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A Study of Verbal Reasoning and EFL (English as a Foreign Language) Vocabulary Learning from a Psycholinguistic Perspective

A Case Study of Third Year LMD Learners/ University of Constantine1

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“not only every language but every lexeme of a language is an entire world in itself” (Mel’Čuk, 1981, p. 570).

Dedication

To my family and friends..

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- I want to thank a number of people who helped me throughout the writing of this thesis:

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Abstract

The present study examines the role of EFL (English as a Foreign Language) inference of technical words in promoting academic receptive vocabulary size. Moreover, it is interested in the linguistic processes involved in inferring terminology. To this end, an experiment was conducted, during the academic year 2013-2014, where two groups of third year female students are used: the first group serves as the control group while the second represents the experimental group. Both groups are tested for the vocabulary size (the dependent variable) using the 14 000 version of the Vocabulary Size Test (VST)/ 2013-2014. Moreover, the participants' lexical inference capacity (the independent variable) is rated from Cloze Procedure Format (CPF) activities that are administered almost weekly, during the year, by the end of the lectures in Psychology of Education. In every class, the students were assigned a text in the latter field and have to fill in the blanks using provided technical terms, learnt in the same lecture. The data were analyzed, after that, using the t-test. The results showed that EFL written receptive vocabulary size scores did not correspond to the scores obtained from the CPF tasks, while lexical inference has proved to be connected to technical vocabulary learning; semantic knowledge and background knowledge are the mostly used knowledge sources to guess the missing items in the texts. In addition, the students' vocabulary size proves not to be enough to carry out adequate comprehension. Hence, further scrutiny on the knowledge sources involved in successful inference is required. Moreover, teaching vocabulary should be reinforced in classrooms by encouraging extensive reading and inference, and using dictionaries and applications (technology) that might even be used outside the classroom, for better vocabulary growth.

Key words: - English Vocabulary Lerning - Mental Lexicon - Lexical inference

List of Abbreviations

CA: Componential Analysis

CNCDE: Cambridge and Nottingham Corpus of Discourse in English

CPF: Cloze Procedure Format

ESL: English as a Second Language

Ln: All the Other Languages (apart from L1 and L2)

L1: First Language

L2: Second Language

LMD: Licence, Master, Doctorate

LTM: Long-term Memory

P: Productive

R: Receptive

SL: Second Language

SLA: Second Language Acquisition

ST: Short-term

STM: Short-term Memory

A: the Mean of the pilot pre-test grades

$\overline{\mathbf{B}}$**:** Mean of the pilot post-test grades

$\overline{\mathbf{X1}}$**:** Mean of the experimental pre-test grades

$\overline{\mathbf{X2}}$**:** Mean of the control post-test grades

$\overline{\mathbf{Y1}}$**:** Mean of the experimental pre-test grades

$\overline{\mathbf{Y2}}$**:** Mean of the control post-test grades

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General Introduction

1. Scope of the Research

The vast majority of Literature on vocabulary acknowledged the role of this latter in learning a second/ foreign language. Lewis (1993) believes the lexis is the core of language, and Zimmerman (1997) thinks that words are crucial to language acquisition and use. Moreover, vocabulary research pointed out the importance of 'specialized technical vocabulary' (Chung & Nation, 2004; Fan, 1998; Fraser, 2005; Liu & Nesi, 1999). An appropriate use of specialized vocabulary, which is subject-related, is an indicator of the depth of subject knowledge (Mohan & Van Naerssen, 1997). Studying specialized words, therefore, provides with knowledge about learners' lexical and general language learning (besides competence in the field). Yet, vocabulary knowledge is one of the most challenging factors for foreign language learners during the process of second language learning, as it is deeper and more complex than just the memorization of word's meaning. Most of second language vocabulary researchers agree that lexical knowledge is incremental, i.e. it includes various dimensions of knowledge. Schmitt (2000), for example, states that learners tend to learn more about some word knowledge features than others. They will learn about a word's basic sense before gaining more word's meanings and having a collocational competence. As for Waring (1998), he proposes that employing a word productively precedes total mastery of its receptive features. I.e, the two dimensions overlap (Schmitt, 2000). Other dimensions involve, for example, "vocabulary depth"or the learner's level knowledge of different aspects of a given word (how well a student know this word), "vocabulary breadth" or size (number of words the meaning of which the learner has at least some superficial knowledge).

So, learners should be concerned about dealing with the load of words and the different dimensions in vocabulary learning, and educators are required to use an effective method in enhancing it. This requires a deeper knowledge about how people learn words, and how these latter are present in the mind.

Nowadays, the major idea in relation to the organization of lexicon is that words are stored in a well arranged interrelated network. However, the mental lexicon is a complex phenomenon, this is the reason why the exact nature of lexical knowledge has always perplexed researchers and teachers. This is not surprising as a lexicon can hold several thousands of words connected differently to other words in the lexical network. In addition, those connections between words are not easy to explain. For instance, red may be linked to words like spicy, blood, etc; but illustrating the way these words are retained in the mental lexicon or the way they are connected to each other is not simple. Nippold (2004), a researcher interested in the domain of first language (L1) development during childhood and adolescence defines the literate lexicon as a *"mental dictionary of thousands of complex and low-frequency words, co-existing in an elaborate semantic network" (p. 2).* These words are related to reading comprehension (and writing), and understanding the field of specific concepts.

With this understanding, the following case study was undertaken on general written receptive vocabulary size in relation to terminology inference (one aspect of inference used to guess the meaning of unfamiliar words).

2. Statement of the Problem

Despite the fact that there appears to be an increasing agreement (among researchers) that vocabulary is a critical element in language learning, it is, yet, a field that is usually more or less uncared for. Moreover, there is no consensus on how vocabulary should be taught. Zimmerman (1997) points out the persistence of the underestimation of second language vocabulary learning importance. Paribakht and Wech (1997) claim that there is, still, much of research to be carried out in the field, on the way learners acquire vocabulary and, hence, on the best strategies about how vocabulary should be taught, while Sokmen (1997) claims the importance of word-meaning inferring from context as a principal vocabulary ability.

Lately, while learning decontextualized vocabulary is progressively losing support, learning vocabulary in context is drawing significant interest (Milton, 2009). It is an approach that considers the morphological, syntactic, and discourse information in texts (Nation & Coady, 1988). This approach is named lexical inference which is a cognitive process that uses known aspects and contexts to identify what is unknown in written materials (Paribakht & Wesche, 1999). It helps in instant understanding or might cause retention of the word.

Based on previous considerations, the present study tries to investigate the following questions:

- How large is the subjects' EFL vocabulary size?, and,

-What are the linguistic sources that the students mainly use in the inference of technical words?

- What is the relationship between technical terms' lexical inference, as reasoning capacity, and the general (non- technical) receptive vocabulary size?; more precisely, is the inference (informed guess) of technical terms (in the field of Psychology of Education) a separate cognitive skill or does it improve the learning of new EFL academic receptive vocabulary facet?

3. Aims of the Study

The present study aims to find out the degree of association between general written receptive vocabulary size and technical terms' lexical inference as a cognitive capacity. Another aim of the study involves awakening a sound curiosity about cognitive abilities related to EFL (English as a foreign language) vocabulary learning, to further our knowledge about technical words inferring procedures that EFL students use in reading comprehension. Also, the study sustains the call for teaching lexical items in a separate learning module.

4. Hypothesis

It is hypothesised that if EFL third year students at the university of Frère Mentouri/ Constantine1 would, successfully, use their cognitive capacities of inferring technical terms, then they would enhance their EFL academic (non-technical) written receptive vocabulary size.

5. Population

The sample of this study involves forty (40) female students of English as a foreign language, taken randomly from the entire population of two hundred seventy (270) of third-years, at the University of Frère Mentouri/ Constantine1.

6. Tools of Research

We have opted for a Pre-test Post-test control group design. It includes two parallel groups of students, where the first group serves as the control group while the other one (the experimental group) receives the treatment.The pre-test is administered to learn about the participants' general receptive vocabulary size. The post-test aims to find out the extent to which the manipulated independent variable (lexical inference) has an influence on the students' vocabulary knowledge. The t-test was used later, by means of the students' scores, to see whether there is a significant difference in achievement between the two groups.

As for the treatment, third year experimental participants were assigned cloze procedure activities, where every activity is administered right after the corresponding lesson (by the end of the lecture), during the academic year 2014. The students have to infer the missing items in the texts (seven texts) from among a list of items (technical terms) taught in the same lecture, in thirty minutes (30 minutes) for each. The chosen texts are related to the lectures that mainly use specialised terms. The tasks take part in about eleven (11) class periods in the field of Psychology of Education.

In addition, a pilot study was carried out for the dependent variable to adjust some points in the main study, like length of time and test validity.

7. Structure of the Thesis

The present thesis is made up of six chapters: the first three chapters comprise the literature survey and the last three ones the practical part. Chapter I "*Vocabulary Knowledge and Academic Vocabulary"*of this work explores, in the first section, second language vocabulary knowledge involving a discussion about what represents a word, aspects of knowing a word, and considering the historical background in second language (L2) vocabulary instruction. The second section tackles the types of L2 lexical knowledge with some emphasis on specialised items.

Chapter II "*Second Language Vocabulary Acquisition"* explores the process of second language acquisition/ learning from a psycholinguistic perspective, with particular focus on L2 vocabulary learning. The chapter involves the different hypotheses discussing the role of the first language (L1) in SLA (Second Language Acquisition). It also discusses the relationship between words in the mind, mainly in the bilingual mental lexicon; besides the role of memory mechanisms in L2 vocabulary acquisition. The chapter, by the end, tackles the arrangement of L2 vocabulary in the mind, and quickly sheds some light on some approaches to teaching vocabulary.

Chapter III "*Lexical Inference as a Verbal Reasoning Capacity in Second*

Language Reading" focuses on L2 vocabulary in texts (written discourse) and one way ESL (English as a second Language) learners tackle unknown words while reading English texts: lexical inference. Hence, the chapter defines lexical inference as a cognitive capacity and a vocabulary learning strategy required for reading comprehension. It describes the factors that influence this skill, and explains the processes and range of knowledge sources involved. In addition, the chapter discusses how lexical inference ability improves in first language, besides L2 inferring word meaning from context.

