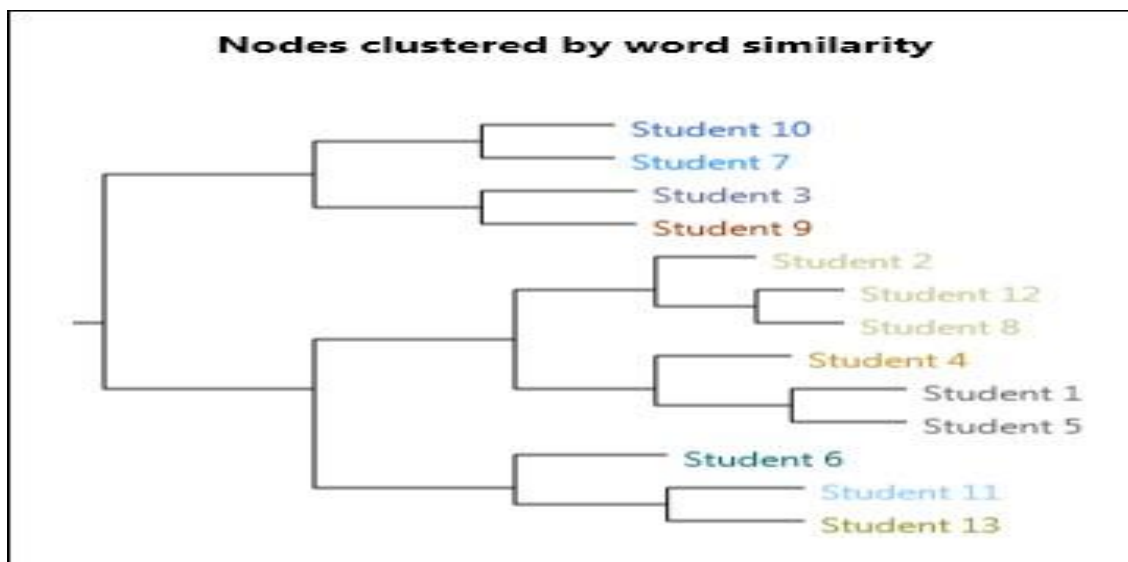


Figure 4. The student nodes clustered by their word similarity for the first survey item

As for the transcription of the first node, the values of Pearson's correlation coefficient (Pearson's r) will be stated (see the full table in Appendix VII). The common argument of the first node, namely between Student 10 and Student 7, seems to be on the contribution of this vocabulary learning technique in terms of its integrating more and more other words while studying a certain word ($r = .34$). On the other hand, the next node of Student 3 and Student 9 stresses the significance of the technique in terms of its facilitating the process of keeping the target words in mental lexicon thanks to their semantically related partners ($r = .21$). A final remark is towards the common grounds of the two nodes mentioned above: both of the nodes are of the opinion that these techniques contributed to the participants through making them keep the target vocabulary in their mind in semantic relation to many other words.

Another node is based on the views of Student 12 and Student 8 towards their new approach to vocabulary study after the treatment, which guided them on how to study vocabulary as they say. Their correlation is by far the most significant one when compared to all other nodes ($r = .63$). Student 2 also joins to this couple of students with strong correlation values by giving a specific example for the contribution of the treatment; that is, he could perform a better vocabulary study as the words appeared to be further catchy through the mapping of lexical semantic relations than before.

Still another node clustered in accordance with the correlation of the students' responds to the first survey item includes Student 1 and Student 5 with a significant value as well ($r = .46$). These two participants are of the opinion that they can recognize

a great deal of vocabulary in everyday situations better than before, and added that they are able to use their mind efficiently for this purpose thanks to the lexical semantic relations. By stating the everyday situations, they also cover the exams. In a parallel view, a third participant, Student 4, underlines the attainment of better grades from reading comprehension questions in their exams through lexical semantic relations.

A final node to be analyzed individually between correlated responds of the students is those of Student 11 and Student 13 ($r = .32$). Their common ground seems to be the drawbacks they were exposed to with respect to vocabulary. In other words, vocabulary seems to be rather problematic before the mapping of lexical semantic relations in that it caused a phobia especially against vocabulary parts of the exams. However, they suggest that this technique made them comfortable in terms of vocabulary. Student 6 agreed with them on learning vocabulary easily via this way too.

4.3.2. Survey Item #2

The next survey item oriented towards the participants of the treatment was to seek information if they experienced any inconvenience during the procedure. This was the very question to obtain data in order to improve the quality of the whole process for further studies. The results are as given in Table 45 below.

Table 45

Responses to the Second Survey Item on Experiencing any Inconvenience

Response	Number
Yes	1
No	12

The respondents who went for the latter option outnumbered the former one. That means only one of the participants opined that he or she experienced an inconvenience. Therefore, there is a limited resource to obtain any negative feedback related to the process. The former option was also a prerequisite for a second enquiry on the content of the inconvenience. Thus the only participant to choose that option was asked to state what the content of his or her inconvenience was. The criticism received was as follows:

Table 46

The Frequency Query of the Most Common Ten Words for the Third Survey Item

Word	Count	Weighted Percentage (%)
words	14	6.83
technique	9	4.39
relations	6	2.93
learn	5	2.44
much	5	2.44
semantic	5	2.44
vocabulary	5	2.44
antonyms	4	1.95
learned	4	1.95
synonyms	4	1.95

Synonyms and antonyms, which are the two very popular semantic relations, seem to be among the most common words as well as the word “semantic” itself. On the other hand, other semantic relations which also took part throughout the treatment process also have a relatively significant percentage (see Appendix VIII for the full list). Moreover, these semantic relations are commonly used in affirmative sentences with verbs in the sense of “learn”, which can be accepted as a signal of their positive attitudes towards the study (see Appendix IX for the complete register). The constituents of the acquisition that the respondents state can be classified thanks to the node clusters by word similarity of the participants as given in Figure 6.

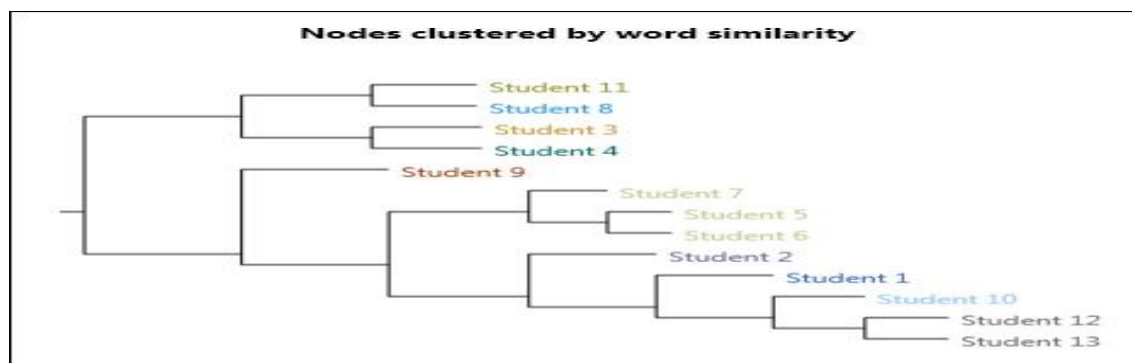


Figure 6. The student nodes clustered by their word similarity for the third survey item

The first node cluster is between Student 11 and Student 8 as seen in Figure 6. The relationship between their expressions is parallel in terms of their direct reference to semantic relations as acquired ($r = .33$). There seems to be other significant correlations with especially the former student's statement; however, those counterparts took part in statistically higher correlations than the one with this student. As a result, this couple mentioned above constitutes a node (see Appendix X for the unabridged list of correlations). Besides this node, Student 3 and Student 4 also comments on the acquisition of semantic relations by using style disjuncts more to express their personal views on the study ($r = .29$). The first two couples, in sum, share the opinion that the study contributed to the acquisition of semantic relations of words.

In another respect, the focal point of the comments from Student 5 and Student 6 is their exposure to much more words while aiming to learn a certain list of words when compared to other strategies that they had carried out before ($r = .67$). In a similar vein, Student 7 indicates that the treatment made the vocabulary learning better. Additionally, Student 12 and Student 13 expressed the influence of this treatment by saying what made them learn the relations between words was nothing but this study ($r = .51$). As a further comment to this very last node, Student 10 admitted that he or she would not have considered looking up the semantic relations of the words if they were required only individual vocabulary study. The remark from Student 1 refers to negligence of semantic relations in his or her language learning background, which may be true in many EFL contexts. The last respondent to be analyzed is Student 2, highlighting all the semantic relations given in the treatment by name as the words which were additionally learned. The common ground of the respondents in this paragraph can be summarized as the acquisition of additional words which were not normally intended to be learned, but were done so indirectly, or maybe subconsciously.

4.3.4. Survey Item #4

In this very last survey item, the participants were frankly asked to reflect their overall evaluation related to the mapping of lexical semantic relation as a vocabulary learning strategy. It was yet another open-ended item and the most detailed responses were expected here. The reflection of the most common words is as in Figure 7.

Table 47 is a broad outline of the words in terms of commonality with a covert message about the overall attitudes of the respondents (see Appendix XI for the full list of the percentages). To draw an overt picture, the responds are stratified into the nodes of students with similar views as usual. As known from the analyses of the previous items, those node clusters are based on the context of the expressions. Figure 8 given below includes the node clusters for the last survey item.

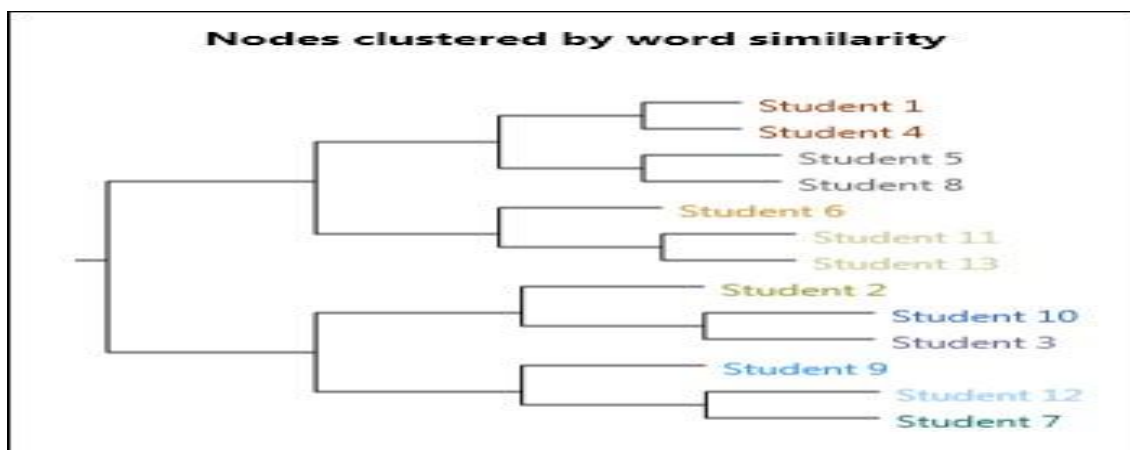


Figure 8. The student nodes clustered by their word similarity for the fourth survey item

As seen in Figure 8, Student 1 and Student 4 consist of the first cluster. The common ground in this node is the students' expressing their gratitude for being introduced to this "ideal" and "helpful" technique for the improvement of their mental dictionary, as they state ($r = .59$). The correlation between the views of these respondents seems to be the highest when compared to the others (see Appendix XII for the whole responses and Appendix XIII for the unabridged list of Pearson correlation coefficients). Besides their appreciation as in the previous node, the next node of Student 5 and Student 8 also underlines some negative aspects of the study. For instance, they were sometimes fed up or bored with it, and were sleepless due to heavy work; however, they reckon it was worth it after all ($r = .34$). In a more detailed perspective, Student 11 and Student 13 mentioned that they learned the vocabulary better because they understood the words, and thus took them in ($r = .37$). This view seems to provide crucial feedback, but intake usually requires effort. Student 6 stressed out the effort given in this treatment. To sum up, the participants in the nodes above highlight the intake obtained through the mapping of lexical semantic relations.

When the issue is effort put into this practice, the node of Student 10 and Student 3 approaches to this procedure as a demanding one, and they regarded it as a

success to carry on simultaneously with the curriculum ($r = .15$). Student 2 also shares a similar idea about the “time-taking” side of the treatment while calling it as the most suitable strategy to learn vocabulary wholly. A further node consists of Student 12 and Student 7, who identify the treatment as a cool and beneficial way of learning vocabulary especially for prep students ($r = .13$). The last respondent, Student 9, acknowledges the contribution of this treatment as such an analysis of the words using different perspectives makes a prep student’s mind increase the capacity to understand. All in all, the respondents who take part in this paragraph focused mainly on the effort, to which the intake mentioned in the previous paragraph attributed.

CHAPTER V

DISCUSSION AND CONCLUSION

5.1. Introduction

This chapter will initially cover a general overview of the study. The following subheading is aimed to be towards the discussion of the research questions in the light of the results, and the implications obtained can be seen in the ensuing lines. Following the recommendations for further research, the culmination is due with personal reflections and criticism of the study.

5.2. General Overview of the Study

This study traces how a large-scale, long-term vocabulary growth can be attained in EFL context focusing on the receptive aspects of vocabulary schemata. The size of the vocabulary known by the accessible population has long been criticized to be lower than expected when compared to the instruction that they receive. There definitely is a role of the social backgrounds of the learners with this respect, yet other issues require to be speculated as well.