Chapter IV *"Methodology"* describes the methodology followed in the current research. The method used is an experiment/ before-after research design, by means of which there is an experimental and a control group both pretested on the dependent variable using the VST test (Vocabulary Size Test), followed by a post-test after the experimental group is assigned a treatment (Cloze Procedure Format tasks).

Chapter V *"Analysis of Treatment: CPF Lexical Inference Activities on Psychology of Education"* is devoted to the analysis of the treatment which involves CPF activities, administered to the experimental group, where the students are required to find out the deleted specialized words from among the words provided.

The last chapter, chapter VI *"Analysis of Pilot Study and Experiment (the VST Pre and Post-tests' Results of the Control and Experimental Groups)"*, is set for results' interpretations, besides some implications of the research. Data collected about the scores of the pre and post-test for both the experimental and control group are analysed, the pre-test is compared to the post-test for both groups, also pre-tests results, of the two groups, are compared and post-tests results too. Eventually, the students' scores obtained from the post-tests are used to make inferential statistics through a t-test to see whether there is a remarkable difference in achievement between the two groups.

Chapter I

Vocabulary Knowledge and Academic Vocabulary

Introduction

Vocabulary represents one of the most important skills necessary for learning and teaching a foreign language, and words are the main required tool for learners to develop the skills of listening, speaking, and reading, writing, and hence to use English effectively. Wilkins (1972) considers that nothing can be communicated without vocabulary while few can be communicated without grammar. Gupta and MacWhinney (1997; cited in Subekti & Lawson, 2007) also state that learning unfamiliar words is one of the most crucial processes in human development.

Chapter I of this work explores second language vocabulary knowledge involving aspects of knowing a word and considering the historical background in L2 vocabulary instruction. Besides that, the chapter tackles the types of L2 lexical knowledge with some emphasis on specialised items.

1.1. Vocabulary Knowledge

1.1.1. The Goals of Vocabulary Learning in another Language

1.1.1.1. How Much Vocabulary do Learners Need to Know in a Second Language?

There are three types of information to aid determine how much vocabulary is required to learn: the number of items in the language, the number of items learned by native speakers, the number of items required to use the language (Nation, 2001).

1.1.1.2. How Many Words are there in the Language (Size of the English Vocabulary)?

The number of words in the language is a hard question to answer because it is influenced by so many other questions: what do we consider as a word? Does ‘book’ and ‘books’ represent one word? Do we consider people’s names?, etc. (Nation, 2001). Accounts of the size of the English language vocabulary in the popular press have a huge scope: from 400 000 to 600 000 words (Clairborne, 1983), from a half million [in the Oxford English Dictionary] to larger than 2 millions (Crystal, 1988), about 1 million

(Nurnberg & Rosenblum, 1977), and 200 000 words in common use, but including technical and scientific terms would extend the overall into the millions (Schmitt, 2000). *Webster's Third International Dictionary* includes 476 000 words. The other languages do not approach the English vocabulary size; German involves 200 000 words, the biggest French dictionary involves around 150 000 words, and a Russian dictionary may involve 130 000 (Denning, Kesseler, & Leben, 2007). The difference in size of the English vocabulary is caused by contrasting definitions of a word, and therefore a research tried to make a more reliable evaluation by using word families, as an alternative of words, as the unit of calculating (Nation, 2001). Goulden, Nation, and Read (1990) calculated the number of word families in *Webster's third New International Dictionary* (1963), as the best accessible resource, and so evaluation of the vocabulary size in a language have commonly been founded on them. Goulden et al. (1990) end up, after eliminating items like proper names and alternative spellings, that the dictionary includes about 114 000 word families (this exceeds the aims of the majority of first and second language learners); a *word family*is a word and all its inflected and regular derived forms. Whatever group of numbers we take, it sounds that natives know tens of thousands of words (McCarthy, Okeeffe, & Walsh, 2010).

The large size of the English vocabulary has its own inconvenient, as we are called every now and then to use a dictionary to search for an unfamiliar word (Denning et al., 2007). Moreover, our everyday use of vocabulary does not involve several of the words we know; using the corpus which is a database of texts (written or spoken) saved on computer, permit us to know which ones we are expected to confront daily. Leech,Rayson, and Wilson (2001), for example, convey that, in the 100 000 000 word *British National Corpus* (BNC), more than 500 000 word forms just appear three times or less, and just 24 000 word forms happen ten times or more.

On the other hand, there are many approaches to determine what words will be counted; *Tokens:* a unit of counting words where every word form (written or spoken) is counted. This approach answers the question ‘how long is this book?’,*Types:* where the same word appearing twice is counted once. This approach serves to answer questions like ‘how many words does this dictionary hold?’,*Lemmas:* a Lemma involves a *headword* and several of its inflected and diminished (n’t) forms. The English inflections includes: plural, third person singular, present and past tense, past participle, -ing, comparative, superlative and possessive (Nation, 2001).

1.1.1.3. How Many Words do Native Speakers Know?

One of the approaches to establish vocabulary learning aims is to consider the language knowledge of native speakers. Knowledge of the whole lexicon of English (and most likely other languages) is away from second language learners and native speakers. Yet, the total vocabulary the average native speaker acquires is huge. Researchers have found that English native speaking university graduates will have a vocabulary range of about 20 000 word families (Nation, 2001). Moreover, current reliable research (Goulden, Nation & Read, 1990; Chronics, Cull, D’Anna, Healy, & Zechmeister, 1995; as cited in Schmitt, 2000) propose that scholarly native speakers of English know about 20 000 word families disregarding proper names. Generally, a set of 16 000 to 20 000 appears to be a reasonable assessment of the vocabulary size of intellectual native speakers of English. The latter are estimated to add a mean of 1000 word families to their vocabulary per year. These aims are controllable for non-native speakers of English though they are far from what the majority of learners of English as another language are pragmatically able to accomplish. Nation and Waring (1997) reached the same conclusion. They, hence, conclude that a five year starting school has a vocabulary size of about

4000 to 5000 word families:

> *the best conservative rule of thumb is that we have up to a vocabulary size of around 20,000 word families, we should expect that [English] native speakers will add roughly 1,000 word families a year to their vocabulary size. This means that a five year old beginning school will have a vocabulary of around 4,000 to 5,000 word families (p. 7).*

These data show that developing a native vocabulary size can be possible for second language learners (Schmitt, 2000). However, it is possibly not a usual product of second language learning. We don't know much, from researches on second-language learning, about how fast vocabulary is acquired (Wagner, Muse, & Tannenbaum, 2007). L2 vocabulary learning can improve faster than L1 vocabulary learning usually does; if not L2 learners would never reach the totality or close-to-totality of native speaker levels (Wagner, Muse, & Tannenbaum, 2007). In addition, there is a general agreement that, on average, students join almost 3000 words a year to their reading vocabulary between the third and twelfth (3^{rd} and 12^{th}) levels (Yopp, H.K, Yopp, R.H., & Bishop, 2009).

Truly, learning language might be the most cognitively tough activity; however, where the grammar of the language consists of restricted group of rules, an individual improbably comes to an end of words to learn (Schmitt, 2000).

1.1.1.4. How Many Words do you Need to Use Another Language?

Fortunately, SL learners are not required to reach natives' vocabulary sizes but a set of lexis that permit the different ways of interaction in English. Nation(as cited in Schmitt, 2010), using word lists based on the Wellington Corpus of Spoken English, estimated that 6000- 7000 word families are needed to achieve that aim.

According to Nation's (2006) estimates, a vocabulary of 6000 word families (permitting listening) involves knowing 28 015 single word forms, whereas the 8000 families (permitting large reading) involves 34 660 words. At times, these word family members are obviously connected; (nation-national) are somewhat guessable in case not known. Yet, this is not the situation all the time (involve-involvedness), and learners may have problems with these less-obvious members, mainly in production.

Hence, and according to researches' proposition, SL learners are required to know huge vocabulary (though it is not a short-term aim). This is since researches on native speakers' vocabulary development consider that all words have the same worth. Yet, frequency centred researches see that certain words are a lot more functional than others. We identify four types of words: high frequency words, academic words, technical words, and low frequency words (Nation, 2001). We are going to talk about that in details at a later time.

In the following more contrasting definitions of what represents a word:

1.1.2. What is aWord?

1.1.2.1. Some Definitions

Carter (1998) thinks that a word, orthographically (orthography: a medium of written language), is a group of letters and some typographic symbols *"a sequence of letters (and a limited number of other characteristics such as hyphen and apostrophe) bounded on either side by a space or punctuation mark"(p. 4).* Yet, in written contexts, there are problems with orthographic word definition. For example, are *bring, brings, brought* or *good and better* different words that should be put independently in a dictionary? And what about words with identical form but dissimilar significances; like, *line* in railway *line*, or straight *line?* Are they one word or many?. This definition is incomplete as it is limited to the form of a word (Carter, 1998).

It may be, according to Carter (1998), more correct to define a word as *"the minimum meaningful unit of language" (p.5).*This permits us to distinguish the independent significances included in the word *fair* as they can be told to be different semantic units. But, there are individual units of meaning which are transmitted by more than a single word: *bus conductor, school teacher,* do they count as one word or two?. These words, also, might have different interpretations; for example, *police investigation* that either means an investigation *by* thepolice or an investigation *of* the police (in a police corruption situation). Again, although words like *if, by, but, my, could, because, indeed* are not semantic components, the existence of these words in the dictionary weakens the latter definition of words which is drawn from Bloomfield (1933), and that is, to a certain extent, adequate. The idea here is to emphasize the basic stability of a word. This is derived from the truth that a 'word' is a word if it can work as a response to a question or as statement or exclamation. It is easy to think of circumstances in which words like: *Goal!*or*Taxi!*could appear separately. Hence, according to that definition, a word has a stability that does not permit more shortening of the form. However, words like *my* or *because* could not take place separately without context. Moreover, idioms like 'to rain cuts and dogs' (rain heavily) cannot be shortened without harming the meaning (Carter, 1998).

Another definition of a word, by Carter (1998) is that it *"will not have more than one stressed syllable" (p. 6).* So, *cats, veterinary* are obviously words, but forms like *if, but, by, them,* do not take stress apart from when a specific significant impact is needed. Also, some of compound words like *bus conductor* would be described as individual words (Carter, 1998). Ur (1991) thinks that it would be more functional to tell about vocabulary 'items' instead of words.

For anybody the term *word* isvery general to sum up the many forms vocabulary holds. *Die, expire, pass away, and give up the ghost* aresynonymous with the meaning 'to die'. Moreover, the term *word* has complexities with the numerous grammatical and morphological variations of vocabulary. Are *simulate, simulative, and simulation* one word?. In this example, there is a *base, root, or stem* word that is the minimal form of that word. Attaching affixes to the stem produces either an *inflection* (in case the aim is grammatical) like *walked, walking, walks* that are inflections of the root word *walk*, or results in *derivations* (when the affixes alters the word class of a stem). Hence, *simulative* (adjective) and *simulation* (noun) are derivative of *simulate* (Schmitt, 2000). Groups of these words that vary *orthographically* (written forms) but strongly associated in meaning are called *word families.* As mentioned before, a word family involves the base word, all its inflections, and its derivatives. The term *Lemma* ismore limited, involving just the base and its inflections (Nation & Waring, 1997).

This terminology clarifies the possible vagueness of word, and permits to talk about vocabulary in more exact terms when needed. Also, there is a proof that the mind classifies the members of word family all together, offering a psychological explanation for utilizing word families as a unit for counting and teaching; the statement that frequency of usage has a strong influence on pace of word identification can be used as a means to deduce how word families appear in the lexicon mind. Studies demonstrated that the frequency of inflections and derivatives has the same effect on the identification of a stem as the frequency of the stem itself, which would be a solid proof for the theory claiming that the members of families share only one lexical entries. For example, when encountering the word *untie*, ‘un’ is put apart and the entry for ‘tie’ is checked in the mental lexicon. The meaning of untie which is to invert the work of tying is figured afterwards (Nagy, Anderson, Schommer, Scott, & Stallmann, 1989).

In addition, the verbs might consist of multiword units (like multi-word verbs 'to catch up on', phrasal verbs 'to drop in', and idioms 'kick the bucket [die]'). To deal with these multiple words, the term *lexeme,* also *lexical unit* or *lexical item* was created (Carter, 1998). These three items are altogether defined by Schmitt (2000) as a unit with a distinct significance: *"an item that functions as a single meaning unit, regardless of the number of words it contains" (p. 2)*. Lexeme is an abstract concept/ item which involves a number of the grammatical variants. BRING is a lexeme involving 'bring', 'brought', 'brings', 'bringing' that stand for word forms (a lexeme is commonly referred to by upper-case letters and quotation marks are utilized for its word forms). Lexemes are the fundamental elements of vocabulary in a language. In a dictionary, we are searching for lexemes (not words) which are abstractions that carry out word-forms (Carter, 1998). With respect to degree of abstraction, words can be considered either in terms of types or tokens (effective appearance of whatever item); the phrase Going, going , and gone will be thought of to consist of three words with regard to tokens but just two words (going, gone) with regard of types (Singleton, 1999). Moreover, the concept of lexeme helps us to embody the polysemy –the presence of numerous significances- in single words. Hence, *fair* (*n*.), *fair* (adj.[1] as in good) and *fair* (adj.[2] as in light in colour, mainly for hair), would have three different lexeme significances for the same word-form. However, there are less definite types. If we take the lexeme *line* (draw a line; railway line; clothesline): is the same surface form made by one, two, or three detached lexemes? And are the significances of *paper* (newspaper; college paper) specifications of the same main lexeme (Carter, 1998).

Again, should we speak about *words* or *word-forms* or *lexemes*? It is obvious that the use of words: *word* and *vocabulary* have a general relevance when specificity is required. The word *lexeme* and *word-forms* of a lexeme are used in theory (Carter, 1998).

1.1.2.2. Grammatical and Lexical Words

Grammatical words, on the other hand, include a fixed group of words that comprises pronouns (I, you, are), articles (that, a), auxiliary verbs (must, could, shall), prepositions (in, on, with, by), and conjunctions (and, but). They are called 'functional words', 'functors', 'empty words', too (Carter, 1998).

Lexical words or 'full words'/ 'content words' involve nouns (cat), adjectives (large), verbs (find), and adverbs (luckily). They convey superior information and are syntactically made up by the grammatical words (Carter, 1998).

1.1.2.3. Word Formation

A significant notion in word formation is the term 'root'. Morphemes (the slightest meaningful element in a word) are two categories: **root** and **non-root.** Non-root morphemes have grammatical role and do not have particular significances. Roots are lexical words that have particular significances. Examples of non-roots are by, of, to, this, s, er, ist, among them, the last three items are called bound non-roots as they have to be linked to a free morpheme or a free root to produce a word-form. Generally, a common term for bound non-roots is affix, prefix and suffix, which are combined with free morphemes to make inflections and derivations. In English, the majority of roots are free, however, a word such as *dentist* is composed of an affix *ist*and a root *dent* that is bound. *Dent* cann*ot appear* alone (Carter, 1998).

Identifying the structure of words is essential; the learners can go far in relation to decoding new words if he or she can distinguish familiar morphemes within them (McCarthy, 1990). If learners know the significance of sub- and un-, this will aid them guess the significance of words like *substandard, ungrateful, and untranslatable.* Yet, they should be careful with words like *subject* and *comfortable,* where the affixes do not have a clear relationship with their root significance.

1.1.2.4. Multiple Meanings

Polysemy (the presence of a number of significances in a single word) can generate significances which are relative or separate. *Race* for example ('run in a race'; 'ethnic group') has very vague significances (Carter, 1998). Likewise, a bound morpheme non-root (an affix) like *less* can induce several significances. For example, the *less* in *helpless* and *faultless* are different from that in *priceless*. This *affix* creates derivations that are often adjectives or adverbs; however, they have five essential semantic roles produced in words which (1) *'lack something'* and that have negative assessment, e.g. hopeless, tasteless, (2) are *'free from'* something and that have a positive assessment, e.g. faultless, spotless,(3) are *'without something'*, e.g. doubtless, sinless,(4) communicate situations further than common boundaries, e.g. resistless,(5) '*suggest intensity'*e.g. priceless. Generally,the significances given by morphemes are not easily identifiable. Extra complexities with numerous significances happen with *homonyms*(set of words with the same spelling but dissimilar significances) and polysemous items (e.g. lap), besides with *homophones* (words with the same pronunciation) (Carter, 2012).

1.1.2.5. Componential Analysis

Reference or denotation is extralinguistic, i.e. it stands for things in the extra world. Simultaneously, it should be identified that words have sense relation: the system of linguistic connections where bonds exist between lexical items. The theory of componential analysis, based on the principle that *semantic attributes*are set on the basis of semantic*opposition*or dimensions of *dissimilarity,* is fundamental to study that.It stands for a method to illustrate meaning connections by splitting every word into its unbreakable semantic elements. For example, *woman* can be identified as + HUMAN+ADULT-MALE, while boy can be identified +HUMAN-ADULT+MALE. So, these semantic information permit us to distinguish *woman* and *boy* from *man, girl, house,* etc (Carter, 1998).

However, componential analysis involves several problems among which suitably restricting the procedure of classification is the major one. For example, there are no constraints to the sub categorization of items. The word 'seal' can be described as +ANIMATE and –HUMAN though also viewed as –HAIR +MAMMAL (Carter, 1998). Again, analysis vary from one person to another , + hair, for example, is just a label for semantic features, not true words, though illustrating words that are difficult to express in words is what CA does. Also, for various words, meaning is best tackled by means of analogy. Red, for example, is best illustrated as the colour of blood (McCarthy, 1990).

1.1.2.6. Structural Semantics: Words and Other Words

The fundamental notion of a structural semantic approach to word significance is that words do not occur alone; their significances are recognized through the sense relation they have with other words. The relationships are of synonymy, where one linguistic form has the same significance though that won't be identical in every context; of antonyms or opposites, and hyponymy where common and particular linguistic items connect, like the case with *roses* and *tulips* (Carter, 1998).

1.1.3. The complex Nature of Vocabulary

The techniques of vocabulary learning involves that words are progressively learned by exposure through time. Every one of us has gone through the experience of understanding words from context without being capable of using them. This usual condition reveals different levels of knowing a word. Being capable of understanding a word is recognized as *receptive knowledge* (receptive knowledge), that is usually related to listening and reading; and *productive knowledge* (active knowledge) that refers to the capacity to produce a word of our own when speaking or writing. It is presumed that receptive knowledge of words precedes productive knowledge; however, it is not always the case in language learning (Schmitt, 2000).

We may think that vocabulary knowledge involves two aspects - meaning and word form. Brown (in press) reached the conclusion that the nine general English textbooks he scrutinized pay more attention to meaning and form (with some consideration of grammatical function) and left out other types of word knowledge that is frequently named the quality or 'depth' of vocabulary knowledge (Schmitt, 2010). Anderson and Freebody (1981) wrote on depth and breadth of vocabulary knowledge:

> *the first [type of vocabulary knowledge] may be called 'breadth' of knowledge, by which we mean the number of words for which the person knows at least some of the significant aspects of meaning... . [there] is a second dimension of vocabulary knowledge, namely the quality or 'depth' of understanding. We shall assume that...a person has a sufficiently deep understanding of a word if it conveys to him or her all of the distinctions that would be understood by an ordinary adult under normal circumstances(pp. 92-3)*

Nation (1990) suggests a list of various types of word knowledge (not essentially learned at once) required in knowing a word:

-*The meaning of the word*
-*The spoken form of the word*
- *The collocations of the word*
- *The associations of the word*
- *The written form of the word*
- *The grammatical behaviour of the word*
- *The register of the word*
- *The frequency of the word*

From the other side, we have to stay conscious that the different kinds of word knowledge are interconnected. For example, frequency is connected to formality (branch of register) in the sense that more frequent words are likely to be less formal. Hence, a word knowledge feature could aid enhance knowledge of other features (e.g., Schmitt & Meara, 1997; Schmitt, 1998). So, despite the fact that we can use a word-knowledge viewpoint to explain *'what does it mean to know a word'*, we shall delay and observe if it can be utilized to illustrate lexical acquisition and processing (Schmitt, 2000).