One of those issues was that learning is different than acquisition, and thus it is not limited with being exposed to the target language. The former stage before the state of taking knowledge in is, therefore, learning it. At this very point, vocabulary learning strategies stand for an undeniable must for learners to enhance mental lexicon. On the other hand, not all strategies serve for the same purposes. Since a mental lexicon of the qualities stated in the above lines require relating concepts to their properties and counterparts, the synsets of lexical semantic relations offer a lot in pedagogical realm. To do so, all learners and educators need seems to be idiosyncratic experience of individuals. In another saying, every participant of a language instruction has a unique real world experience, and such background knowledge should play an active role in learning a foreign language by conveying it into instruction. Through semantic mapping, a seldom used strategy in foreign language education according to related literature, these synsets based on individual experience are available to be modified as nodes for relevant schemata.

Taking a vocabulary size pre-test and another pre-test based on the vocabulary previously learned, it was seen that non-native groups were of the same level while different from the native speakers. Then the treatment group started to undergo the practice of semantic mapping. The participants were asked to keep their personal synset mapping for each new lexeme through their personal points of view. Still, some other supplementary resources, especially the WordNet[®] database, were there for the use of the learners whenever necessary since new words might have occasionally been ambiguous for them due to some sort of cultural or other social reasons. They were already provided a template for this purpose, which would form a learner dictionary when accumulated in the end. A further labor was to collect these synsets from the samples and mount them on an online database for their later use.

The procedure was also supplemented with some other strategies since no single one is a definite panacea for all needs. Those auxiliary strategies were clustered considering Schmitt's inventory (1997) and within every three weeks, a certain strategy group was due to internal variations as the other strategies remained the same meanwhile. The template also included sections for these strategies in addition to semantic mapping. At the end of each three weeks, a progress test was conducted to be compared with the others so that any fluctuation would indicate a significant change between the interactions of the strategies.

Once the treatment session was over, all the participants took a vocabulary size post-test and a post-test of the vocabulary learned throughout the study, which are in similar vein to those in the pre-tests. The results indicated that the vocabulary known by the treatment group was way different from the non-native control groups'. The results did not only indicate a difference between these two groups, but also within the pre-tests and the post-tests. It is also clear that the comparison of the vocabulary known before and after the treatment reflects a positive change for the treatment group.

The other test, which was conducted to measure the vocabulary learned, is not less essential in that it might represent any contribution from semantic mapping at first hand. The statistical data analysis reveals that there is another remarkable difference between the treatment group and the non-native control group after the process. Additionally, the post-test scores of the treatment group surpassed their pre-test scores, which may be an implication for the impact of the strategy in terms of raising semantic awareness.

The other means of the triangulation, or the qualitative data, also support the statistical results. The overall attitude of the participants seems to be positive except from some trivial remarks. The correlations between the open-ended responds also supply the consistency of the perspectives. The evident hard work in the learner dictionaries is another manifestation of their position on semantic mapping.

5.3. Discussion of the Findings in Reference to Research Questions Research Question 1

To what extent can the mapping of lexical semantic relations contribute to the vocabulary learning in an academic EFL context?

The statistical results seeking a response for the first research question are twofold: first is between the three groups of test-takers, and next is within these groups. As the LSRs Awareness Pre-test indicated no significant difference between the non-native speaker test-takers, these two groups were granted as being parallel in terms of their proficiency in the vocabulary which was learned in the first semester. Conversely, the scores obtained from the native speaker group from academic context were way different from both non-native speaker groups, which was as expected.

The comparison of the post-test results between all three groups, however, revealed a considerable variation between the non-native speaker groups. Based on the descriptive data, a rise, which is as much as the double score of the pre-test, was evident in the post-test mean score of the treatment group. Despite a superficial decrease in the post-test mean score of the native speaker group, it was in the form of a dramatic regression from the non-native speaker control perspective. As a result, the gap between the non-native speaker treatment group and the native speaker control group narrowed while there happened to be a new one between the non-native speaker groups after the treatment.

In the cases of both non-native speaker groups, the role of semantic memory seems to be undeniable. As for Tulving (1986), this type of memory involves general, abstract, timeless knowledge that a person shares with others. In other words, it has much to do with mental lexicon of the EFL learners. The decrease in the vocabulary learned by the non-native speaker control group may be attributed to deterioration in the performance of related memory, and the causes might be in terms of practice. Poirier et al. (2014) emphasize that the representation of the words in an immediate serial recall

task relies on available language-processing systems, including activation within and between phonological, sublexical, lexical, and semantic networks. The learning strategies carried out by the non-native control group may have been short of meeting the activation of one or more of these networks. Vocabulary exams conducted in this research are typical examples of such recall tasks and student responses can be regarded as controlled actions. It was previously mentioned that executive processes in this sense employ WM, specifically the central executive (Smith and Kosslyn, 2006, p. 281). Besides this fact, previous research also confirmed the influence of long-term, schematic representation on WM performance (Belacchi, Benelli, and Dispaldro, 2013, p. 17). Vocabulary learning strategies applied in this group probably missed semantic aspects and as the load increased, it resulted in vice versa on behalf of performance. Whereas, semantic awareness, which was one of the purposes of this study and practiced through semantic mapping, appears to have contributed to the results in a positive way. That may have come true not only in terms of providing new means of vocabulary learning, but also leading semantic memory to remain active, perhaps even more than any other point in time.

Research Question 2

Do other supplementary vocabulary strategies have a significant influence over mapping of lexical semantic relations?

Compatibility of strategies is a key concept in vocabulary instruction which is handled in a variety of perspectives. An example can be the compatibility of the strategies with human brain. The brain-compatible classroom activities are one of the results of the studies made about the brain and its ability to learn, and their principles help students learn the words in their field in a natural way (Lago and Seepho, 2012, p. 1). Another type of compatibility is the one between vocabulary learning strategies and vocabulary teaching strategies. That is, how compatible the vocabulary learning strategies of the students are with the vocabulary teaching strategies in a language classroom is another issue to be investigated (Takač, 2008, p. 113).

The analysis towards the compatibility of strategies in this current research was between the mapping of lexical semantic relations as the focal strategy of the treatment, and the strategies which were conducted in addition. Fifteen other vocabulary learning strategies than semantic mapping were chosen as inclusion for the practice as supplementary components. Since semantic mapping is a type of Memory Strategy in

the inventory of vocabulary learning strategies (Schmitt, 1997), no other strategies in this category was included. On the other hand, the other types, namely Discovery-Determination, Discovery-Social, Consolidation-Social, Consolidation-Cognitive and Consolidation-Metacognitive were represented each with three strategies, and thus fifteen in total. These strategies were applied to monitor any fluctuation generated by other strategies and to investigate if any of these categories better contribute extensively to semantic mapping than the others.

Based on the analysis, it was seen that no specific supplementary strategy group influences semantic mapping remarkably better or worse than the others discounting minor changes. Therefore, the impact of semantic mapping over the vocabulary learned by the treatment group is definite regardless of other strategies, though those trivial details varying among different supplementary strategies can also have earthly reasons for being so.

A logical reason why there was not a significant difference between the contribution rates of the other supplementary strategies can be the comprehensive nature of the semantic mapping applied in the treatment. As stated before, the principle of Memory Strategies is to create in the mind an artificial structure that incorporates unfamiliar ideas or, especially, a series of dissociated ideas that by themselves are difficult to remember (Nolen, 2014). To do so, a strategy in this category usually aims at (a) creating mental linkages, (b) applying images and sounds, (c) reviewing well, or (d) employing action (Oxford (1990, p. 39). As the semantic mapping treatment of this study included all these as much as possible, it fulfilled its role as a Memory Strategy. It acted just as a “framework” on which any other supplementary strategy could be attached, adapted or configured, each probably with a different contribution but with a similar rate of influence.

Research Question 3

If yes, to what extent is the mapping of lexical semantic relations influenced by other selected supplementary strategies?

As indicated above, there is no significant impact of other supplementary strategies over semantic mapping. Even so, the superficial fluctuation among their statistical results might bear certain points to be considered. With this in mind, the following lines include an overall evaluation of each type of strategy.

3. a. Determination Strategies as Discovery Strategies

“Bilingual dictionary use”, “checking for L1 cognates of the words” and “guessing from textual context” were the strategies practiced under this heading for the first three units. The result of the first progress test is the second least successful one with a slightly higher mean score. In fact, such a score is noteworthy to some extent.

It is known that some of the strategies in this category are among the top rated strategies in Schmitt’s taxonomy (1997). As an instance, the use of bilingual dictionaries was 85% with a helpfulness rate of 95%. Parallel to these results in the taxonomy, this strategy has always been observed as one of the most commonly used strategies in the accessible population as well. Contrary to the learners’ approach towards its helpfulness, the frequent use of bilingual dictionaries may have a counter effect in that the more it is applied, the less enthusiasm it evokes. In other words, the common use of a certain strategy may blunt the efficiency of it.

Guessing from textual context, which is another strategy in this category, stands for a support to the argument stated above. The rate of its use is 74% in the taxonomy and the learners’ use it frequently too, whereas it seems to be not better than the other strategies in other categories. Therefore, it may be a remarkable idea for learners to shift among the strategies, at least from time to time, rather than keeping up with certain ones throughout learning.

A third strategy, checking L1 cognates of the words, also underlies a further remark to be noted. As said before, the number of the cognates and false cognates between English and Turkish are as few as 2411 (Uzun and Salihoğlu, 2009). Consequently, the practice of this third strategy might not have contributed to the treatment when compared with the others since learners could not find enough words in this sense to work out.

3. b. Social Strategies as Discovery Strategies

“Asking teacher for paraphrase or synonym of new word”, “asking teacher for an L1 translation” and “asking teacher for a sentence including the new word” were the social strategies determined for discovery purposes. Generally speaking, the EFL instructors at this institution are the only social resources to consult information thoroughly in person. As a result, all three strategies in this category are based on the vocabulary knowledge obtained from the instructor of the treatment group.

The progress test conducted at the end of this second three-unit session has the highest mean score with the lowest standard deviation. “Learner-centred” and “teacher as facilitator” are among the most influential concepts (re)shaping education over the past decades (Phan, 2014). For this reason, these teacher-centred strategies, which have the highest progress test result, may be misinterpreted at first glance. However, they are merely supplementary strategies to a rather learner-centred treatment of semantic mapping, both by individual means and collaborative means. Therefore, they function as intended; regarding teacher as facilitator. All in all, they seem to be the most compatible strategy category with semantic mapping when compared to the others, though not with much discrete than the other strategies.

3. c. Social Strategies as Consolidation Strategies

Yet another social strategy type was provided in consolidation cluster of the inventory. Based on the mean scores in the results section, the top second remarkable assistance was provided through these strategies. The first strategy with this respect was towards “students' flash cards or word lists and teacher's check for accuracy”. It was previously stated that even only the act of making flash cards will help them learn a lot of the words (Dear Teacher, 2000). The progress test results are consistent with this view.

Following that, students were required to “interact with native speakers” and they were directed to the foreign language teaching assistants who were already available at the school. A recent study indicated that the lexical language-related interaction between intermediate to advanced learners and native speakers tend to be more frequent and more likely to be successfully resolved (Dobao, 2012). For this reason, it can be said that the practice of this current strategy seems to have a positive role over the semantic mapping.

The last strategy under this heading was on the “study and practice of meaning in a group” and the group here was the whole class. Since the collaboration among students has an indispensable position throughout the treatment, the impact of their interaction is not much surprising. In sum, the strategies which are socially constructed in both main strategy groups seem to contribute more than the other types despite the insignificance of the statistics towards their difference. As a result, it can be said that vocabulary instruction should utilize social interaction as much as possible; not only to discover new words, but also to consolidate them.

3. d. Cognitive Strategies as Consolidation Strategies

Cognitive strategies were expected not to be among the least compatible ones because semantic mapping as a memory strategy has much to do with cognition. It was previously mentioned towards the difference between these two types of strategies that the cognitive strategies do not focus so specifically on manipulative mental processing; they include repetition and using mechanical means to study vocabulary (Schmitt, 1997). However, they may process in an interactive way.

The strategies used in this current study consisted of “written repetition”, “flash cards” and “using the vocabulary section in students’ textbook”. The academic background of the learners might also have a quite ease for the practicality of the cognitive strategies. Additionally, it can be seen in Schmitt’s inventory that the use and the helpfulness of cognitive strategies are relatively higher than the other types. In fact, there is not even a single strategy with a low rank other than the use of flash cards with a percentage of 25%. However, there is not a direct proportion between their high statistics in the inventory and the results of the progress tests. They can only stand for the middle position in the order of contribution.

3. e. Metacognitive Strategies as Consolidation Strategies

Despite never-ending interrogations from students concordantly, metacognition still seems to be far from being advanced. The students were asked to “continue to study word over time”, “use English language media” and “test themselves with word tests” as their being metacognitive strategies for vocabulary learning. The data from the progress tests point out that metacognition has the least effect over semantic mapping. Perhaps such activities are considered as a polish rather than a significant link of the whole chain as the others.

The logic behind determining these strategies but not the others in the inventory is merely not to provoke an unusual circumstance other than the semantic mapping practice. In other words, those provided were normally the strategies used in any EFL classroom of the institution. Otherwise, they were not aimed to make a difference at all. The low results in terms of this strategy cluster may result from its taking place at the final position. That is to say, metacognitive strategies are naturally conducted at the very end of a vocabulary practice. It often requires learner’s self study. For this reason, its influence over the practice in this study may be quite weaker than most of the other types. Still, it can be concluded that metacognitive strategies were systematically conducted to the treatment group in this strategy, which is not true for the control group

from the same context. That means such strategies are often neglected in the accessible population. This may more or less have a positive effect for the treatment.

With this in hand, it can be seen above that the most facilitative strategies to semantic mapping, which is a Consolidation-Memory Strategy itself, are those in the Discovery-Social Strategy group. This is probably because of its being yet another strategy which dealt with obviously the most popular synset: synonymy. As cited Levin and Pinker (1991), Miller and Fellbaum mention the similarity of meaning as “the most important lexical relation” in the WordNet® model. Such a generalization can be assumed to be true for most EFL context as well. Therefore, it can be concluded that relevant supplementary practice responds in harmony with semantic mapping although its influence might be slight.