1.1.4. History of Vocabulary in Language Learning

People have tried to learn a second language from the time of the Romans or a little earlier. Since then, there has been different approaches to language learning, everyone with a different viewpoint on vocabulary (sometimes it was ignored) (Schmitt, 2000).

1.1.4.1. Language Methodologies through the Ages

In the 19th century, *Grammar Translation Method* was the major teaching approach by which a lesson is based on translation from L1 into L2, one or two grammar rules, and a list of Vocabulary items. However, the content emphasized getting the learners ready to reading and writing literary matters (Howatt, 1984), and the major standard for vocabulary choice was frequently its capacity to explain grammar rules (Zimmerman, 1997). Learners were supposed to learn the required vocabulary by themselves, using bilingual dictionaries (Schmitt, 2000).

Grammar Translation Method turned out to be difficult to understand, as it emphasized language scrutiny over language use, besides that reading and writing are slightly significant to develop the speaking skill. Hence, in the end of the 19th century, a new method, based on language use, emerged: *the Direct Method*. It focused on exposure to listening as a major skill, and meaning was associated to the target language with no translation. It replicates the mother tongue as it is learned naturally, starting by listening, speaking, then reading and writing. The emphasis was on use of the second language and vocabulary would be acquired naturally by Communication throughout the lessons. Concrete vocabulary was illustrated with images and body language. So, vocabulary was associated with the real world whenever possible. Abstract words were explained through connection of ideas for example (Zimmerman, 1997).

One of the main drawbacks of the direct method is that it does not consider the differences between L1 and L2 acquisition; L1 learners have richly been exposed to the language, which is not the case with second language learners. In the United States, the 1929 Coleman Report found that it was not enough to improve language proficiency, hence teaching reading (in the second language) to L2 learners was called for, as the most useful skill (Schmitt, 2000).

Throughout the *Second World War,* the American military was lacking fluent people in L2. And since the drawbacks of the previously mentioned approaches turn out to be evident, another tool to rapidly teach the soldiers oral skills was required. Hence, American structural linguists build up a course drawn from the Direct Method (its main focus is on listening and speaking). It was based on behaviourism, which considers that learning was an outcome of practice. So, the method involves tasks like rigorous concentration on pronunciation, heavy oral drilling, an emphasis on sentence styles, and memorization (Schmitt, 2000).

After the WWII, this method was called the *Audiolingualism*, in which the vocabulary was required to be quite easy (simple and frequent) (Zimmerman, 1997). Coady (1993) claims that growth in vocabulary size is the ultimate result of language practice and exposure to it: *"It was assumed that good language habits and exposure to the language itself, would eventually lead to an increased vocabulary" (p. 4).* Thus, no method of improving vocabulary was developed soon after.

By the end of the 1950s, Chomsky criticized the behaviourist emphasis on Audiolingualism. Removing the bihaviorist notion of habit formation, language at this time was viewed as ruled by cognitive factors, more precisely a group of abstract rules that were supposed to be inborn. In 1972, Hymes included the notion of communicative competence which asserted sociolinguistic and pragmatic features. This aided to shift the emphasis form language 'correctness' (accuracy) to how proper language was for a specific context 'appropriatness'. The method that appeared from these concepts focused on using language for significant communication –Communicative Language Teaching (CLT). The emphasis was on the idea and fluency instead of grammatical accuracy. It was taught via problem-solving tasks, and activities that demand to deal with information, like feeling the blank exercises (CPF) (Chomsky, 1950; Hymes 1972; cited in Schmitt, 2000).

However, in this approach, based on meaning, vocabulary was offered an inferior position but this time for matters dealing with functional language (e.g. how to make a request or apology). CLT offers a slight assistance for how to make use of the vocabulary of the language, except, as guidance other than as help vocabulary for the functional language use. At present time, it has been assimilated that exposure and practical interaction will not guarantee the acquisition of enough vocabulary. So, best practice involves good choice of vocabulary, usually depending on frequency lists, and a teaching methodology that encourages frequent exposure to words (Schmitt, 2000).

1.1.4.2. The Vocabulary Control Movement

The majority of previous methods didn't truly know how to tackle vocabulary, as they relied on bilingual word lists or wishing it simply be learned naturally. It is until the 20th century that methodical work starts on vocabulary. One main element of lexical research relate to the modelling of vocabulary in discourse, developing since about the 1980s with the coming of computer analysis methods. Another main element of lexical research is to arrange the choice of vocabulary. As it involves a trial to make it easier by controlling it to a certain extent, the study was called: *the Vocabulary Control Movement* (Schmitt, 2000).

There were two approaches. The first tried to restrict English vocabulary to the maximum for more obvious communication of ideas. In the 1930s, C.K Ogden and I.A. Richards made a vocabulary with just 850 words (called Basic English), which they said could be rapidly learned and could express any significance that could be conveyed in usual English (Carter, 1998). Yet, Basic English does not have a huge long term influence. Regardless of the small amount of words, it was not essentially too easier to use as the learning of several words was replaced by the learning of several *meaning senses* (Schmitt, 2000). Nation (1983) considers that the 850 words of Basic English have 12 425 meaning.

There has also been the practical problems about recycling the teachers to use the 'new' language, and the lack of items like *Good-bye, Thank you, Mr, Mrs,* that are necessary for social communication, as well as frequent words like *big, never, sit,* or *want* (Schmitt, 2000).

Second, more prosperous approach, in the Vocabulary Control Movement was to use methodical standards to choose the most helpful words for language learning. This was partly in response to the Direct Method, which offered a slight assistance on the choice of either content or vocabulary. Researches in this scope have been carried out at the beginning of the 20th century and the efforts resulted in the *Carnegie Report* (Palmer, West, & Faucett, 1936). The report proposed the elaboration of a list of vocabulary that would be helpful in simplifying the reading materials. Word frequency was a major standard for the choice of the words on this list, but the problem is that the vocabulary needed in any circumstance relies on the context in which it is used (Schmitt, 2000). Hence, ultimate words on the list were chosen through a broad list of standards made by Howatt (1984), mainly:

1. Word frequency
2. Structural value (all structural words [function words] included)
3. Universality (words likely to cause offence locally excluded)
4. Subject range (no specialist items)
5. Style ('colloquial' or slang words excluded)

In the end, the list consisted of around Two thousand words, and was eventually published as the *General Service List of English Words* (GSL). The benefit of the GSL is that the different parts of speech and the different meaning senses are listed, which make the list a lot more useful than a simple frequency estimate. The GSL has been hugely useful, but, as it is founded on very old word estimate, it is being reviewed (Schmitt, 2000).

1.1.5. Knowing a Word

Words are not separated units, yet suit into several overlapping systems and levels.

For this reason, there are a lot of things to learn about every specific word and there are different levels of learning. The link between item knowledge and system knowledge is intricate (Nation, 2001).

The *'learning burden'* in learning words differs from one word to another. The common rule of learning burden is that the more a word's *patterns* and *knowledge* is known to the learner, the less is the learning burden. These patterns and knowledge of words might be from the mother tongue, other languages, or prior knowledge of the language taught (Nation, 2001).

1.1.5.1. Aspects of Knowing a Word: Meaning and Organization

1.1.5.1.1. Word Meaning

Meaning is composed of the relationship between a word and its referent (the person, thing, action, and the situation it represents in the actual or virtual world). Such relationship is random till approved by the people using the word (Drum & Konopak, 1987). The animal with a very long neck in Africa could have been named a *golf, a glisten;* it is just within the English speaking community that the name of this animal should be *giraffe*. Yet, there are exclusions where words have an inherent association with their referents, like *onomatopoeic* words. They try to imitate the sound they refer to: *boom, whoosh*. Here, again, the association is relative, as many languages present these sounds in many means; for example, the noise of a rooster is presented cock a doodle do (English), cucuricu (Spanish), kukuliku (Swedish), and kokikoko (Japanese) (Schmitt, 2000).

Unluckily, the relationship between a word and its referent is not often an orderly straight one (Abraham Lincoln, *Eiffel Tower, Brazil).* There arevarious types of uniforms that the individual word *uniform* cannot precisely illustrate everyone. Relatively, it refers to what our *notion* of a uniform usually is like. We know that it is a homogenous form of a dress, yet would be very prone to dissimilarities in colour, for example. Hence, our notion of a uniform

relies hugely on our exposure to uniforms of several kinds. So, for the majority of words, we can more properly talk of meanings as the relationship between a word and its concept, instead of referent (Schmitt, 2000).

Nagy (1997; as cited in Nation, 2001) indicates that there are two important means in which language users can handle associated senses:

1- When the word form is encountered, the user has to use the proper meaning of the word from those retained in the mind. This operation is named 'sense selection'.

2- When the word is encountered, the learner has to find out throughout the process of understanding what specific concept the word indicates. This is called 'reference specification'. If we are told that John would be here at 6pm, we have to decide which specific John is being indicated.

Ruhl (1989; as cited in Nation, 2001) argues that we should presume that every word has a sole lexical sense. When we understand a word in context, there are two main origins of significance: the lexical sense (what it indicates as a detached word), and the inferential sense that we deduce from other words in the context, and from our knowledge of the world. Ruhl gives proof to sustain his attitude by scrutinizing various examples of use and confirms that perceptible differences in significance can be explained by deductive significance, and that a constant still abstract significance can be observed

Here again, the greater part of words do not have a one-to-one relationships with a particular referent. This causes problems in definition as it is difficult to define a category. For example, as the notion of *cat* must include a broad range of cats, a definition of each cat would not be adequate. As an alternative, we must decide on the features that define the category of cats, as described in Figure1. Establishing the list of semantic features may permit us to reach the conclusion that *cat* has a constant meaning. However, deciding on the needed and adequate characteristics is not easy. A second problem is about determining which characteristics should take place on the list (Schmitt, 2000).

In fact, any cat is expected to have several of the characteristics mentioned though not others. Hence, the meaning of *cat* is flexible (Schmitt, 2000). Aitchison (1987; as cited in Schmitt, 2000) names this flexibility ‘fuzzy meaning’. There is a fuzzy border between *walk* and *run* as the point at which walking becomes running is not obvious. Aitchison assumes that the majority of words are, to a certain extent, fuzzy in their meaning.

	four legs	Whiskers	Furry	claws	Meows	Large	chases mice	drinks milk	Aloof [no friendly]	parts with tongue out
Cat	+	+	+	+	+	-	?	+	?	-

Figure 1: Semantic features of cat (Schmitt, 2000).

Yet, *Prototype theory* about how people treat fuzzy meaning suggests that the mind uses a prototypical ‘best example’ of a concept as a substitute to the presumption that concepts are defined by an amount of semantic features. People inside a culture tend to have rather the same idea concerning what the best examples are. For example, Americans think of Robins as the best example of a bird, as he stands for the features people very frequently relate to birdiness: like, flying, resting eggs, making nests, and singing. On the other hand, penguins and ostriches had sufficient ‘birdy’ attributes though not standard ones. Hence, prototype theory can clarify how uncommon situations (three-legged cats) can be yet believed to fit in a concept (Schmitt, 2000).

Prototype theory can aid clarify the implication or not of element in a concept class, by comparing a word and its concept with other words and their concepts. Research on meaning connections and meaning in general is usually named *semantics*. The classes of meaning relationships between words are named *sense relations.* In the following figure, the domain of semantics has created technical terms to more exactly convey their relationships (Schmitt, 2000).

Sense Relation	Word	Attribute	Examples
synonymy	Synonym	Similarity	huge-gigantic rich-wealthy
ungraded antonymy	ungraded antonym	exclusive oppositeness	alive-dead pass-fail
graded antonymy	graded antonym	oppositeness on a continuum	big-little hot-cold
hyponymy	hyponym		
	superordinate (hyponym)	more general category	vehicle-car fruit-apple
	coordinate	same level of generality	car-truck apple-orange
	subordinate	more specific category	car-ford apple-crab apple
meronymy	meronym	whole-part	bicycle-wheels handle, seat

Figure 2: Sense relations (Schmitt, 2000).

Mainly in the situation of ranked antonyms, the meaning of a word is affected by the others. For example, the absolute temperature of a night in Madrid might be somewhat different from a night in Moscow, but both might be considered *cool. Cool* does not relate to a specific temperature in these situations, yet originate in people's understanding of temperature. Hence, cool may indicate inconsistent absolute temperature, yet linguistically it will take place between cold and warm, all the time (see Lyons, 1977, for a fuller discussion of semantics) (Schmitt, 2000).

Word meanings cannot be limited by a definition or a group of semantic features. Despite the fact that these may provide significance for a word's meaning, context has a vital role in giving other information required to use the word (Schmitt, 2000).

1.1.5.1.2. Register: Denotation and Connotation

Core meaning indicates the most essential meaning components, the type of meaning that dictionaries attempt to seize in their definitions; this is called *denotation* of a word meaning. Further meaning information related to the mental connections, or positive or negative feelings it induced, which may or may not be mentioned in the dictionary is called *connotation* (Ur, 1991). For example, if we take the word *skinny* that signifies very thin (which is the denotation), a lot of people would be happy to be depicted so. However, skinny conveys the connotation of 'so thin as to be unhealthy or unattractive'. Hence, skinny can be used to talk about hungry children. So, further meaning information give variety to the word and restrict the way we use it, this is called *register*. It depicts the alternatives that make every word somewhat proper for some cases or language aims (Schmitt, 2000). Hence, vocabulary selection, perhaps a main aspect in registers, is mainly controlled by who is telling what, to whom, when, and why. The aspects (of selection) which limit this selection are well described in Halliday's model (as cited in McCarthy, 1990) of the elements of cases in which language is used, which are: field (topic), tenor (relationship between correspondent and recipient) , and mode (means of interaction; phone call, written report, etc). For example, 'fags' is not likely to appear in a formal scientific article on smoking and health.

1.1.5.1.3. Word Associations

Words connect to each other through different means among which association with other parallel words, usually via sense relations, or by having different parts (a shared root and different inflectional and derivational affixes). The learning of words will be easy if they contain already knowing parts. Hence, knowing a word includes knowing the elements of its word family that boosts as competence improves (Nation, 2001). According to Nagy et al. (1989), for native speakers, the rapidness of identifying a word was expected more from the overall occurrence of its word family than from the occurrence of the specific word form itself.

The previous relationships indicate certain kind of basic mental relationships in the mind. Truly, presuming that there is no relationship between words in the mind is synonymous to presuming that the mental word list are not organized, and that words exist completely separated (Schmitt, 2000).

One of the study hypotheses that examine the arrangement of the mental lexicon most straight entails the use of *word association*. In association methodology, perhaps best known from the domain of Psychology, a stimulus is presented to subject who are required to answer with the first word or words that cross their mind. For the stimulus word *needle,* usual answers would be *thread, pin(s), sharp,* etc. The hypothesis is that spontaneous answers will involve words that have the most powerful match with the stimulus word in the subjects' lexicon. So, not connected answers like *sky* or *study* would not be expected. By investigating associations, we can get evidence about the mental associations between words and hence the arrangement of the mental lexicon (Schmitt, 2000).

Association involves three most essential groups. **Clang associations** where answers resemble the stimulus word in form, like *reflect, effect*. The two other groups are concerned with the associations' word class. There are **syntagmatic associations** that have different word classes. Examples would be verb-noun couples like *abandon-skip,* or adjective-noun couples like *gay-abandon*. Answers of the same word class as the stimulus are named **paradigmatic associations.** Examples would be of verb-verb couples like *abandon-leave.* While syntagmatic relationships include the nearness of words in language, paradigmatic relationships are more semantic of the kind (related to meaning). At times, paradigmatic couples are approximately synonymous (*blossom-flower)* and at other times they represent other types of sense relation (*black-white, table-furniture*) (Schmitt, 2000).

Examining the association in relation to these groups offers hints about the process in which words are acquired. Perhaps the most well-known results in association studies is that answers change from being mainly syntagmatic to being paradigmatic as a person's language grows up. However, there is a decline in Clang associations through time. Woodrow and Lowell (1916) have found that L1 children have different associations from adults. After that, Ervin (1961) found that the amount of paradigmatic learners' answers grows through the different classes. The study was confirmed by Sharp (1972) who examined African subjects who talk Kpelle. However, this change happens at different times for different word classes. Entwisle and her colleagues (1964, 1966) propose that nouns are the earliest to change, followed by adjectives. The change starts afterwards for verbs and is slower (Entwisle & her colleagues, 1964-1966; Ervin, 1961; Lowell, 1916; Sharp, 1972; cited in Schmitt, 2000).

The huge level of agreement in native answers proposes that the lexicons of different native speakers are arranged alongside alike ways. If natives have a 'normal' or 'preferred' organizational model, then it seems that non-native would profit if their lexicons were arranged likewise. We still don't know how to make this possible, however, because answers generally have either syntagmatic or paradigmatic associations with the stimulus words, these associations could be essential in vocabulary teaching and learning. As for the way lexical organization alters through time, the existence of clang associations implies that word-form relations can primarily be useful in the initial lexical arrangement of native children. However formal likeness is clearly not a much favoured means of arranging the lexicons, since proved by the quick loss of clang association as learners grow up. Syntagmatic associations are the following to be concentrated on by the youthful learners, proposing that a main feature of a language at this level is adjacency. After that, the learners' associations turn out to be more meaning based and paradigmatic. Yet, not each single word goes through this evolution, and through age clang associations disappear. Instead, the evolution denotes the broad progression of lexical arrangement models as a learner's languages grows up (Schmitt, 2000).

Studies on associations have been employed to the second language acquisition studies. Meara (1980, 1983; as cited in Schmitt, 2000) found out many features of L2 associations. Primarily, despite the fact that L2 learners normally have a limited vocabulary size comparing to natives, their association answers are a lot less usual and unlike that of natives. This is, to a certain level, for the reason that L2 answers usually involve clang associations. Moreover, it is probably since the arrangement of L2 learners' mental lexicons is often less developed. Next, L2 subjects frequently misinterpret the stimulus words, which directs to fully unconnected associations. Third, learners such as L1 children are inclined to make more syntagmatic answers comparing to natives with more paradigmatic answers. Fourth, L2 answers are somewhat changeable, but approach that of natives as they acquire proficiency in the language.

Three further types of knowledge are required to differentiate between nouns: parts, attributes, and functions. House is a hyponym of *building* and it has some parts (bedroom, kitchen) and a particular function (for people to reside). The whole-part relationship (house-kitchen), is named meronymy (*kitchen* is a meronymy of the holonym *house*) (Nation, 2001).

There are many other links like 'troponymy' that communicates the notion that something is made in a certain way. To *stroll* is 'to march in a certain way' (Nation, 2001).

Miller and Fellbaum (1991; as cited in Nation, 2001) name it 'entailment', which suggests that getting involved in an act implies getting involved in another. *Snore* encompasses *sleep*, *win* encompasses *play*.

1.1.5.2. Aspects of knowing a word: Word Form and Grammatical Knowledge

1.1.5.2.1. The Written Form of a Word

Despite the fact that people would think of meaning as the main feature of knowing a word, there, lately, has been a growing consciousness that *orthographical* (written-form) knowledge is a main element to vocabulary knowledge and language processing (generally) as well (Schmitt, 2000).

Studies on reading have demonstrated the importance of the word's written form. The most common reason of unsuccessful guessing from context (in one research) was confusing not known words like *optimal* with words which spelling is familiar like *optional*, sustaining Haynes's (1993) statement that word-form familiarity can regularly take priority over contextual knowledge. Moreover, there is a solid relationship between spelling and reading; talent at reading can affect that of spelling, and there is proof that literacy can influence phonological schemes (Haynes, 1993; cited in Nation, 2001).