Another point worth mentioning is that there seems to be an inconsistency between the helpfulness rates of certain strategies provided in Schmitt’s inventory and their influence over semantic mapping. The statistics provided in the inventory may be viewed just as a reference, and may fluctuate from one society to another. There may even be no significant difference between one strategy to another when used as a supplementary strategy no matter how often they are used or how influential they are viewed. Having a variety of strategies to be shifted occasionally may be a key point to be concluded for a better practice.

Research Question 4

Is there a significant difference between the vocabulary sizes of EFL learners who received a treatment on the mapping of lexical semantic relations than those of other EFL learners?

The former research towards Nation’s Vocabulary Size Test suggests that non-native speakers of non-European backgrounds successfully coping with study at an English speaking university have a vocabulary size around 5,000-6,000 word families (Nation, 2012). Applied as the pre-test for vocabulary known, the scores of the non-native test-takers in this current study were correlative with mean scores over 5000 without a noteworthy difference. Even though Nation concluded that undergraduate non-native speakers of non-European backgrounds can successfully cope with study at an English speaking university withh a vocabulary size around 5,000-6,000 word families, the case is not so in the accessible population of this current study. Based on the observation, they usually think that they know the words that they are tested, but

what they know is limited especially with the definition or the L1 translation of the word in target language. Therefore, the suggested vocabulary size, which was already met by the participants of the pre-test, seems to be sufficient in such an EFL context.

The previous statistics from Nation also concluded that an average 13 year-old native speakers' vocabulary size is round 10,000-11,000. A non-native PhD student usually knows approximately 9,000. Furthermore, the vocabulary size needed for children's movies is 6,000, for spoken English 7,000, for newspapers 8,000 and 9,000 for novels. The corresponding learning procedures are "reading graded readers" and "deliberate teaching and learning" for 1,000-2,000 word family level, "reading mid-frequency readers" and "deliberate learning" for 3,000-9,000, and "wide reading and "specialized study of a subject area" for 10,000 and more. Deliberate learning is a very broad expression, and herein stems the need for practical vocabulary learning strategies which may stimulate these levels. Therefore, it was aimed in this study to increase the vocabulary size of the treatment group, at least upto 8,000 word families, which is critical in that this size can be regarded as high enough for deliberate learning, and also close to the size needed for specialized study in their further academic years. The goal of around 8,000 word families is also regarded by Nation to be an important one for learners who wish to deal with a range of unsimplified spoken and written texts, and it is thus helpful to know how close learners are to this critical goal.

When examined, the post-test results refer to such a boost in the mean scores for the treatment group. Although there is a superficial increase in the post-test scores of the control group as well, it should be considered nothing but what is supposed to be in routine pedagogical procedure. After all, the first evidence of vocabulary learning (the learning of word forms) is assumed to takes place after 14 hours of exposure to the target language in a classroom setting based on the former research (McLaughlin, Osterhout and Kim, 2004, p.703). However, the findings also indicated that learners can only become sensitive to the semantic properties of the foreign language words after approximately 60 hours of exposure. Those durational results from the 2004 study indicates that the control group of this previous study most probably got a better score in the post-test, though superficially, and it was for the sake of being exposed to the target words more as time went on. They may also have failed to boost their mean score simply because of not considering semantic properties as much as in the treatment group.

The mean score of the treatment group from the post-test penetrated into the vocabulary size of 8,000 word families, missing an upper level marginally. That may be paraphrased as semantic mapping can provide a mental lexicon enough to comprehend newspaper texts. Furthermore, semantic memory necessary for academic career may be enhanced through the same way since this size is viewed as a threshold to deal with most unsimplified spoken and written texts. It can also be concluded that the participants realized what “knowing” a word really means. Trust for individual vocabulary knowledge must also have contributed to the self-reliance of the participants.

Research Question 5

What is the direction of the EFL learners' overall attitude towards the mapping of lexical semantic relations?

The basic indication of the inquiries directed in the descriptive phase was to elaborate the self-reliance stated above. The overall view of the EFL learners towards the practice can be stated as positive at the end of the procedure. It can be inferred from the comments that studying synsets through semantic maps was like a matryoshka doll; further words derived from the words which were intended to be learned. As they keep resolving the words, it resulted in new nodes in lexical schemata. This conclusion is parallel to what Reber suggested (1980, p. 492) in that the acquisition process itself contains at its core an induction process whereby relations among parts of the stimulus environment are mapped in an order that corresponds roughly with the ecological salience of these relations.

Some participants highlighted that they grasped where to focus while studying vocabulary, which means their having semantic awareness. For this reason, semantic mapping did not only serve as a memory strategy, but it also assisted to the metacognition of the participants since it provided further cognition in terms of what a word has around itself in the mental schemata. As known, the strategy was a hybrid of a number of memory strategies in Schmitt's taxonomy (1997) such as “associating the word with its coordinates”, connecting the word to its synonyms and antonyms”, and “using semantic maps”. However, when these strategies came together as in the treatment of this study, it also assisted learners to learn how “to learn” vocabulary through relating words semantically. Therefore, it can also be concluded that mapping

of lexical semantic relations can also be used as a metacognitive strategy if structured in an appropriate way as in this current study.

The only inconvenience expressed directly was an expectation of more example sentences complementing this demanding semantic process. In spite of using ample examples such as audio-visual means, syntactic constituents are usually welcomed by EFL learners. Still, there appears to be a need for corpus reinforcement into the procedure.

Most of the members of the treatment group are of the opinion that lexical semantic relations can best be learned through semantic mapping as carried out in this study. Although the comments were initially on the learning of the most common synsets like synonyms and antonyms, other synsets were also mentioned. Most learners know these synsets implicitly, but categorization of these relations via concrete terminologies might have eased the complexity of vocabulary learning.

A last point to be considered is the effort which was put in this practice. Seeing their EFL instructor eager and ambitious to find a better alternative to teach vocabulary might have had a positive influence, and probably pressure over the learners. As a result, they pronounced their gratitude. Those positive tenets and even the negative one can be interpreted to the constructive framework of semantic mapping. Teachers of foreign languages should be aware of the fact that learners, regardless of how old or how young they are, are beings each with a similar complex processing system called memory, but with different individual characteristics. With this in mind, they should at least be guided how to use this mechanism more effectively, but also should be enriched with a variety of other supplementary means in order to avoid stereotypical paths which may address to some but not to the others.

5.4. Implications of the Study

This study served the purpose of eliciting information about a series of vague issues related to vocabulary learning in EFL context. The vocabulary instruction was devoid of semantic qualities in the accessible population. Therefore, it seemed to trigger a domino effect in the semantic memory affecting the vocabulary learned initially, and then the vocabulary known and stored in the mental lexicon. Mapping of lexical semantic relations as a vocabulary learning strategy filled these semantic gaps in lexical schemata since these nodes tie synsets together.

Another indication of the practice is towards putting the theoretical content over semantic maps into practice. As Oxford (1990) acknowledges, lexical semantic relations and other sense relationships can be illustrated with semantic maps, which are often used to help consolidate vocabulary. However, there seemed to be a lack of scientific study in the related literature investigating the effects of semantic maps designed using lexical semantic relations over the vocabulary learning in EFL context as well as its impact over the vocabulary known. This current study can be regarded as a demonstration of Oxford's guidance in foreign language vocabulary education, and it acknowledges the appropriateness of her suggestion.

On the other hand, it can be seen in Schmitt's (1997) taxonomy of vocabulary learning strategies that semantic maps are presented among the least used practices with a percentage of helpfulness below average. Despite its being a popular reference of vocabulary strategies, the question on how a certain strategy such as semantic maps is applied in a foreign language classroom context represents a noteworthy point to be considered while determining how useful it is. With this study, the scope of semantic maps was revisited. EFL educators and also learners are hopefully supplied with the technical details to be exploited such as what to map and how to illustrate it. The participants found the opportunity to visualize their idiosyncratic semantic knowledge. Additionally, they were provided with unabridged resources like WordNet® whenever their mental lexicon fell short of synsets in certain cases, rather than the limited structure of dictionaries. All in all, it is seen that how a strategy is modified and practiced determines its contributions. This indication may also refer to the other strategies in the inventory, meaning it should only be considered as a reference and the rates is open for update integrating more contemporary modifications to certain strategies.

A final remark about the implications can be the identification of other compatible strategies with semantic mapping. Despite their insignificant variations from the others, strategies which emphasize social, cognitive and other semantic aspects are better to be used as supplementary strategies. Social strategies may be regarded as necessary means of scaffolding while cognitive strategies naturally deal with semantic memory. Still, no single strategy is meant to be less valuable, but might not serve as a panacea eternally.

5.5. Recommendations for Further Research

One of the core issues in this research was raising foreign language learners' semantic awareness. There are several tenets to be considered by both learners and educators in this respect. A fundamental example can be the materials being used. In most EFL classrooms, there exists a monopoly of centralized resources and individuals often reckon more on these ready-made materials than their own performance. Relating words, for instance, obviously requires more of personal experience than linguistic competence. Any further material to enhance learners' performance through the use of their own knowledge both individually and socially is the first and the wide-spectrum argument to be stated at the outset.

In parallel with what is stated above, an EFL learner-based project similar to WordNet® and administered by experts is highly recommended both at institutional level and global level. This might also include learner corpora as the insufficiency of example sentences was a prominent criticism in this current study. By doing so, much data would be obtained from individuals' perspective. Therefore, the more data is included, the better schemata might be derived. The professionals can also benefit from such a database while producing EFL materials.

A further remark is towards Schmitt's inventory. As it is known, the percentages of use and helpfulness in it are basically references rather than absolutely proven facts which can never show change. Therefore, investigations towards how to fluctuate the strategies in this inventory in a positive direction may be an invaluable contribution to the vocabulary instruction. Meanwhile, it is also possible to add new strategies in the literature of vocabulary learning or teaching.

Last but not least, the use of semantic mapping should not have boundaries since the lexemes are active as well. For this reason, other implementations might be considered trying for the illustration of lexical semantic relations. Such additions would nothing but enrich the scope of this vocabulary learning strategy.

5.6. Personal Reflections and Criticism of the Research

This study brought about some drawbacks as well as contributions. One of these troublesome issues was the ambiguity of certain terms in the literature. For instance, the prolonged debate between polysemy and homonymy spread out to applied levels raising question marks. Troponymy was another source of conflict from time to time since it

was exclusive for verbs unlike the other parts of speech which are categorized merely under the heading of hyponymy on the whole.

The demanding nature of semantic mapping for each and every word of a whole semester was probably the most challenging part of the study aside from all others. At this point, further researchers might envisage this overload and ask other colleagues for collaboration rather than an individual attempt. The harvest attained in the end deserves this endeavor nevertheless as there was an evident difference between the levels of the mental lexicon of the treatment group and their counterparts. It was an enterprise to see the bijou elements of lexicon rather than to look at the whole frame.

REFERENCES

- Alba, J. W., & Hasher, L. (1983). Is Memory Schematic. *Psychological Bulletin*, 93 (2), 203-231.
- Alloway, T. P., & Alloway, R. G. (2010). Investigating the Predictive Roles of Working Memory and IQ in Academic Attainment. *Journal of Experimental Child Psychology*, 106 (1), 20-29.
- Anderson, N. J. (2002). *The Role of Metacognition in Second Language Teaching and Learning*. ERIC DIGEST.
- Anderson, R. C. (1984). Role of the reader's schema in comprehension, learning, and memory. In R. C. Anderson, J. Osborn, & R. J. Tierney (Eds.), *Learning to Read in American Schools: Basal Readers and Content Texts* (243-266). Broadway, New Jersey: Lawrence Erlbaum Associates.
- Anderson, R. C. (1977). The notion of schemata and the educational enterprise: General discussion of the conference. In R. C. Anderson, & R. J. Spiro (Eds.), *Schooling and the acquisition of knowledge* (415–431). New Jersey.
- Anderson, R. C., & Pearson, P. D. (1984). *A schema-theoretic view of basic processes in reading comprehension*. In P. D. Pearson (Ed.). New York: Longman Inc.
- Anderson, R. C., Spiro, R. J., & Anderson, M. C. (1978). Schemata as Scaffolding for the Representation of Information in Connected Discourse. *American Educational Research Journal*, 434.
- Anderson, R. C., William, E. N., & Patricia, A. H. (1987). Learning Word Meanings from Context during Normal Reading. *American Educational Research Journal*, 237-270.
- Asiyaban, A. R., & Bagheri, M. S. (2012). Does Translation Contribute to Learners' Free Active Vocabulary? *Pan-Pacific Association of Applied Linguistics*, 16 (1), 111-121.
- Atkinson, R. C., & Shiffrin, R. M. (1968). Human Memory: A Proposed System and its Control Processes. In *Psychology of Learning and Motivation* (Vol. 2, 89-195). California: Elsevier Inc.
- Auday, B. C., & Schafer, E. D. (2014, January). *Sensory memory*. Salem Press Encyclopedia of Health.
- Auwer, J. v., & Temürçü, C. (2006). Semantic Maps. In *Encyclopedia of Language and Linguistics* (131-134). Antwerp: Elsevier Ltd.

- Axelrod, R. (1973). Schema Theory: An Information Processing Model of Perception and Cognition. *The American Political Science Review*, 1248-1266.
- Baddeley, A. (2006). Working Memory: An Overview. In S. J. Pickering, & G. D. Phye, *Working Memory and Education*(1-31). Academic Press.
- Baddeley, A.,& Hitch, G. (1974). Working Memory. In G. H. Bower, *The Psychology of Learning and Motivation* (47-89). New York: Academic Press.
- Baker, A. A. (2006). *Native speaker - non-native speaker interaction in synchronous computer-mediated communication*. Ottawa: UMI Dissertations Publishing.
- Bakken, K. (2006). Lexicalization. In *Encyclopedia of Language and Linguistics*(106-108). Oslo: Elsevier Ltd.
- Bartlett, F. C. (1932). *Remembering: A study in experimental and social psychology*.Cambridge: Cambridge University Press.
- Belacchi, C., Benelli, B., & Dispaldo, M. (2013). Semantic represenatation and verbal working memory: The impact of schematic knowledge on word recall in children at different age levels. *Bolettino di Psicologia Applicata*, 13-28.
- Bellezza, F. S. (1983). The Spatial-Arrangement Mnemonic. *Journal of Educational Psychology*, 75 (6), 830-837.
- Bergenholtz, H.,& Agerbo, H. (2014). There is No Need for the Terms Polysemy and Homonymy in Lexicography. *Lexikos* (24), 27-35.
- Bugelski, B. R. (1970). Words and Things and Images. *American Psychologist*, 1002-1012.
- Carroll, D. W. (2008). *Psychology of language*. Belmont: Thomson Wadsworth.
- Casale, M. B.,& Ashby, F. G. (2008). A role for the perceptual representation memory system incategory learning. *Perception & Psychophysics*, 70 (6), 983-999.
- Chamberlin-Quinlisk, C. (2010). Language learner/native speaker interactions: exploring adaptability in intercultural encounters. *Intercultural Education*, 21 (4), 365-377.
- Chomsky, N. (1968). *Language and mind*. New York: Harcourt, Brace & World.
- Chomsky, N. (1995). *Language and nature*. Mind Association.
- Chomsky, N.,& Lasnik, H. (1993). The theory of principles and parameters. In J. Jacobs (Ed.), *Syntax: An International Handbook of Contemporary Research*(Vol. 1, 506-569). Walter de Gruyter.
- Colman, A. E. (2009). *A dictionary of psychology*.Oxford University Press.

- Common European Framework of Reference for Language: Learning, Teaching, Assessment. (2011). Retrieved from Council of Europe: http://www.coe.int/t/dg4/linguistic/source/framework_en
- Conway, M. A. (2009). Episodic memories. *Neuropsychologia* (47), 2305–2313.
- Cook, L. K., & Mayer, R. E. (1983). Reading Strategies for Meaningful Learning from Prose. In M. Pressley, & J. Levin (Eds.), *Cognitive Strategy Research*. New York: Springer.
- Cowan, N. (1997). *Attention and memory*. New York: Oxford University Press.
- Cowan, N. (2009). What are the differences between long-term, short-term, and working memory? *Progress in Brain Research*, 323-338.
- Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches*. California: Sage Publications.
- Cristofaro, S. (2010). Semantic maps and mental representation. *Linguistic Discovery*, 8 (1), 35.
- Crotty, M. (1998). *The foundations of social research: Meaning and perspective in the research process*. California: Sage Publications Ltd.
- Crowder, R. G., & Morton, J. (1969). Precategorical acoustic storage. *Perception and Psychophysics* (5), 565-573.
- Cysouw, M. (2010). Semantic Maps as metrics on meaning. *Linguistic Discovery*, 8 (1), 70-95.
- Dacin, P. A., & Mitchell, A. (1986). The Measurement of Declarative Knowledge. *Advances in Consumer Research*, 454-459.
- Dehn, M. J. (2008). *Working memory and academic learning*. New Jersey: John Wiley and Sons Inc.
- Dobao, A. F. (2014). Vocabulary learning in collaborative tasks: A comparison of pair and small group work. *Language Teaching Research*, 18 (4), 497-520.
- Dörnyei, Z. (2011). *Research methods in applied linguistics*. Oxford: Oxford University Press.
- Dörnyei, Z., & Scott, M. L. (1997). Communication Strategies in a Second Language: Definitions and Taxonomies. *Language Learning*, 173-210.
- Fazeli, S. H. (2012). The role of personality traits in the choice and use of the compensation category of English language learning strategies. *Indian Journal of Science and Technology*, 2938-2944.

- Fellbaum, C. (2002). On the semantics of troponymy. In R. Green, S. Myang, & C. Bean, *Relations* (23-34). Dordrecht: Kluwer.
- Fellbaum, C. (2005). *WordNet: A lexical database for English*. Retrieved 2014, from Princeton University: <http://wordnet.princeton.edu/>
- Fellbaum, C. (1998). *WordNet: An electronic lexical database*. Cambridge: The MIT Press.
- Gathercole, S. E., Pickering, S. J., Ambridge, B., & Wearing, H. (2004). The Structure of Working Memory From 4 to 15 Years of Age. In *Developmental Psychology*(Vol. 40, 177-190). American Psychological Association Inc.
- Gelpi, C. (2004). Reliability of online bilingual dictionaries. In M.-C. L' Homme (Ed.), *Dictionary Visions, Research and Practice: Selected papers from the 12th International Symposium on Lexicography, Copenhagen 2004* (3-11). Amsterdam, Philadelphia: John Benjamins Publishing Company.
- Gouin, F. (1892). *The art of teaching and studying languages*. New York: George Philip & Son.
- Grenfell, M. (2000). Learning and teaching strategies. In S. Green (Ed.), *New Perspectives on Teaching and Learning Modern Languages* (1-23). Multilingual Matters Ltd.
- Grenfell, M., & Harris, V. (1999). *Modern languages and learning strategies in theory and practice*. London: Routledge.
- Gupta, A. (2002). Meaning and misconceptions. In R. S. Jackendoff, P. Bloom, & K. Wynn (Eds.), *Language, Logic, and Concepts*(15-42). Bradford Books.
- Hannay, M. (2003). Types of bilingual dictionaries. In P. v. Sterkenburg (Ed.), *A Practical Guide to Lexicography*(145-154). John Benjamins Publishing Company.
- Hart, J. J., & Kraut, M. A. (2007). *Neural basis of semantic memory*. Cambridge: Cambridge University Press.
- Hasselmo, M. E. (2012). *How we remember: Brain mechanisms of episodic memory*. Cambridge: The MIT Press.
- Hill, O. W. (2014). *Long-term memory*. Salem Press Encyclopedia of Health.
- Holtzer, G. (2010). Learning culture by communicating: native–non-native speaker telephone interactions. *Language, Culture and Curriculum*, 235-242.
- Hsu, J.-y. (2006). *An analysis of the multiword lexical units in contemporary ELT Textbooks*. Kaohsiung: ERIC.

- Hudson, R. (2010). *An introduction to Word grammar*. Cambridge: Cambridge University Press.
- Humboldt, V. v. (1999). *On Language (Vol. Cambridge Texts in the History of Philosophy)*. (M. Losonsky, Ed., & P. Heath, Trans.) Cambridge University Press.
- Hummel, K. M. (2010). Translation and short-term L2 vocabulary retention: Hindrance or help? *Language Teaching Research*, 14 (1), 61–74.
- Huong, L. P. (2006). Learning vocabulary in group work in Vietnam. *RELJ Journal: A Journal of Language Teaching and Research*, 37 (1), 105-121.
- Janulevičienė, V., & Kavaliauskienė, G. (2007). Self-assessment of vocabulary and relevant language skills for evaluation purposes. *Coactivity / Santalka*, 10-15.
- Kant, I. (1781). *The critique of pure reason*. (J. M. MEIKLEJOHN, Trans.) Konigsberg.
- Khoii, R., & Sharififar, S. (2013). Memorization versus Semantic Mapping in L2 vocabulary acquisition. *ELT Journal*, 67 (2), 199-209.
- Knowlton, B. J., & Squire, L. R. (1995). Remembering and Knowing: Two Different Expressions of Declarative Memory. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 21 (3), 699-710.
- Kornell, N., & Son, L. K. (2009). Learners' choices and beliefs about self-testing. *Memory*, 17 (5), 493-501.
- Kubovy, M., & Howard, F. P. (1976). Persistence of a Pitch-Segregating Echoic Memory. *Journal of Experimental Psychology: Human Perception and Performance*, 2(4), 531-537.
- Lago, L., & Seepho, S. (2012). Brain-Compatible activities for EFL vocabulary learning and retention. *Vocabulary Learning Strategies and Foreign Language Acquisition*, 1-6.
- Langacker, R. W. (1994). Cognitive Grammar. In *Encyclopedia of Language and Linguistics* (590-593). Elsevier Ltd.
- Leech, G., Cook, V., Crombie, W., Ikegami, Y., Meara, P., O'Neill, R., et al. (Eds.). (1997). *Language activator*. Essex, England: Longman.
- Lew, R., & Adamska-Sałaciak, A. (2014). A case for bilingual learners' dictionaries. *Oxford Journals*, 47-57.
- Lujan, E. R. (2010). Semantic maps and word formation: agents, instruments, and related semantic roles. *Linguistic Discovery*, 8 (1), 162.
- Lyons, J. (1977). *Semantics*. New York: Cambridge University Press.

- Macaro, E. (2001). *Learning strategies in foreign and second language classrooms*. London: Continuum.
- MacLennan, C. H. (1991). *Media, metaphor and english language teaching*. ERIC.
- Maglic, M. (2007). Media education in english language teaching -not our job? *Novitas Royal: Research on Youth and Language*, 1 (1), 1-9.
- Maillet, L. J. (1972). *A schematic perspective of memory*. Moncton, Canada: ProQuest LLC.
- Malley, J. M., & Chamot, A. U. (1990). *Learning strategies in second language acquisition*. Melbourne: Cambridge University Press.
- Marbella, J. (1994, May 12). Learning In A Flash Is In Cards. *The Baltimore Sun*. Fort Lauderdale, United States: Tribune Publishing Company LLC.
- Mastin, L. (2010). *Types Of Memory*. Retrieved January 28, 2015, from The Human Memory: <http://www.human-memory.net/types.html>
- McCabe, J. (2010). Metacognitive awareness of learning strategies in undergraduates. *Psychonomic Society, Inc* (39), 462-476.
- McKee, R. D., & Squire, L. R. (1993). On the development of declarative memory. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 19 (2), 397-404.
- McLaughlin, J., Osterhout, L., & Kim, A. (2004). Neural correlates of second-language Word Learning: Minimal instruction produces rapid change. *Nature Neuroscience* (7), 703-704.
- McVee, M. B., Dunsmore, K., & Gavelek, J. R. (2005). Schema Theory Revisited. *Review Of Educational Research*, 75 (4), 531-566.
- Miller, G. A., & Fellbaum, C. (1991). Semantic networks of English. In B. Levin, & S. Pinker, *Lexical and conceptual semantics* (197-229). Oxford: Blackwell.
- Miller, G. A., Galanter, E., & Pribram, K. H. (1960). *Plans and the structures of behavior*. Bucks: Holt, Rinehart and Winston Inc.
- Moro, A. (2008). *The boundaries of Babel: The Brain and the Enigma of impossible languages*. Cambridge, Massachusetts: The MIT Press.
- Murphy, L. M. (2003). *Semantic relations and the lexicon*. New York: Cambridge University Press.
- Murphy, M. L. (2006). Antonymy and Incompatibility. in *encyclopedia of language and linguistics* (p. 314). Sussex: Elsevier Ltd.

- Murphy, M. L. (2006). Hyponymy and Hyperonymy. *In Encyclopedia of Language and Linguistics* (p. 446). Sussex: Elsevier Ltd.
- Murphy, M. L. (2006). Meronymy. *In Encyclopedia of Language and Linguistics* (p. 15). Sussex: Elsevier Ltd.
- Murphy, M. L. (2006). Synonymy. *In Encyclopedia of Language and Linguistics* (p. 376). Sussex: Elsevier Ltd.
- Murphy, M. L., & Koskela, A. (2006). Polysemy and Homonymy. *In Encyclopedia of Language and Linguistics* (p. 742). Sussex: Elsevier Ltd.
- Müller, H. M. (2010). Neurolinguistic findings on the language lexicon: the special role of proper names. *The Chinese Journal of Physiology*, 351-358.
- Nakashioya-Nishimura, N.-N. J. (1992). Professional Materials -- Power Words. *Journal of Reading*, 35 (8), 690-691.
- Nakata, T. (2008). English vocabulary learning with word lists, word cards and computers: implications from cognitive psychology research for optimal spaced learning. *ReCALL*, 20 (1), 3-20.
- Nation, I. S. (1990). *Teaching and learning vocabulary*. New York: Newbury House.
- Nation, P. (2012, October 23). *The vocabulary size test*.
- Nerlich, B. (2006). Metonymy. *In Encyclopedia of Language and Linguistics* (p. 108). Nottingham: Elsevier Ltd.
- Nolen, J. L. (2014). *Mnemonic*. In Encyclopædia Britannica.
- Noordman-Vonk, W. (1979). Retrieval from Semantic Memory. In W. J. Levelt, *Springer Series in Language and Communication* 5(1-93). Nijmegen: Springer.
- O'Malley, J. M., Chamot, A. U., Stewner-Manzanares, G., Russo, R. P., & Küpper, L. (1985). Learning Strategy Applications with Students of English as a Second Language. *TESOL Quarterly*, 19(3), 557-584.
- Oxford, R. (1990). *Language learning strategies*. Massachusetts: Heinle & Heinle Publishers.
- Pavlik Jr., P. I., & Anderson, J. R. (2005). Practice and Forgetting Effects on Vocabulary Memory: An Activation-Based Model of the Spacing Effect. *Cognitive Science*, 559-586.
- Pei, L. (2014). Does Metacognitive Strategy Instruction Indeed Improve Chinese EFL Learners' Reading Comprehension Performance and Metacognitive Awareness? *Journal of Language Teaching and Research*, 5 (5), 1147-1152.