Considering the second language orthographic information from a crosslinguistic viewpoint [relating to different languages], it is obvious that L1 learners' orthographic structure has a vital role in forming his or her L2 processing. The learning of the written form of words is highly influenced by first and second language similarities and by the learners' familiarity with the spoken form of the second language vocabulary. There exist three main kinds of orthographic systems used in language all over the world –logographic, syllabic, and alphabetic. In logographic systems, the *grapheme* (shortest unit in a writing system) stands for a concept, as in the Chinese writing system. In syllabic systems, the grapheme stands for syllables, as in the Japanese language. In alphabetic systems such as

English, the grapheme represents *phonemes* (shortest unit of sound that can differentiate two words, e.g. *p*an and *b*an. Everyone of these systems guide to dissimilar processing approaches. It is probable that these approaches are transmitted into the L2 (see koda, 1997, for more on these issues) (Nation, 2001).

To explain these crosslinguistic orthography problems, let's take the example of Arabs' learners of English. The problem these learners have with the English orthography is rooted in the statement that Arabic is founded on triconsonantal stems, and vowels with a secondary position. While recognition methods founded on these triconsonants are transmitted into English, there might be a non concern of vowels that leads to not recognized words: moments for example being not distinguished from monuments (Schmitt, 2000).

1.1.5.2.2. The Spoken Form of a Word

When it comes to the spoken form of a word, the major problem for the majority of the language learners concerns the action of listening. This is for the reason that learners control over the speed of input is restricted, not like reading where they can read unhurriedly or even review the entire texting. And in opposition to written discourse, spoken language does not have obvious word limits; the words merge in speech to the point that if one does not really know a language, it is so hard to distinguish any separate words whatever. Sometimes, even natives break away the speech flow mistakenly. For example, the sound of how big is it? is perceived as how bigoted? (Schmitt, 2000).

So many theories have tempted to illustrate how the phonological representations, separated from speech flow, are used to relate the parallel lexical words. Cohort models propose that words are essentially identified from left to right. If we take the word *candle*, when hearing the primary phoneme /K/ (symbols that designate sounds), the mind stimulates all words starting with this sound. Follows the second phoneme /æ/, which matches with the letter ‘a’, and the list is restricted to words starting with ca-, till the list is restricted to the point of identification. Meanwhile, context is used to reject words that are unsuitable. However, this model can’t explain the identification of a word with misspoken first phonemes, for example a drunk pronouncing *shigarette* in the place of *cigarette*. Also, another problem is caused by the context restriction (Schmitt, 2000): Garnham (1985) explains that cohert model (which proposes that words are mainly recognized from left to right) expects that the words which are inappropriate for the context are neglected when he says: *"words that do not fit with the context are dropped from consideration, the model predicts that words cannot be recognized in inappropriate contexts" (p. 57)*. Moreover, studies have shown that longer French words (of four syllables) were identified more properly and rapidly than one-syllable words when heard in fluent associated speech. And despite the fact that the Cohort model expects that shorter words should be identified more rapidly, in fact longer words may be more easily identified because the mind is not certain that a one-syllable word is not a portion of longer one. Example: *to* can be the starting of *tomorrow* (Schmitt, 2000).

Generally, the rate of word identification is very quick. Natives are quick to identify a word in almost two hundred milliseconds. However, the recognition of a word can at times happen just after several successive words have formerly been heard. This is because in associated speech it is not easy to learn if following sounds are segments of a longer word or the starting of a new word (Schmitt, 2000).

Phonological consciousness is vital for general vocabulary learning, Goldstein (1983) proposes that undergraduate L2 learners must concentrate a lot on auditory hints than natives, as they cannot recompense native-like knowledge of semantic and syntactic restrictions to guess and decipher words. For example, a native speaker will rarely fail to distinguish between *aptitude* and *attitude,* as the context would make obvious the right choice even if the word is not heard obviously. But less able L2 learners are not sufficiently proficient to properly understand the context and hence would have to concentrate only on accurate hearing of the word (Goldstein, 1983; cited in Schmitt, 2000). Also, studies by Gathercole and Baddeley (1989) show that a crucial feature affecting vocabulary learning is the capacity of learners to keep a word in their phonological short-term-memory. This is affected by the learners' capacity to break up the spoken form of a word into significant elements, which in turn relies on L1 and L2 resemblance and the learners' competence (Gathercole & Baddeley, 1989; cited in Nation, 2001).

Research proposes that the more words you learn, the simpler is to learn new words because of the phonological aspects. According to Service (1992), the role of the phonological short-term-memory is possibly primarily essential when starting to learn a new language because there is constantly few other appropriate knowledge to link new forms to (Gathercole & Baddely, 1993).

1.1.5.3. The receptive/ Productive Distinction

Receptive holds the notion of assimilating (acquiring) language knowledge due to listening or reading and attempting to understand. It includes mainly recognizing the form of a word and retrieving its sense. Productive includes intending to communicate ideas due to spoken and written word form. Like the majority of terminology, receptive and productive terms are not totally appropriate because there are productive aspects in the receptive skills –when listening and reading we make sense. Passive (for listening and reading) and active (for speaking) are used as synonyms of receptive and productive. yet, these terms do not perceive listening and reading as having some of the other features that can be related to the word passive (Nation, 2001).

Reception and production is not the only means of seeing division. Meara (1990; as cited in Nation, 2001) perceives the division between active and passive vocabulary as being the outcome of various kinds of correlation between words. Active vocabulary can be stimulated by other words since it has numerous internal and external connections with other words. Passive vocabulary includes items which can just merely be stimulated by exterior incentives, i.e. they are stimulated by hearing or seeing their forms, without connecting with other words. Thus, Merea perceives that active and passive corresponds to various types of correlational knowledge. One disapproval of this position might be that language practice is not merely associational, yet is based on sense.

Generally, identification of receptive vocabulary is wider than productive vocabulary. Initiation to reading lessons is usually done by teaching children a group of instructors to decipher written words. If the words are there in the child's verbal vocabulary, understanding should take place as the child deciphers and examines the oral representations to communication. Yet, in case the written vocabulary is more difficult than the child's oral vocabulary, understanding does not happen. So, the process of deciphering a word to communication has a role not other than to alter its representation from written image to verbalization. Hence, comprehension is a task of oral language and word identification, i.e. comprehension of written language is a consequence of the capacity to decipher and identify words and oral language information (Hiebert & Kamil, 2005).

From Corson's (1995) perspective, the terms active and passive are more appropriate. His explanation of active and passive vocabulary is strongly derived from the notion of utilization, not only the levels of knowledge. Certain passive vocabulary may be very well learned but not utilized at all and consequently by no means active.

1.1.5.3.1. The Scope of the Receptive/ Productive Distinction

When receptive and productive are employed to vocabulary, they embrace all the features included in knowing a word. Table 2.1mentions these features using a model that focuses on the parts. Another probable model is a process model that focuses on the connections between the parts. Usually, knowing a word includes form, meaning, and use (Nation, 2001).

From the viewpoint of receptive knowledge and utilization, knowing a word, for example, *underdeveloped* includes:

-Being capable of distinguishing the word when it is heard.

-Being accustomed to its written form (while reading)

-Distinguishing that it includes the elements *under-, -develop-, -ed.*

-Knowing that underdeveloped indicates a specific sense.

-Knowing the sense of the word in the context where it comes.

-Knowing the idea of the word that will permit comprehending in different contexts.

-Knowing about associated words such as overdeveloped.

-Being capable to distinguish that *underdeveloped* is properly utilized in the sentence where it appears.

-Being capable to distinguish that words like *territories* and *areas* are perfect collocations.

-Knowing that underdeveloped is not an unusual word

(Nation, 2001).

From the viewpoint of productive knowledge and utilization, knowing the word *underdeveloped* includes:

-Being capable of pronouncing the word appropriately involving stress.

-Being capable of spelling the word properly.

-Being capable of structuring it using the appropriate word parts in their proper forms.

-Being capable of using the word in various contexts to communicate the scope of significances of *underdeveloped.*

-Being capable of giving synonyms and opposites for *underdeveloped.*

-Being capable of using the word appropriately in an authentic sentence.

-Being capable of giving words that are usually used with it.

-Being capable of determining whether the word fits the level of formality of the case (*developing* is more appropriate than *underdeveloped* which transmits a somewhat negative significance).

(Nation, 2001).

Table 1: What is involved in knowing a word

Form	spoken	R	What does the word sound like?
		P	How is the word pronounced?
	written	R	What does the word look like?
		P	How is the word written and spelled?
	word parts	R	What parts are recognisable in this word?
		P	What word parts are needed to express the meaning?
Meaning	form and meaning	R	What meaning does this word form signal?
		P	What word form can be used to express this meaning?
	concept and referents	R	What is included in the concept?
		P	What items can the concept refer to?
	associations	R	What other words does this make us think of?
		P	What other words could we use instead of this one?
Use	grammatical functions	R	In what patterns does the word occur?
		P	In what patterns must we use this word?
	collocations	R	What words or types of words occur with this one?
		P	What words or types of words must we use with this one?
	constraints on use (register, frequency...)	R	Where, when, and how often would we expect to meet this word?
		P	Where, when, and how often can we use this word?

Note: In column 3, R= receptive knowledge, p= productive knowledge.

(Nation, 2001).

Table 2.1.and the associated example underdeveloped offer a sign of the scope of features of receptive and productive knowledge and utilization. Mostly, it sounds that receptive learning and utilization is simpler than productive learning and utilization

(though the reason is not obvious), there are many probable justifications:
-The ‘amount of knowledge’. Productive knowledge is more complicated as it demands further learning of new spoken or written productive patterns (see Gow, 1986, for related argument). For example, small children show a good receptive knowledge of a word like spaghetti, yet can approximately know about its spoken form productively like *parasgheti;* the form of items is more expected to affect difficulty than sense, as more knowledge of significance than form is mutual between two different languages (Nation, 2001).

-The ‘practice’. Receptive utilization exceeds productive one. According to DeKeyser and Sokalski (1996; as cited in Nation, 2001), there is proof that receptive and productive learning mutually need special exercise to be appropriately learned. Yet, this argument was broken up by the one which sustains that productive knowledge involves the entire knowledge required for receptive utilization.

- The ‘access’. Ellis and Beaton (1993; as cited in Nation, 2001) propose that a new foreign language word in the first phases of learning has just one easy association to its first language (L1) translation (the receptive direction).

The receptive direction

Foreign word → L1 translation
Kaki → *leg*

Yet, the L1 has several fighting links (the productive direction), so productive remembrance is more complicated than receptive one because there are several fighting channels to select form, and the ones in the L1 vocabulary system are probable to be more powerful.

The Productive Direction

L1 word → Foreign word
leg → *kaki*

(inside the L1 lexical system)
→ collocates of leg
synonyms of leg →
opposites of leg →
etc →
(Ellis & Beaton, 1993).

-The 'motivation'. Learners are not motivated for many causes, involving socio-cultural background, to utilizing some types of knowledge productively. This vocabulary stays in the learners' passive vocabulary. From this viewpoint, the receptive/ productive difference is, for certain words, between motivated and unmotivated vocabulary (Nation, 2001).

1.1.5.3.2. Experimental Comparisons of receptive and productive vocabulary

To the best of our knowledge, there are just five (5) experimental researches contrasting receptive and productive L2 word learning, mainly Schuyten (1906), Stoddard (1929), Griffin and Harly (1996), Waring (1997), and Schneider, Healy, and Bourne (2002) (Bogaards & Laufer, 2004).

Schuyten (1906) conducted his experiments with Dutch speaking Belgian pupils learning French, German, and English words, where the experimental design in every case involved two sections and every section use different group of target words. For the first group of words, the sequence was: productive learning, receptive test and productive test. For the second group, the sequence was: receptive learning, productive test and receptive test. Schuyten found that, in every one of the three experiments, receptive retention was partially higher than productive retention, besides that receptive learning produces partial size of productive knowledge and Vice versa (Schuyten, 1906; cited in Bogaards & Laufer, 2004).

Stoddard (1929) is one of the first foreign vocabulary learning researchers to contrast receptive and productive vocabulary learning and to test with equivalent test designs. One of such researches leaded to that: Receptive tests are easier than productive tests. The score of the receptive test was two times superior to the productive test. Waring (1997) who carried an alike experiment has certified Stoddard's conclusion, besides he found that receptive learning does not require as much time as productive learning, and scores on productive tests were constantly down, through time, comparing to scores on receptive tests (Stoddard, 1929; Waring, 1997; cited in Nation, 2001).

Griffin (1992; as cited in Nation, 2001) who carried a chain of experiments on vocabulary learning, concentrating mostly on list learning and learning in context reached the point that receptive learning is easier than productive learning, and that the majority of forgetting happens shortly after learning.

Schneider et al. (2002, as cited in Bogaards & Laufer, 2004) conducted two experiments in which they needed American college students to learn a group of French words, while in every experiments, half of the students learned the words receptively and had a direct receptive retention test. This was done for productive test as well. The results demonstrated that the retention loss between the direct and retarded test was more important for words that were learned receptively than the words learned productively.

Employing a study in experimental psychology and language acquisition, Ellis (1994) differentiates between the form learning features of vocabulary learning (Ellis names them Input/ Output features) and the meaning features of vocabulary. The difference is found mainly in the type of learning most fitted to the different features. Moreover, Ellis argues for a disconnection between explicit and implicit learning where output is based on implicit learning but the meaning is based on explicit, conscious procedure.

Implicit learning includes attention to the stimulus. It is very influenced by recurrences. Explicit learning is more conscious. It seeks employing specific principles. It is very influenced by the characteristic of the cognitive functioning. What Ellis names *"mediational"* feature in associating knowledge of the word form to knowledge of the significance of the word (Nation, 2001).

What this signifies is that, mainly for high frequency words, teachers should demonstrate the significance of words, and learners should search in dictionaries and reflect on the significance. But after a short attention to spelling and pronunciation, practice on meeting and bringing out the word form should be permitted when use is concentrated on significance (Nation, 2001). The following table explains that:

Table 2: Kinds of vocabulary knowledge and the most effective kinds of learning

Kinds of knowledge	kinds of learning	activities
Form	implicit learning involving noticing	repeated meetings as in repeated reading
Meaning	strong explicit learning	depth of processing through the use of Images, elaboration, deliberate inferencing
Use grammar collocation	implicit learning	repetition
constraints on use	explicit learning	explicit guidance and feedback

(Nation, 2001).

1.1.5.4. Grammatical Functions

Word use requires knowing the part of speech it is. The grammatical learning of items relies on similarities between the first and second language and similarities in grammatical manner between words of associated sense. *Hate* and *like* have got parallel design, then to learn them will be easier because the earlier learning of the other functions as a pilot (Nation, 2001).

1.1.5.5. Collocations

Collocation is viewed as a process by which two or more words regularly co-exist. Sinclair (1991) defines collocation as: *"...the occurrence of two or more words within a short space of each other in a text. The usual measure of proximity is a maximum of four words intervening" (p. 170).* On the other hand, Lewis (1997) considers that collocation seems to be like an idiom or a phrasal verb in that it cannot be explained.

Woolard (2000) expands the previous definition when he said:

> *"...we can offer no explanations to our students for particular choices that are selected and sanctioned by the Speech community beyond saying 'this is simply the way the language is'. We should resist the teacher's automatic reflex of seeking explanations for all aspects of language patterning" (p. 34).*

Knowing a word encompasses knowing the words it goes with. For example, to tell that we ate certain *fast food* (Nation, 2001). Pawley and Syder (1983) argue that what causes us to be able to talk our first language fluently and select word chains that made us seem like native speakers is that we have stocked huge amounts of retained chains in our mind.

Collocations is a marriage accord between words and an essential arranging rule in the vocabulary of any language; like the link between 'blond' and 'hair' (McCarthy, 1990). Also, collocations vary significantly in volume (the amount of words included in the chain), in kind (function words collocating with content words; *look* with *at*), content words collocating with content words (*united* with *states*), in approximation of collocates (*expressed* with *opinion*), and in the scope of collocates (commit with murder, a crime, etc) (Nation, 2001).

According to Miller (1999; as cited in Nation, 2001), a main feature of knowing a word is having a mental image of a group of contexts in which a particular form can be utilized to communicate a particular sense.

1.1.5.6. Constraints on use

There are numerous aspects that restrict where and when some words can be used. Falling short to precise these can lead to wrong use. Cassidy (1972; as cited in Nation, 2001) proposes levels to get knowledge about constraints on specific words. This involves, for example: *extent* (whether international, national, regional, local, and individual), *quantity* (frequency), *register* (formal, informal, familiar), *figuration* (literal, metaphoric).

1.2. Specialized Vocabulary

We identify four types of words: high-frequency words, specialised words (including academic words and technical word), and low-frequency words. Laufer (1989; 1992) demonstrates that the minimum of text coverage to guarantee a quite good understanding of a text is 95% (Laufer, 1989-1992; cited in Paquot, 2010). To reach that coverage, it is generally considered that learners at university level are required to be competent in three categories of vocabulary: a core vocabulary of 2000 high-frequency words in addition to a few academic words and technical terms, though several investigators disagree that vocabulary lists can be expressed as if they were totally dividable (Paquot, 2010).

Specialized Vocabulary offers a good *coverage* for some types of texts.

What special vocabularies are there? They are composed by methodically limiting the extent of themes. Hence, we may give special vocabularies for speaking, for reading academic texts, for reading newspapers, for reading children's stories, and for letter writing. Technical vocabularies are specialised vocabularies too. Specialised vocabularies are put up by making frequency calculations; others are created by specialists (Nation, 2001).

As for learners of English, there is a quite significant specialised vocabulary: the Academic Word List. The words are beneficial for learners studying humanities, law, science or commerce. Academic vocabulary has at times been named sub-technical vocabulary since it does not include technical but formal vocabulary (Nation, 2001).

1.2.1. High-frequency words

There is a small set of high-frequency words which are quite essential since they involve a huge amount of existing words in spoken and written texts (Nation, 2001). Commonly, the 2000 word level has been placed as the most adequate limit of high-frequency words. Nation and Hwang (1995; as cited in Nation, 2001) prove that considering the 2000 most frequent words of English as the high-frequency words is yet the best decision. *Michael West's General Service List*, the classic list of high-frequency words, includes 2000 word families. Around 165 word families in this list are function words like *a, some, two, because,* and *to*. What remains are content words, i.e. nouns, verbs, adjectives and adverbs.

Core vocabulary or fundamental vocabulary involves high-frequency words. It consists of the most practical words (about, by, do) and content words (lesson, person, put). They have no cultural correlations, provide no hints of the domain of discourse from which the text is picked, they are used in both formal and informal discourse, and they are not limited to a particular means of interaction (i.e. used in printed or verbal language) (Paquot, 2010). Carter (1987) gives examples of core words and how we might differentiate them. If we think about the words involved in the lexical domain of 'overweight'; we have in English 'fat', 'obese', 'overweight', 'plump', etc. We would likely presume that 'fat' was the most frequent. There are core meanings for verbs too; if you ask people to use ‘break’ in a sentence, they are likely to use the core meaning of a mediator breaking a physical article such as a cup (Hatch & Brown, 1995).

1.2.2. Low-frequency Words

There is a bulk of words that are infrequent and are not much used in texts. These words are:

1-Each low-frequency word can be involved in the high-frequency list (the limit between them is a random one) as words’ order relies on the kinds of corpus on which the list is composed.

2- A large number of low-frequency words are proper names. In certain texts, like novels and

newspapers, proper names are considered as technical words. They are of high-frequency in specific texts but not in others.

3- "*one person’s technical vocabulary is another person’s low-frequent word*". What is important to some is no more than a set of low-frequency words to others. People’s vocabulary expands, to some degree as a consequence of their occupations, concerns, and specialities.