- Phan, L. H. (2014). The politics of naming: critiquing “learner-centred” and “teacher as facilitator” in English language and humanities classrooms. *Asia-Pacific Journal of Teacher Education*, 392-405.
- Phillips, L. U. (2013). *Semantic memory*. In *Research Starters*. Salem Press Encyclopedia.
- Pickering, S. J., Gathercole, S. E., Hall, M., & Lloyd, S. A. (2001). Development of Memory for Pattern and Path: Further Evidence for the Fractionation of Visuo-spatial Memory. *The Quarterly Journal Of Experimental Psychology*, 54A (2), 397-420.
- Pinker, S. (1999). *Words and Rules*. New York: HarperCollins.
- Pliatsikas, C., Johnstone, T., & Marinis, T. (2014). fMRI Evidence for the Involvement of the Procedural Memory System in Morphological Processing of a Second Language. *PLoS ONE*, 1-9.
- Poirier, M., Saint-Aubin, J., Mair, A., Tehan, G., & Tolan, A. (2014). *Order recall in verbal short-term memory: The role of semantic networks*. Psychonomic Society.
- Purpura, J. E. (1994). The Role of Learner Strategies in Language Learning and Testing. *Thai TESOL Conference*. Bangkok: TESOL.
- Qing, M. (2012). Matching vocabulary learning process with learning outcome in L2 academic writing: An exploratory case study. *Linguistics and Education*, 24 (2), 237-246.
- Quirk, R., Greenbaum, S., Leech, G., & Svartvik, J. (1987). *A Comprehensive Grammar of the English Language*. Essex: Longman.
- Reber, A. S., Kassin, S. M., Lewis, S., & Cantor, G. (1980). On the Relationship Between Implicit and Explicit Modes in the Learning of a Complex Rule Structure. *Journal of Experimental Psychology: Human Learning and Memory*, 6 (5), 492-502.
- Reuter-Lorenz, P. A., & Jonides, J. (2007). The Executive is Central to Working Memory: Insights from Age, Performance, and Task Variations. In A. R. Conway, C. Jarrold, M. J. Kane, A. Miyake, & J. N. Towse (Eds.), *Variation in Working Memory* (250- 271). OxfordUniversity Press.
- Richard, A. C., Nagy, W. E., & Herman, P. A. (1987). Learning word meanings from context during normal reading. *American Educational Research Association*, 237- 270.

- Richards, J. C., & Schmidt, R. (2002). *Longman dictionary of language teaching and applied linguistics*. Norfolk: Pearson Education Limited.
- Riemer, N. (2010). *Introducing semantics*. New York: Cambridge University Press.
- Riemer, N. (2010). *Introducing semantics*. New York: Cambridge University Press.
- Rudzka, B., Channell, J., Putseys, Y., & Ostyn, P. (1987). *The words you need*. Hong Kong: MacMillan Publishers.
- Sanchez, R. C. (2009). The Distribution of the Lexical Component in ELT Coursebooks and Its Suitability for Vocabulary Acquisition from a Cognitive Perspective. A Case Study. *International Journal of English Studies*, 39-60.
- Sandberg, E. T. (1955). Written Repetition-An Aid in Spelling Improvement. *College English*, 16 (5), 305-307.
- Sankary, D. (2013). Role of rote learning as an ESL learning strategy. *Language in India*, 13 (7), 441.
- Schacter, D. L. (1990). Perceptual representation systems and implicit memory: Toward a resolution of the multiple memory systems debate. In I. Diamond (Ed.), *The development and neural basis of higher cognitive functions* (543-571). New York: New York Academy of Sciences.
- Schacter, D. L. & Tulving, E. (1994). What are the Memory Systems of 1994. In D. L. Schacter, & E. Tulving, *Memory Systems* (2-38). London: The MIT Press.
- Schmitt, N. (1997). Vocabulary learning strategies. In N. Schmitt, & M. McCarthy, *Vocabulary: Description, Acquisition, and Pedagogy*. Cambridge University Press.
- Schmitt, N., Schmitt, D., & Clapham, C. (2001). Developing and exploring the behaviour of two new versions of the Vocabulary Levels Test. *Language Testing*, 18-55.
- Sim, M. A., & Pop, A. M. (2014). The Impact of Social Media on Vocabulary Learning Case Study- Facebook. *Annals of the University of Oradea, Economic Science Series*, 120-130.
- Smelley, J., & Joel, A. (2013). Rote Learning: a Reviewed Strategy for Religious Instruction. *Christian Education Journal*, 309-321.
- Smith, E. E., & Kosslyn, S. M. (2006). Executive Processes. In E. E. Smith, & S. M. Kosslyn, *Cognitive Psychology: Mind and Brain* (280-324). Pearson.

- Sockett, G. (2012). *The Learner, the Media and the Community: How Does Learning Take Place in the Other CALL Triangle? European Association for Computer-Assisted Language Learning (EUROCALL)*. ERIC.
- Sontag, M. E. (2007). *Facilitating learning transfer through students' schemata*. Ann Arbor: UMI.
- Sperling, G. (1967). Successive approximations to a model for short-term memory. *Acta Psychologica* (27), 285-292.
- Sperling, G. (1960). The Information Available in Brief Visual Presentations. *Psychological Monographs: General and Applied*, 1-29.
- Spitzer, B., & Bäuml, K.-H. (2009). Retrieval-Induced Forgetting in a Category Recognition Task. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 286-291.
- Spolsky, B. (1989). *Conditions for second language learning*. Oxford: Oxford University Press.
- Squire, L. R., & Zola, S. M. (1996). Structure and function of declarative and nondeclarative memory systems. In P. S. Goldman-Rakic (Ed.), *Memory: Recording Experience in Cells and Circuit*. (pp, 93). 13515-13522. Irvine, CA.: The National Academy of Sciences.
- Squire, L. R., Knowlton, B., & Musen, G. (1993). The Structure and Organization of Memory. *Annual Review of Psychology* (44), 453-495.
- Storch, N., & Aldosari, A. (2010). Learners' use of first language (Arabic) in pair work in an EFL class. *Language Teaching Research*, 14 (4), 355-375.
- Storjohann, P. (2010). *Lexical-Semantic relations: Theoretical and practical perspectives*. Philadelphia: John Benjamins Publishing Company.
- Szpunar, K. K., Addis, D. R., McLelland, V. C., & Schacter, D. L. (2013, May 23). *Memories of the future: new insights into the adaptive value of episodic memory*.
- Tagashira, K., Kida, S., & Yuko, H. (2010). Hot or gelid? The influence of L1 translation familiarity on the interference effects in foreign language vocabulary learning. *System*, 38 (3), 412-421.
- Takač, V. P. (2008). *Vocabulary learning strategies and foreign language acquisition*. Clevedon: Multilingual Matters Ltd.
- Teacher, D. (2000, March 19). *Making flash cards enhances learning process*. Grand Rapids Press, J3. Grand Rapids, Mich., United States.

- Test your word knowledge. (2014). Retrieved from <http://my.vocabularysize.com/>
- Tulving, E. (1985). Memory and consciousness. *Canadian Psychologist* (26), 1-12.
- Tulving, E. (1972). *Organization of memory*. New York: Academic Press.
- Tulving, E. (1993). What Is Episodic Memory? *American Psychological Society*, 67-70.
- Tulving, E. (1986). What Kind of a Hypothesis Is the Distinction Between Episodic and Semantic Memory? *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 12 (2), 307-311.
- Wallace, S. (2009). *A dictionary of education*. Oxford University Press.
- Wang, J.-h. T., & Good, R. L. (2007). *The repetition of collocations in EFL textbooks: A corpus study*. Taipei: ERIC.
- White, L. (2003). *Second language acquisition and universal grammar*. New York: Cambridge University Press.
- Wissman, K. T., Rawson, K. A., & Pyc, M. A. (2012). How and when do students use flashcards? *Memory*, 20 (6), 568-579.
- Wolfinger, D. M. (2006). A New Use for Semantic Maps. *Science & Children*, 43 (4), 48-51.
- Wolters, A. W. (1933). Remembering: A Study in Experimental and Social Psychology [Book Review]. *Philosophy*, 31 (8), 374.
- Zhang, X. (2013). The I Don't Know Option in the Vocabulary Size Test. *TESOL Quarterly*, 47 (4), 790-811.
- Zipp, G., & Maher, C. (2013). Prevalence of mind mapping as a teaching and learning strategy in physical therapy curricula. *Journal of the Scholarship of Teaching and Learning*, 13 (5), 21-32.

APPENDICES

Appendix I: A simplified student manual of lexical semantic relations with examples

I. "... has a ..." Relation

Bu ilişki türü, genelde kelimeler arasında parça bütün ilişkisinden söz ederken kullanılır.

A. Hierarchical Relations

Ast-üst ilişkisi:

1. **Holonyms (bütünsel kelimeler): A holonym has parts, ingredients, or pieces as subsets. For example,**

The piano has keys. (The piano is the holonym)

Bu tür kelimeler; parçaları, muhteviyatı veya bölümleri olan kelimelerdir. Örneğin, piyano, parçaları olduğu için bir holonym'dir.

2. **Meronyms (parçacık kelimeler): A meronym is the part, ingredient or piece of another referent. For example,**

The piano has keys. (Keys is the meronym of the piano)

Bu tür kelimeler; bir bütüne ait parçalar, içerikler ya da bölümlerir. Yani, holonym'in tam tersidir. Ancak, bir kelime bir başka kelimenin parçası olabildiği gibi, diğer bir kelimenin de bütünü olabilir. Yani bir kelime bir yandan holonym, öte yandan meronym olabilir. Fakat, her kelime böyle değildir. Örneğin, tuş, piyanonun bir parçasıdır ve bir meronym'dir.

II. "...is a ..." Relation

Bu tür ilişkiler, daha çok tür; çeşit ilişkilerini bildirir.

A. Hierarchical Relations

Ast-üst ilişkisi

1. **Troponyms(nitelikli fiil): A troponym is a verb which indicates more precisely the manner of doing something by replacing a verb of a more generalized meaning. For example,**

The student handed in his homework yesterday. (hand in means to give sth to an authority, so it is a troponym of give; it is more specific than give)

Bu türden kelimeler, sadece fiilleri kapsar; yani bir troponym her zaman fiildir. Bazı iş, oluş ya da hareketleri kimi fiiller, diğer emsallerine göre çok daha net ifade eder.

Örneğin, “uğraşmak” fiilindense, “didinmek” fiili çok daha özel (spesifik) bir boyuttadır.

2. Hyponyms (alt sözcük): A hyponym is a kind of a subordinate term. For example,

Green apple is a kind of apple. (green apple is the hyponym of apple)

Bir kelime ya da kelime grubu, bir başka kelimenin alt kategorisinde ise; yani bir türü ise o kelimeye hyponym denir. Örneğin, yeşil elma bir elma türü olduğu için elmanın hyponym’i olur.

3. Hyperonyms (üst sözcük): A hyperonym is a superordinate term which includes subsets. It is the opposite of hyponym. For example,

Rose is a flower. (flower is a hyperonym here)

Hyponym’in tam tersidir. Üst gruba karşılık gelen kelimeye veya kelime grubuna verilen addır. Örneğin, gül bir çiçek olduğuna göre, çiçek bir hyperonym’dır.

B. Non-Hierarchical Relations

Ast-üst ilişkisi aranmayan ilişkiler

1. Metonyms (mecaz-ı mürsel/ad aktarması): A metonym is a word which has a certain meaning, but it often refers to an alternative meaning. For example,

The president invited the consuls to Çankaya. (Çankaya is a metonym and it refers to the presidential palace of Turkey)

Bazı durumlarda belirli bir sözcük ya da sözcük grubu, normalde anlaşılması gereken anlamlarından farklı anlamlara da karşılık gelirler. Örneğin, Çankaya denildiğinde anlaşılması gereken bir semt olsa da Türkiye Cumhuriyeti Devleti’ne ait bir yapı; dolayısıyla o yapıda görevlilere de karşılık gelmektedir. Diğer benzer örnekler, Hollywood, Yeşilçam, beyaz perde, beyaz cam, podyum, sahne...

2. Antonyms (zıt anlamlı): An antonym has an opposite meaning to another word. For example,

My coffee was cold when the waiter brought it. (cold is the antonym of hot)

Zıt anlamlı kelimelerdir. Zıt anlamın da kendine has çeşitleri vardır; tam zıt anlam vs. gibi. Mesela siyah ile beyaz tam zıt anlamlı kelimelerdir. Fakat çoğu durumda tam zıt anlam aranmaz. Örneğin, acı-tatlı, güneşli-yağmurlu...

3. Synonyms (Eş/yakın anlamlılar): A synonym is very close (if not the same) in terms of meaning of another word. For example,

Eş ya da yakın anlamlı sözcüklerdir. Örneğin, kuru yaprak-gazel.

I downloaded a software. (software is the synonym of computer program)

4. Polysemes(çok anlamlı): A polyseme is a word with different but related senses. For example,

Bir kelimenin birden çok, fakat birbirine ilişkin anlamları olabilir. Bu anlamlara polysemes denir. Örneğin, cep kelimesi, kıyafetlerde içine eşyalarımızı koyabildiğimiz bölüme denmekle beraber, otoyollarda araçların duraksadığı yerlere de denir. Bu anlamların her biri, diğerinin polyseme'idir.

He injured his shoulder during the match. (a body part)

The shoulders of the jacket are too tight. (the parts of a piece of clothing that cover the shoulders)

5. Homonyms (eş sesli ve/veya eşyazımlı sözcükler) : A homonym is one of group of words with the same form (punctuation and/or spelling), but different meanings. For example,

Eş sesli ya da yazılışı aynı olan kelimelere homonym denir.

He injured his shoulder during the match. (a body part)

The ambulance used the shoulder to bypass the traffic congestion. (a reserved lane on the side of a motorway)

Homographs: Yazılışı aynı olan kelimelerdir. (Örneğin, good (adj) – good (n))

Homophones: Eş sesli kelimelerdir. (Örneğin, knight – night)

Appendix II: A Taxonomy Of Vocabulary Learning Strategies

Strategy	Strategy	Use	Helpful
Group		%	%
<u>Strategies for the Discovery of a New Word's Meaning</u>			
DET	Analyze part of speech	32	75
DET	Analyze affixes and roots	15	69
DET	Check for L1 cognate	11	40
DET	Analyze any available pictures or gestures	47	84
DET	Guess from textual context	74	73
DET	Bilingual dictionary	85	95
DET	Monolingual dictionary	35	77
DET	Word lists	--	--
DET	Flash cards	--	--
SOC	Ask teacher for an L1 translation	45	61
SOC	Ask teacher for paraphrase or synonym of new word	42	86
SOC	Ask teacher for a sentence including the new word	24	78
SOC	Ask classmates for meaning	73	65
SOC	Discover new meaning through group work activity	35	65
<u>Strategies for Consolidating a Word Once it has been Encountered</u>			
SOC	Study and practice meaning in a group	30	51
SOC	Teacher checks students' flash cards or word lists for accuracy	3	39
SOC	Interact with native speakers	--	--
MEM	Study word with a pictorial representation of its meaning	--	--
MEM	Image word's meaning	50	38
MEM	Connect word to a personal experience	37	62
MEM	Associate the word with its coordinates	13	54

MEM	Connect the word to its synonyms and antonyms	41	88
MEM	Use Semantic maps	9	47
MEM	Use 'scales' for gradable adjectives	16	62
MEM	Peg Method	--	--
MEM	Loci Method	--	--
MEM	Group words together to study them	--	--
MEM	Group words together spatially on a page	--	--
MEM	Use new word in sentences	18	82
MEM	Group words together within a storyline	--	--
MEM	Study the spelling of a word	74	87
MEM	Study the sound of a word	60	81
MEM	Say new word aloud when studying	69	91
MEM	Image word form	32	22
MEM	Underline initial letter of the word	--	--
MEM	Configuration	--	--
MEM	Use Keyword Method	13	31
MEM	Affixes and Roots (remembering)	14	61
MEM	Part of Speech (remembering)	30	73
MEM	Paraphrase the words meaning	40	77
MEM	Use cognates in study	10	34
MEM	Learn the words of an idiom together	48	77
MEM	Use Physical action when learning a word	13	49
MEM	Use semantic feature grids	--	--
COG	Verbal repetition	76	84
COG	Written Repetition	76	91
COG	Word Lists	54	67
COG	Flash Cards	25	65
COG	Take notes in class	64	84
COG	Use the vocabulary section in your textbook	48	76
COG	Listen to tape of word lists	--	--
COG	Put English labels on physical objects	--	--
COG	Keep a vocabulary notebook	--	--

MET	Use English language media (songs, movies, newscasts, etc.)	--	--
MET	Testing oneself with word tests	--	--
MET	Use spaced word practice	--	--
MET	Skip or pass new word	41	16
MET	Continue to study word over time	45	87

-- = *Strategy was not included on the initial list used in the survey.*

Appendix III: The Learner Dictionary Template Page

Discovery Strategy 2: Social Strategy:		Consolidation Strategy 1: Social Strategy:	
Discovery Strategy 1: Determination Strategy:	Word: Sense:		Consolidation Strategy 2: Cognitive Strategy:
		Consolidation Strategy 3: Metacognitive Strategy:	

Appendix IV: Sample Online Word Template from Webspirationpro

The screenshot displays the Webspirationpro online word template interface. The main workspace contains a project plan for 'Ambitious'.

Project Plan:

- Central Node:** A large yellow trophy icon labeled 'Ambitious(adi)'.
- Top Section:**
 - A green oval labeled 'Create an ambitious project' is connected to a green oval labeled 'History of the project'.
 - A green oval labeled 'History of the project' is connected to a green oval labeled 'History of the project'.
 - A green oval labeled 'History of the project' is connected to a green oval labeled 'History of the project'.
- Right Section:**
 - A green oval labeled 'An ambitious plan will need a lot of work and will be difficult to achieve' is connected to a green oval labeled 'History of the project'.
 - A green oval labeled 'History of the project' is connected to a green oval labeled 'History of the project'.
 - A green oval labeled 'History of the project' is connected to a green oval labeled 'History of the project'.
- Bottom Section:**
 - A green oval labeled 'History of the project' is connected to a green oval labeled 'History of the project'.
 - A green oval labeled 'History of the project' is connected to a green oval labeled 'History of the project'.
 - A green oval labeled 'History of the project' is connected to a green oval labeled 'History of the project'.

Interface Elements:

- Top Bar:** Includes navigation links like 'Document', 'Edit', 'View', 'Symbol', 'Link', 'Effect', 'Tools', 'Sharing', and 'Help'.
- Left Sidebar:** Contains a 'History of the project' section with a list of items.
- Right Sidebar:** Contains a 'Comments' section with a list of comments.
- Bottom Bar:** Includes a 'Chat' section with a list of chat messages.

Appendix V: The Complete List of the Word Frequency Query for the Contributions from the Mapping of Lexical Semantic Relations

Word	Count	Weighted Percentage (%)
words	21	7.84
study	9	3.36
learned	8	2.99
vocabulary	8	2.99
contributed	7	2.61
technique	7	2.61
learn	4	1.49
word	4	1.49
yes	4	1.49
across	3	1.12
came	3	1.12
easily	3	1.12
learning	3	1.12
lot	3	1.12
mental	3	1.12
mind	3	1.12
really	3	1.12
studied	3	1.12
terms	3	1.12
although	2	0.75
better	2	0.75
dictionary	2	0.75
especially	2	0.75
exam	2	0.75
improved	2	0.75
keep	2	0.75
lexicon	2	0.75
new	2	0.75
now	2	0.75
opinion	2	0.75
questions	2	0.75
reading	2	0.75
started	2	0.75
used	2	0.75
using	2	0.75
without	2	0.75
writing	2	0.75
acquired	1	0.37
added	1	0.37
addition	1	0.37
aiming	1	0.37
also	1	0.37
answer	1	0.37

answering	1	0.37
antonym	1	0.37
antonyms	1	0.37
apparently	1	0.37
books	1	0.37
boring	1	0.37
case	1	0.37
cathcy	1	0.37
classroom	1	0.37
comfortable	1	0.37
comparison	1	0.37
competence	1	0.37
contribution	1	0.37
course	1	0.37
coursebook	1	0.37
deal	1	0.37
deserves	1	0.37
difficulties	1	0.37
done	1	0.37
doubt	1	0.37
either	1	0.37
english	1	0.37
enjoyable	1	0.37
even	1	0.37
everyday	1	0.37
exact	1	0.37
example	1	0.37
exams	1	0.37
expected	1	0.37
exposed	1	0.37
face2face	1	0.37
facets	1	0.37
far	1	0.37
feel	1	0.37
films	1	0.37
forgotten	1	0.37
fulfil	1	0.37
great	1	0.37
however	1	0.37
hyponym	1	0.37
inference	1	0.37
instance	1	0.37
keeping	1	0.37
know	1	0.37
knowledge	1	0.37
lasting	1	0.37
led	1	0.37
life	1	0.37

limited	1	0.37
list	1	0.37
long	1	0.37
made	1	0.37
main	1	0.37
make	1	0.37
makes	1	0.37
meaning	1	0.37
memorize	1	0.37
memorizing	1	0.37
moreover	1	0.37
need	1	0.37
never	1	0.37
noticed	1	0.37
numerous	1	0.37
one	1	0.37
overcame	1	0.37
paper	1	0.37
perform	1	0.37
phobia	1	0.37
realize	1	0.37
recognized	1	0.37
relations	1	0.37
relationship	1	0.37
relatively	1	0.37
repetition	1	0.37
semantic	1	0.37
senses	1	0.37
sentence	1	0.37
single	1	0.37
sometimes	1	0.37
struggling	1	0.37
studies	1	0.37
successful	1	0.37
synonym	1	0.37
synonyms	1	0.37
think	1	0.37
though	1	0.37
turned	1	0.37
understanding	1	0.37
use	1	0.37
watched	1	0.37
way	1	0.37
ways	1	0.37
well	1	0.37
worths	1	0.37

Appendix VI: Complete Responses to the Query for the Contributions from the Mapping of Lexical Semantic Relations

If our lexical semantic relations study was of any help for you, what were these contributions for you-- Sözcüklerin anlambilimsel ilişkilerini incelediğimiz bu çalışmanın size herhangi bir katkısı oluyorsa, bu katkılar nelerdir?

Responses:

- Although I couldn't fulfil the study in the way it deserves, I say that we have done it before when I came across to English either in exam or in my everyday life. Even the classroom repetition makes the knowledge to be acquired in my mind, though I couldn't keep up with the study.
- The study have contributed in numerous ways. I learned with which other words the words that I have learned are used in sentence. I could perform a better study in terms of its being catchy through learning the antonyms and the synonyms of the words.
- The semantic relations of the words we have studied are apparently learned and a lot of words are added to the mental lexicon while aiming to learn one. A really successful technique.
- I think the study contributed to me while learning a lot of words. For example, I was struggling while answering reading questions, However, I started to answer reading questions easily. I also started using any word with its synonym, hyponym, or antonym.
- I came across and recognized more and more words than before. Although I sometimes don't know the exact meaning of a word, I can make inference and use my mind. I have noticed that those words that we studied were not limited with the words in Face2face coursebook; that is to say, I came across with the words we studied in other books or in films that I watched. I feel that my mental dictionary has improved, and that is the case.
- Yes, it did. It made me learn vocabulary easily.
- It had contribution over me. We learned more and more other words while learning a single word.
- I can, without any doubt, say that this study technique had contributed to my vocabulary study more than I expected. For instance, I used to memorize the

new words by writing them on a paper, but we really learned the words (not only for the exam) through this technique.

- It really contributed to me, especially in terms of their senses and comparison. Moreover, it led us to keep the words in mental lexicon relatively easily.
- Yes, it contributed. Especially, in terms of keeping words in mind. We can now realize the words without using dictionary and we learned other new words in addition to the main words that we need to learn. It is by far better than having a vocabulary list and memorizing them. The words learned through this technique are long-lasting, and, in my opinion, they will never be forgotten.
- Yes, it has contributed to me. My vocabulary competence has improved through this technique. I was exposed to difficulties on vocabulary in the exams, but now I am comfortable with understanding the words.
- Through this study technique, I have learned the relationship of a word with other words and how to study vocabulary.
- Yes. In my opinion, it has contributed a great deal. I overcame my phobia to learn vocabulary but and vocabulary studies turned out to be enjoyable through this technique. Of course, it has
- boring facets as well such as writing a lot, but it worths.

Appendix VII: The Values of Pearson's Correlation Coefficient for the Contributions from the Mapping of Lexical Semantic Relations

Node A	Node B	Pearson correlation coefficient
Nodes\\Student 8	Nodes\\Student 12	0.638729
Nodes\\Student 8	Nodes\\Student 2	0.590305
Nodes\\Student 2	Nodes\\Student 12	0.557927
Nodes\\Student 5	Nodes\\Student 2	0.482967
Nodes\\Student 5	Nodes\\Student 1	0.466847
Nodes\\Student 8	Nodes\\Student 11	0.435429
Nodes\\Student 8	Nodes\\Student 5	0.426509
Nodes\\Student 5	Nodes\\Student 4	0.417929
Nodes\\Student 2	Nodes\\Student 10	0.404163
Nodes\\Student 4	Nodes\\Student 2	0.390826
Nodes\\Student 8	Nodes\\Student 1	0.375849
Nodes\\Student 12	Nodes\\Student 11	0.361263
Nodes\\Student 5	Nodes\\Student 11	0.359652
Nodes\\Student 8	Nodes\\Student 4	0.349144
Nodes\\Student 7	Nodes\\Student 10	0.348916
Nodes\\Student 3	Nodes\\Student 10	0.341078
Nodes\\Student 2	Nodes\\Student 1	0.334368
Nodes\\Student 4	Nodes\\Student 1	0.331346
Nodes\\Student 13	Nodes\\Student 11	0.324455
Nodes\\Student 12	Nodes\\Student 1	0.324347
Nodes\\Student 7	Nodes\\Student 2	0.3233
Nodes\\Student 8	Nodes\\Student 10	0.315617
Nodes\\Student 5	Nodes\\Student 12	0.310338
Nodes\\Student 7	Nodes\\Student 12	0.306313
Nodes\\Student 4	Nodes\\Student 12	0.30216
Nodes\\Student 12	Nodes\\Student 10	0.301017
Nodes\\Student 2	Nodes\\Student 11	0.298786
Nodes\\Student 6	Nodes\\Student 13	0.273044
Nodes\\Student 4	Nodes\\Student 11	0.250971
Nodes\\Student 11	Nodes\\Student 10	0.236404
Nodes\\Student 6	Nodes\\Student 11	0.226547
Nodes\\Student 8	Nodes\\Student 3	0.226449
Nodes\\Student 3	Nodes\\Student 2	0.220308
Nodes\\Student 3	Nodes\\Student 12	0.218827
Nodes\\Student 9	Nodes\\Student 3	0.211054
Nodes\\Student 9	Nodes\\Student 10	0.206526
Nodes\\Student 8	Nodes\\Student 13	0.20285
Nodes\\Student 7	Nodes\\Student 3	0.202594
Nodes\\Student 11	Nodes\\Student 1	0.192694
Nodes\\Student 5	Nodes\\Student 10	0.183563
Nodes\\Student 13	Nodes\\Student 12	0.169549
Nodes\\Student 5	Nodes\\Student 3	0.158607
Nodes\\Student 9	Nodes\\Student 6	0.154748

Nodes\\Student 6	Nodes\\Student 10	0.150185
Nodes\\Student 9	Nodes\\Student 7	0.132453
Nodes\\Student 8	Nodes\\Student 7	0.128391
Nodes\\Student 7	Nodes\\Student 5	0.123613
Nodes\\Student 9	Nodes\\Student 2	0.122873
Nodes\\Student 7	Nodes\\Student 6	0.113272
Nodes\\Student 7	Nodes\\Student 4	0.097615
Nodes\\Student 6	Nodes\\Student 12	0.079404
Nodes\\Student 9	Nodes\\Student 8	0.075101
Nodes\\Student 3	Nodes\\Student 11	0.060261
Nodes\\Student 4	Nodes\\Student 13	0.047813
Nodes\\Student 13	Nodes\\Student 10	0.039064
Nodes\\Student 6	Nodes\\Student 3	0.027523
Nodes\\Student 9	Nodes\\Student 5	0.020739
Nodes\\Student 9	Nodes\\Student 11	0.018315
Nodes\\Student 7	Nodes\\Student 11	0.018194
Nodes\\Student 2	Nodes\\Student 13	0.014246
Nodes\\Student 3	Nodes\\Student 13	0.010926
Nodes\\Student 5	Nodes\\Student 13	0.009885
Nodes\\Student 9	Nodes\\Student 12	0.003023
Nodes\\Student 8	Nodes\\Student 6	0.001067
Nodes\\Student 4	Nodes\\Student 10	0
Nodes\\Student 9	Nodes\\Student 4	0
Nodes\\Student 6	Nodes\\Student 4	-0.01313
Nodes\\Student 4	Nodes\\Student 3	-0.015292
Nodes\\Student 13	Nodes\\Student 1	-0.015809
Nodes\\Student 6	Nodes\\Student 2	-0.066943
Nodes\\Student 6	Nodes\\Student 5	-0.07601
Nodes\\Student 6	Nodes\\Student 1	-0.08071
Nodes\\Student 9	Nodes\\Student 1	-0.086454
Nodes\\Student 9	Nodes\\Student 13	-0.086856
Nodes\\Student 7	Nodes\\Student 1	-0.087503
Nodes\\Student 7	Nodes\\Student 13	-0.096805
Nodes\\Student 3	Nodes\\Student 1	-0.133163
Nodes\\Student 10	Nodes\\Student 1	-0.138363

Appendix VIII: The Complete List of the Word Frequency Query for the Acquisition of Vocabulary Best Through the Mapping of Lexical Semantic Relations

Word	Count	Weighted Percentage (%)
words	14	6.83
technique	9	4.39
relations	6	2.93
learn	5	2.44
much	5	2.44
semantic	5	2.44
vocabulary	5	2.44
antonyms	4	1.95
learned	4	1.95
learning	4	1.95
semester	4	1.95
word	4	1.95
given	3	1.46
synonyms	3	1.46
treatment	3	1.46
use	3	1.46
acquisition	2	0.98
believe	2	0.98
besides	2	0.98
better	2	0.98
dictionary	2	0.98
effective	2	0.98
first	2	0.98
important	2	0.98
second	2	0.98
studied	2	0.98
study	2	0.98
terms	2	0.98
using	2	0.98
visuals	2	0.98
way	2	0.98
without	2	0.98
acquired	1	0.49
actually	1	0.49
also	1	0.49
another	1	0.49
anywhere	1	0.49
behalf	1	0.49
best	1	0.49
brainstorming	1	0.49
built	1	0.49
certain	1	0.49

compare	1	0.49
cool	1	0.49
definitely	1	0.49
definitions	1	0.49
detailed	1	0.49
diagrams	1	0.49
else	1	0.49
especially	1	0.49
example	1	0.49
exposed	1	0.49
facilitated	1	0.49
forgot	1	0.49
furthermore	1	0.49
get	1	0.49
grasp	1	0.49
great	1	0.49
guessed	1	0.49
help	1	0.49
holonyms	1	0.49
hypernyms	1	0.49
hyperonyms	1	0.49
hyponyms	1	0.49
idea	1	0.49
improved	1	0.49
instead	1	0.49
just	1	0.49
lexicon	1	0.49
looked	1	0.49
many	1	0.49
means	1	0.49
memorized	1	0.49
mental	1	0.49
meronyms	1	0.49
metonyms	1	0.49
mind	1	0.49
never	1	0.49
planning	1	0.49
polysemes	1	0.49
pretty	1	0.49
process	1	0.49
provided	1	0.49
recognized	1	0.49
relationships	1	0.49
sentences	1	0.49
still	1	0.49
supplementary	1	0.49
synonyms	1	0.49
think	1	0.49

troponyms	1	0.49
two	1	0.49
via	1	0.49
videos	1	0.49
webspiration	1	0.49
well	1	0.49
yes	1	0.49

Appendix IX: Complete Responses to the Query for the Acquisition of Vocabulary Best Through the Mapping of Lexical Semantic Relations

Is there any acquisition which would only be obtained through lexical semantic relations-- Yalnızca bu uygulama kanalıyla elde edebileceğiniz bir kazanım oldu mu?

Responses:

- I didn't use to have much idea about synoymys and antonyms.
 - While learning a word, I also learned its hyponyms and hypernyms; meronyms and holonyms; synonyms and antonyms, and if it has any, polysems and metonyms.
 - I believe that we can learn the semantic relations of words best by this technique. Furthermore, the visuals given with the words, their dictionary definitions and supplementary means such as videos given in webspiration facilitated the learning process.
 - For me, it was a well-acquisition on behalf of learning the semantic relations of the words.
 - "Definitely. I was exposed to many example sentences via this technique and, by this way,it was a much more effective technique in terms of where and how to use words.Besides, I recognized that learning vocabulary is more important than I guessed.
 - I don't think that I can learn vocabulary as much and effective as we did by just using dictionary. This technique is pretty cool."
 - I say I don't believe that I could learn this much words without this technique.
 - I could learn vocabulary better only through this technique.
 - I acquired the semantic relationships between the words only through this treatment with its visuals.
 - It was a great acquisition that I wouldn't get from anywhere else especially in terms of how to compare two words, and which word to use instead of another word.
- Besides,
- the brainstorming and diagrams that we have built were as important.
- If I had studied vocabulary without any help, I would never have looked up their synonyms, antonyms or other semantic relations. I could grasp words better and more through this technique.

- Yes, it did. My mental lexicon could only be improved by such a way. This treatment of ours have studied in the second semester. I memorized the vocabulary in the first semester, but I forgot most of them. I am planning to study those words of the first semester using this technique. The words of the second semester are still in my mind. I can learn other words which are tied in semantic relations to a certain word.
- I couldn't have learned the relations between words as detailed as given in this technique if we hadn't been provided with this study. Actually, I couldn't have learned as much words as I did in this treatment.
- I learned the hyperonyms, troponyms, synonyms, antonyms and other relations of the words.

Appendix X: The Values of Pearson's Correlation Coefficient for the Acquisition of Vocabulary Best Through the Mapping of Lexical Semantic Relations

-

Node A	Node B	Pearson correlation coefficient
Nodes\\Student 6	Nodes\\Student 5	0.671278
Nodes\\Student 6	Nodes\\Student 12	0.633852
Nodes\\Student 6	Nodes\\Student 10	0.604773
Nodes\\Student 7	Nodes\\Student 5	0.568986
Nodes\\Student 7	Nodes\\Student 6	0.554209
Nodes\\Student 7	Nodes\\Student 10	0.513582
Nodes\\Student 13	Nodes\\Student 12	0.511625
Nodes\\Student 6	Nodes\\Student 11	0.483657
Nodes\\Student 12	Nodes\\Student 10	0.458763
Nodes\\Student 5	Nodes\\Student 12	0.452135
Nodes\\Student 13	Nodes\\Student 10	0.449803
Nodes\\Student 12	Nodes\\Student 11	0.444138
Nodes\\Student 5	Nodes\\Student 10	0.42955
Nodes\\Student 8	Nodes\\Student 12	0.395049
Nodes\\Student 11	Nodes\\Student 10	0.392892
Nodes\\Student 6	Nodes\\Student 1	0.386763
Nodes\\Student 8	Nodes\\Student 6	0.350629
Nodes\\Student 6	Nodes\\Student 3	0.347414
Nodes\\Student 8	Nodes\\Student 11	0.336275
Nodes\\Student 3	Nodes\\Student 12	0.335865
Nodes\\Student 5	Nodes\\Student 1	0.331462
Nodes\\Student 2	Nodes\\Student 13	0.32443
Nodes\\Student 5	Nodes\\Student 11	0.321964
Nodes\\Student 8	Nodes\\Student 10	0.321712
Nodes\\Student 6	Nodes\\Student 13	0.320955
Nodes\\Student 7	Nodes\\Student 11	0.315912
Nodes\\Student 7	Nodes\\Student 12	0.303266
Nodes\\Student 4	Nodes\\Student 3	0.2948
Nodes\\Student 8	Nodes\\Student 3	0.2948
Nodes\\Student 10	Nodes\\Student 1	0.269854
Nodes\\Student 12	Nodes\\Student 1	0.264396
Nodes\\Student 13	Nodes\\Student 11	0.249886
Nodes\\Student 13	Nodes\\Student 1	0.23592
Nodes\\Student 8	Nodes\\Student 4	0.231951
Nodes\\Student 4	Nodes\\Student 13	0.208033
Nodes\\Student 8	Nodes\\Student 13	0.208033
Nodes\\Student 3	Nodes\\Student 10	0.192757
Nodes\\Student 7	Nodes\\Student 3	0.189517
Nodes\\Student 8	Nodes\\Student 5	0.183844
Nodes\\Student 3	Nodes\\Student 13	0.179495
Nodes\\Student 2	Nodes\\Student 12	0.179338
Nodes\\Student 3	Nodes\\Student 11	0.175007
Nodes\\Student 2	Nodes\\Student 10	0.173595

Nodes\\Student 5	Nodes\\Student 13	0.155016
Nodes\\Student 2	Nodes\\Student 1	0.152753
Nodes\\Student 4	Nodes\\Student 12	0.152191
Nodes\\Student 4	Nodes\\Student 10	0.149674
Nodes\\Student 5	Nodes\\Student 3	0.148856
Nodes\\Student 6	Nodes\\Student 2	0.144454
Nodes\\Student 7	Nodes\\Student 1	0.135242
Nodes\\Student 4	Nodes\\Student 11	0.128698
Nodes\\Student 9	Nodes\\Student 6	0.122507
Nodes\\Student 8	Nodes\\Student 7	0.11689
Nodes\\Student 11	Nodes\\Student 1	0.102586
Nodes\\Student 7	Nodes\\Student 13	0.101477
Nodes\\Student 8	Nodes\\Student 1	0.095719
Nodes\\Student 9	Nodes\\Student 12	0.069837
Nodes\\Student 9	Nodes\\Student 1	0.065414
Nodes\\Student 9	Nodes\\Student 5	0.064051
Nodes\\Student 5	Nodes\\Student 2	0.052906
Nodes\\Student 7	Nodes\\Student 2	0.047752
Nodes\\Student 9	Nodes\\Student 4	0.041188
Nodes\\Student 9	Nodes\\Student 8	0.041188
Nodes\\Student 6	Nodes\\Student 4	0.038496
Nodes\\Student 9	Nodes\\Student 11	0.032669
Nodes\\Student 9	Nodes\\Student 13	0.02021
Nodes\\Student 2	Nodes\\Student 11	0.012599
Nodes\\Student 4	Nodes\\Student 2	0.010489
Nodes\\Student 8	Nodes\\Student 2	0.010489
Nodes\\Student 9	Nodes\\Student 2	0.00951
Nodes\\Student 9	Nodes\\Student 10	0.002006
Nodes\\Student 9	Nodes\\Student 7	-0.010482
Nodes\\Student 5	Nodes\\Student 4	-0.027471
Nodes\\Student 3	Nodes\\Student 1	-0.029292
Nodes\\Student 3	Nodes\\Student 2	-0.055592
Nodes\\Student 7	Nodes\\Student 4	-0.062941
Nodes\\Student 4	Nodes\\Student 1	-0.069314
Nodes\\Student 9	Nodes\\Student 3	-0.091382

Appendix XI: The Complete List of the Word Frequency Query for the Overall Evaluation Related to the Mapping of Lexical Semantic Relations

Word	Count	Weighted Percentage (%)
treatment	16	4.91
technique	10	3.07
lot	9	2.76
words	8	2.45
really	5	1.53
study	5	1.53
thank	5	1.53
effort	3	0.92
great	3	0.92
learn	3	0.92
like	3	0.92
sometimes	3	0.92
successful	3	0.92
take	3	0.92
teacher	3	0.92
vocabulary	3	0.92
way	3	0.92
also	2	0.61
altay	2	0.61
bored	2	0.61
carried	2	0.61
class	2	0.61
cool	2	0.61
definitely	2	0.61
even	2	0.61
everyone	2	0.61
feel	2	0.61
grateful	2	0.61
helpful	2	0.61
instructor	2	0.61
just	2	0.61
learning	2	0.61
makes	2	0.61
mehmet	2	0.61
memorization	2	0.61
mental	2	0.61
moments	2	0.61
now	2	0.61
prep	2	0.61
process	2	0.61
put	2	0.61
remember	2	0.61
still	2	0.61

time	2	0.61
understand	2	0.61
word	2	0.61
able	1	0.31
accomplished	1	0.31
advantageous	1	0.31
almost	1	0.31
alternative	1	0.31
although	1	0.31
analysing	1	0.31
applied	1	0.31
architect	1	0.31
asleep	1	0.31
aspects	1	0.31
bad	1	0.31
believe	1	0.31
beneficial	1	0.31
brain	1	0.31
called	1	0.31
capacity	1	0.31
carry	1	0.31
carrying	1	0.31
certainly	1	0.31
clear	1	0.31
coming	1	0.31
consciously	1	0.31
contented	1	0.31
context	1	0.31
continues	1	0.31
contributed	1	0.31
contribution	1	0.31
contributions	1	0.31
covered	1	0.31
crystal	1	0.31
curriculum	1	0.31
department	1	0.31
dictionary	1	0.31
different	1	0.31
difficult	1	0.31
documents	1	0.31
done	1	0.31
ease	1	0.31
education	1	0.31
effective	1	0.31
enjoyed	1	0.31
exam	1	0.31
fact	1	0.31
fed	1	0.31

final	1	0.31
foreign	1	0.31
forget	1	0.31
fruitful	1	0.31
generally	1	0.31
get	1	0.31
going	1	0.31
good	1	0.31
got	1	0.31
guidance	1	0.31
half	1	0.31
handled	1	0.31
hard	1	0.31
hope	1	0.31
hours	1	0.31
however	1	0.31
ideal	1	0.31
important	1	0.31
improved	1	0.31
increase	1	0.31
integrate	1	0.31
keep	1	0.31
knowledge	1	0.31
language	1	0.31
later	1	0.31
learners'	1	0.31
lesson	1	0.31
lexicon	1	0.31
long	1	0.31
maintain	1	0.31
managed	1	0.31
many	1	0.31
mapping	1	0.31
may	1	0.31
might	1	0.31
mind	1	0.31
multifaceted	1	0.31
natural	1	0.31
needed	1	0.31
nervous	1	0.31
numbers	1	0.31
one	1	0.31
opinion	1	0.31
participants	1	0.31
pass	1	0.31
perfect	1	0.31
period	1	0.31
person	1	0.31

personal	1	0.31
perspectives	1	0.31
place	1	0.31
play	1	0.31
problems	1	0.31
provided	1	0.31
provokes	1	0.31
quite	1	0.31
realize	1	0.31
realized	1	0.31
relations	1	0.31
requires	1	0.31
result	1	0.31
scaffold	1	0.31
sciences	1	0.31
see	1	0.31
seen	1	0.31
semantic	1	0.31
sharing	1	0.31
shown	1	0.31
simpler	1	0.31
since	1	0.31
single	1	0.31
sleepless	1	0.31
sound	1	0.31
speaking	1	0.31
spend	1	0.31
spending	1	0.31
student	1	0.31
students	1	0.31
styles	1	0.31
subconsciously	1	0.31
success	1	0.31
successfully	1	0.31
suitable	1	0.31
suppelemented	1	0.31
sure	1	0.31
taking	1	0.31
term	1	0.31
thanks	1	0.31
think	1	0.31
though	1	0.31
times	1	0.31
tired	1	0.31
together	1	0.31
undoubtedly	1	0.31
unless	1	0.31
via	1	0.31

videos	1	0.31
view	1	0.31
visuals	1	0.31
vocabulay	1	0.31
ways	1	0.31
well	1	0.31
wholly	1	0.31
wish	1	0.31
without	1	0.31

Appendix XII: Complete Responses to the Query for the Overall Evaluation Related to the Mapping of Lexical Semantic Relations

*How is your overall evaluation for the mapping of lexical semantic relations practice?
Sözcüklerin anlambilimsel ilişkilerini incelediğimiz bu çalışmaya yönelik genel tutumunuz nasıldır?*

Responses:

- Although this vocabulary study technique is time-taking and requires effort, it is the most suitable technique to learn vocabulary wholly.
- That was a treatment that I haven't seen before; however, I certainly think that it had a great contribution to my mental dictionary. I realized as a student of natural sciences that I can play with the words just like I do with the numbers. That was a cool treatment which has shown that learning can take place through alternative ways other than memorization. Many thanks to our instructor Mehmet Altay for sharing this technique with us.
- Although this vocabulary study technique is time-taking and requires effort, it is the most suitable technique to learn vocabulary wholly.
- That is an ideal technique to realize the semantic relations of the words. That is crystal clear that if applied in foreign language education context more, this technique would be more than helpful. We are really grateful for our instructor Mehmet Altay, the architect of this treatment.
- For me, it was a great period of treatment. I definitely had times in which I got bored, but I also had moments in which I enjoyed a lot. It was a very effective treatment, and my mental lexicon has improved. I even had moments in which I carried out this treatment half asleep, but I could still keep the words in my mind as one can learn words consciously or subconsciously through this technique. I believe that I accomplished what can be called difficult via this technique.
- It was an advantageous treatment process as we handled each word with its all aspects.
- I was sometimes quite bored with mapping and some simpler words might have been without that, but still I am sure I will see their contributions later. Thank you a lot for your guidance.
- Teacher, thank you a lot. You had a great effort on us and this treatment was undoubtedly perfect for us.

- This treatment is definitely good for prep students. Because, they don't forget the words in this way.
- Generally speaking, the treatment process covered almost all learners' learning styles as it was multifaceted. It was like a scaffold in which the words were supplemented sometimes by videos, by visuals or documents. By this way, each of the participants was able to get what we needed. I can say that well done we have carried out this treatment all the way even though we were tired, sometimes fed up, or sleepless. Unless we did this study, I would feel nervous now as the final exam to pass the prep class is coming up, but now I am at ease. And I thank you a lot for this treatment.
- This treatment was really important for us to take the vocabulary in so that we can remember it in long term. Analysing the words with different perspectives makes our brain increase its capacity to understand.
- You are really successful with your technique that you can integrate everyone in the class to the lesson. You managed to maintain this treatment successfully. Both carrying on the department curriculum this treatment together is not what everyone can do. We are grateful that you have put such an effort on us. Wish you carry on your success.
- I feel that this study was really helpful since it contributed to me a lot. We learn the vocabulary as we understand them. We were going to be contented with memorization if we were not provided this technique. Teacher, thank you a lot. You are a very successful person and I hope it continues.
- My personal view is that it was a cool and beneficial treatment.
- In my opinion, it is a really successful technique as we spend a lot of time. In fact, we also take the knowledge in as a result of this. I remember spending hours for just a single word, and it may sound bad, but what makes this study fruitful is that it provokes hard study. I thank a lot to my teacher as he had to put up with a lot of problems for us and himself.

Appendix XIII: The Values of Pearson's Correlation Coefficient for the Overall Evaluation Related to the Mapping of Lexical Semantic Relations

Node A	Node B	Pearson correlation coefficient
Nodes\\Student 4	Nodes\\Student 1	0.593738
Nodes\\Student 5	Nodes\\Student 4	0.506543
Nodes\\Student 8	Nodes\\Student 4	0.430496
Nodes\\Student 13	Nodes\\Student 11	0.37426
Nodes\\Student 8	Nodes\\Student 5	0.346786
Nodes\\Student 5	Nodes\\Student 1	0.330325
Nodes\\Student 8	Nodes\\Student 1	0.312301
Nodes\\Student 4	Nodes\\Student 11	0.3041
Nodes\\Student 11	Nodes\\Student 1	0.218076
Nodes\\Student 8	Nodes\\Student 7	0.21637
Nodes\\Student 2	Nodes\\Student 11	0.213679
Nodes\\Student 6	Nodes\\Student 11	0.212544
Nodes\\Student 4	Nodes\\Student 13	0.211674
Nodes\\Student 5	Nodes\\Student 11	0.210823
Nodes\\Student 6	Nodes\\Student 13	0.195318
Nodes\\Student 5	Nodes\\Student 13	0.177639
Nodes\\Student 8	Nodes\\Student 11	0.174566
Nodes\\Student 6	Nodes\\Student 10	0.151805
Nodes\\Student 3	Nodes\\Student 10	0.150889
Nodes\\Student 3	Nodes\\Student 2	0.137315
Nodes\\Student 7	Nodes\\Student 4	0.133858
Nodes\\Student 6	Nodes\\Student 5	0.131903
Nodes\\Student 6	Nodes\\Student 12	0.130602
Nodes\\Student 7	Nodes\\Student 12	0.130602
Nodes\\Student 12	Nodes\\Student 10	0.130557
Nodes\\Student 8	Nodes\\Student 6	0.126008
Nodes\\Student 12	Nodes\\Student 1	0.125262
Nodes\\Student 13	Nodes\\Student 1	0.121264
Nodes\\Student 9	Nodes\\Student 7	0.120498
Nodes\\Student 3	Nodes\\Student 1	0.108729
Nodes\\Student 6	Nodes\\Student 4	0.100972
Nodes\\Student 2	Nodes\\Student 13	0.09903
Nodes\\Student 8	Nodes\\Student 12	0.091756
Nodes\\Student 7	Nodes\\Student 6	0.088351
Nodes\\Student 7	Nodes\\Student 3	0.086688
Nodes\\Student 7	Nodes\\Student 10	0.078659
Nodes\\Student 2	Nodes\\Student 10	0.075525
Nodes\\Student 4	Nodes\\Student 12	0.074046
Nodes\\Student 8	Nodes\\Student 13	0.0728
Nodes\\Student 4	Nodes\\Student 3	0.072473
Nodes\\Student 6	Nodes\\Student 1	0.070756
Nodes\\Student 7	Nodes\\Student 1	0.070756
Nodes\\Student 9	Nodes\\Student 12	0.065805

Nodes\\Student 7	Nodes\\Student 5	0.064426
Nodes\\Student 9	Nodes\\Student 3	0.061195
Nodes\\Student 9	Nodes\\Student 10	0.053211
Nodes\\Student 3	Nodes\\Student 11	0.052344
Nodes\\Student 4	Nodes\\Student 10	0.045294
Nodes\\Student 3	Nodes\\Student 12	0.043619
Nodes\\Student 6	Nodes\\Student 2	0.042869
Nodes\\Student 4	Nodes\\Student 2	0.042274
Nodes\\Student 9	Nodes\\Student 13	0.032793
Nodes\\Student 5	Nodes\\Student 12	0.029365
Nodes\\Student 9	Nodes\\Student 6	0.028975
Nodes\\Student 9	Nodes\\Student 1	0.023204
Nodes\\Student 9	Nodes\\Student 4	0.020788
Nodes\\Student 8	Nodes\\Student 10	0.016322
Nodes\\Student 10	Nodes\\Student 1	0.013665
Nodes\\Student 6	Nodes\\Student 3	0.008981
Nodes\\Student 11	Nodes\\Student 10	0.004406
Nodes\\Student 9	Nodes\\Student 11	-0.006767
Nodes\\Student 13	Nodes\\Student 10	-0.008632
Nodes\\Student 9	Nodes\\Student 5	-0.010485
Nodes\\Student 2	Nodes\\Student 1	-0.018659
Nodes\\Student 9	Nodes\\Student 8	-0.022178
Nodes\\Student 5	Nodes\\Student 3	-0.035204
Nodes\\Student 3	Nodes\\Student 13	-0.036179
Nodes\\Student 2	Nodes\\Student 12	-0.036813
Nodes\\Student 5	Nodes\\Student 10	-0.038089
Nodes\\Student 7	Nodes\\Student 2	-0.04693
Nodes\\Student 12	Nodes\\Student 11	-0.055949
Nodes\\Student 8	Nodes\\Student 3	-0.056084
Nodes\\Student 13	Nodes\\Student 12	-0.06488
Nodes\\Student 9	Nodes\\Student 2	-0.070082
Nodes\\Student 7	Nodes\\Student 11	-0.071324
Nodes\\Student 5	Nodes\\Student 2	-0.079024
Nodes\\Student 8	Nodes\\Student 2	-0.080778
Nodes\\Student 7	Nodes\\Student 13	-0.08271

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March 2015

A. EDUCATION

- | | |
|----------------|--|
| 2010 - Present | Çukurova University, Ph.D.
Major: English language Teaching
Advisor: Jülide İnözü, Ph.D. |
| 2007 - 2010 | University of Gaziantep, M.A.
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Advisor: Filiz Yalçın Tılfarlıoğlu, Ph.D. |
| 2001 - 2006 | Dokuz Eylül University, B.A.
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- | | |
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| 2006 - Present | English Language Instructor , School of Foreign Languages,
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- | | |
|------|--|
| 2006 | B.A. Graduation as the Top 2nd of the Department
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D. PROFESSIONAL AFFILIATIONS AND SERVICES

- | | |
|-----------------|--|
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April, | Organizing CommitteeMember
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|-----------------|--|

E. PUBLICATIONS

PEER-REVIEWED JOURNAL ARTICLES

Altay, M., & Tılfarlıoğlu, F. Y. (2012). Building up a Learner Corpus Through Creative Nonfiction Prose: an Experimental Research. *ESOSDER*, 11(39), 22-35.

Altay, M. (2015). Mehmet: a Survey on the Linguistic Symptoms of F90.0 Disturbance of Activity and Attention in Childhood. *COLEJ*.

BOOKS

Kutlar, L., Evişen, N., Altay, M., Muşlu, M., & Torun, Y. (2013). *The Writing Journey*. (B. Bağçeci, Ed.) Bursa: Ekin.

F. OTHER ACADEMIC PARTICIPATIONS

- | | |
|-----------|--|
| June 2013 | The College of North West London, In-Service Training, London |
| 2013 | The Workshops of Material Development in Education, TÜBİTAK, Ankara |
| July 2012 | Summer ELT Institute on 'Writing for Publication', US Embassy, Yaşar University, İzmir |
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H. BIODATA _____

Mehmet Altay was born in Mut, Mersin. He took his BA degree from Dokuz Eylül University in English Language Teaching in 2006. He started teaching English as a foreign language at the School of Foreign Languages in the University of Gaziantep in the same year. He took his MA degree in English Language Teaching and started his PhD education in 2010. He is currently studying on his dissertation. His research interests are semantics, technology in language education, short stories, and second language learning theories. His personal interests are astronomy, neuroscience, classical English literature, classical Turkish literature, and musical instruments.