4- There are certain low-frequency words which are part of this category because they are used seldom, like ploy [trick], gibbous [humpbacked]. They may communicate a seldom idea; they may have a sense similar to a much more frequent word or phrase; or they may be pointed as out-of-date, extremely formal, part of specific accent, rude.

(Nation, 2001).

1.2.3. Academic Vocabulary

1.2.3.1. Definition

When learners have learned the 2000-3000 words of common utility in English, it is insightful to orient vocabulary learning to more focused fields. As for learners of English, there is a quite significant specialised vocabulary. This is *The Academic Word*

List. Academic vocabulary is diversely called 'generally useful scientific vocabulary', 'sub-technical vocabulary', 'semi-technical vocabulary', 'specialised non-technical lexis', 'frame words', and 'academic vocabulary'. It has been subdivided into three degrees: basic vocabulary, sub-technical vocabulary, and technical vocabulary. *The Academic Word List* contains 570 word families that are not in the most current 2000 words of English though appear a lot in a quite broad extent of academic texts; the list is not limited to a particular domain. Academic vocabulary has at times been named sub-technical vocabulary since it does not include technical but formal vocabulary. Normally it involves words such as *accumulate, achieve, compound, complex,* and *proportion* which are frequent in academic texts and not away (Nation, 2001). Academic vocabulary is a tendency, as perceived by the growing amount of textbooks on the subject. Fresh titles involve: *Mastering the Complete Academic Word List* (Huntley, 2006) and *Academic Vocabulary in Use* (McCarthy& O'Dwell, 2008) (Paquot, 2010).

Cowan (1974) defines sub-technical vocabulary as decontextualized terms which appear very often via different fields. To him, sub-technical terms relate to the same sense in various fields. Trimble (1985) enlarges Cowan's (1974) use to involve the word that have one or more 'common' English significances and which in specialized context carries out extensive significances (Trimble, 1985). Trimble's definition, hence, includes words like *junction, circuit, wage* that would be classified as technical terms in accordance with Chung and Nation's (2003) four-level ranking scale of technicality or domain particularity see table 1.2. (Paquot, 2010).

1.2.3.2. The importance of academic vocabulary for learners of English for academic goals

First, academic vocabulary is frequent in a broad scope of academic texts and not sofrequent in non-academic texts. There has been few studies evaluating the occurrence of particular academic words in academic and non-academic texts (Cowan, 1974; cited in

Nation, 2001), however, such studies has demonstrate a huge difference in frequency (Nation, 2001).

Second, academic words form a considerable number of words in academic texts. This is assessed through two means: finding the number of tokens (coverage) academic vocabulary forms; and finding the number of types, lemmas, or word families. According to Sutarsyah, Nation and Kennedy (1994), academic vocabulary (the University Word List) form 8,7% in an economic text. And according to Coxhead (1998), academic word list involves 10% of the linguistic expressions in her 35 000 000 academic word corpus and around 8,5 % in a separate corpus (Coxhead, 1998; Nation & Kennedy, 1994; cited in Nation, 2001).

Trimble (1985) proposes that the complexity with certain academic vocabulary is that it gets further significances in technical contexts, and in various technical contexts there may be several significances. For example, *fast* signifies 'to resist to in medicine', 'a hard layer weakly strengthen floor' in mining, and 'said of colours not influenced by light or heat' in paint technology.

1.2.3.3. The nature and role of academic vocabulary

The latinate nature of the academic vocabulary adds formality and learnedness to academic texts (Nation, 2001).

Learning academic vocabulary is a main concern for learners wanting to do academic study in English. Corson (1995) argues that productive use of academic vocabulary is an essential element of academic achievement. This can be encouraged through the display of planned formal discourse, critical assessment of articles, etc. Hinkel (2002) argues that the lack of academic vocabulary enhancement plays a part in a state in which foreign learners are not ready to write academic texts. Learning the 2000 high-frequency words and the *Academic Word List* will offer near to 90% coverage of the words used in the majority of academic texts. When proper nouns and technical vocabulary is added, learners will get close to the essential 95% coverage limit required for reading.

In addition, several words in academic English are frequently used with a somewhat different meaning too:

Everyday academic use	Meaning	Academic use	Meaning
Standards of <u>discipline</u> schools have declined	ability to control onself or other people	Nanotechnology is a relatively new <u>discipline</u>	area of study
<u>Underline</u> your family name	draw a line under it	The research <u>underlines</u> the importance of international trade agreements	gives emphasis to
The lake was frozen <u>solid</u>	no liquid or gaz	We have no <u>solid</u> evidence that radiation have caused the problem	Certain or safe; of a good standard

(McCarthy & O'Dell, 2008).

1.2.4. Technical Vocabulary

Technical vocabularies are essentially words that are particular to a specific branch of learning (Nation, 2001). They include words that are not really familiar in other fields or those which are part of high-frequency words, yet subject-specific (*demand, supply, cost,* are used in economics). They are normally distinguished by semantic specification, resistant to semantic alteration, and lack of precise synonyms (Mudraya, 2006). Taking a look at dictionaries of technical vocabulary, like those of geography, biology, and applied linguistics, everyone includes less than a thousand words (Nation, 2001).

And despite the fact that core words, academic words, and technical terms are depicted as if they were obviously independent, the borders between them are fuzzy (Paquot, 2010). Differentiating technical vocabulary from other vocabulary is like differentiating academic vocabulary from common words. It is to distinguish words that will be specifically effective for learners with particular aims in language use –reading academic texts in a specific field, writing technical accounts, contributing in conferences of different subject matter, and so on (Nation, 2001).

There are levels of *"technicalness"* relying on how limited a word is to a specific field. Technical vocabulary is grouped into four types:

1-The word seldom exists out of this specific area, like *pixel, modem* in computing. Hence, a person who knows these words is expected to be well-informed of that domain too.

2-The word is used in and out of this specific area though with different significance. *Excute* for example (in computing).

3-The word form is used in and out of this area, however, the majority of its uses with a specific significance, though not all, are in this area. The particular significance it has in this area is easily understandable via its significance out of the field. For example, *accused* (in law), frequency (in Applied Linguistics), memory, window (in computing).

4-The word form is more familiar in this area than away. There is a slight or no particularity of significance, still a person well-informed in the area would have a more exact concept of its significance. Like *judge* (in law), *print* (in computing), and *word, meaning* (in Applied Linguistics).

(Nation, 2001).

Words in 3 and 4 types are slightly clearly technical as they are exclusive neither in form or significance to a specific domain. The words, specifically in type 4, are easily available via their use out of the domain. A glimpse at a list of type 4 words is enough to rapidly distinguish the domain being used (Nation, 2001).

Category 2 and 3 show that an extent builds up only on form is not enough to differentiate technical words from non-technical ones. The gradual change from category 2 to 4 brings up the inquiry of whether a technical word requires having a technical significance, i. e. a sense dissimilar from its utilization out of a specific domain, and hence how dissimilar the significance should be (Nation, 2000).

The above levels of technicalness goes with the categorization of Chung and Nation (2003) who study the kind of words that constitute technical vocabulary in texts of Anatomy and Applied Linguistics. They categorize technical items on a four-degree scale made to evaluate the power of connection between a word and a specific domain (Paquot, 2010).

Table 3: Chung and Nation's (2003) rating scale for finding technical terms, as applied to the field of anatomy

Step 1
Words such as function words that have a meaning that has no particular relationship with the field of anatomy, that is, words independent of the subject matter. Examples are: *the, is, between, it, by, adjacent, amounts, common, commonly, directly, constantly, early* and *especially.*

Step 2
Words that have a meaning that is minimally related to the field of anatomy in that they describe the positions, movements, or features of the body. Examples are: *superior, part, forms, pairs, structures, surrounds, supports, associated, lodges [accoodates], protects.*

Step 3
Words that have a meaning that is closely related to the field of anatomy. They refer to parts, structures and functions of the body, such as the regions of the body and systems of the body. Such words are also used in general language. The words may have some restrictions of usage depending on the subject field. Examples are: *chest, trunk, neck, abdomen, ribs, breast, cage, cavity, shoulder, skin, muscles, wall, heart, lungs, organs, liver, bony, abdominal, breathing.* Words in this category may be technical terms in a specific field likeanatomy and yet may occur with the same meaning in other fields where they are not technical terms.

Step 4
Words that have a specific meaning to the field of anatomy and are not likely to be used in general language. They refer to structures and functions of the body. These words have clear restrictions of usage depending on the subject field. Examples are: *thorax, sternum,*

costal, vertebrae, pectoral, fascia, trachea, mammary, periosteum, hematopoietic, pectoralis, viscera, intervertebral, demifacets, pedicle.

(Chung & Nation, 2003).

Cohen et al. (1988; as cited in Paquot, 2010) view the enlarged significances of what they named 'non-technical' terms as a difficult side for non-native readers who may just be conscious of one of their significances. In Biology, for example, the adjective *specific* may refer to the genetic concept of specificity, which is a feature of *enzymes*.

In Li and Pemberton's vision (1994; as cited in Paquot, 2010), sub-technical vocabulary as defined by Trimple (1995) is a crucial sub-list of academic vocabulary. They point out that first year computer science learners are more capable of distinguishing the technical meanings of sub-technical words than their non-technical meanings. For example, they are more familiar with the verb *to compile* in computing and are likely to understand it as *to translate* (for instance), despite its context. This is problematic since the non-technical sense of a sub-technical word is frequently more familiar than its technical sense.

Martin (1976) uses the term academic vocabulary as a synonym for sub-technical vocabulary to indicate words that share a focal on research, analysis, and assessment – those tasks which describe academic work. The vocabulary of the research process contains mainly verbs, nouns and their co-occurrences (e.g. *state the hypothesis and expectedresults*). The vocabulary of analysis involves high-frequency verbs and two-word verbs that are often ignored in teaching English to foreign students but which arrange students requirement in order to submit information in a systematic way, e.g. *consist of, group, result from, derive, bring about, cause, base on, be noted for*. Adjectives and adverbs make up a largeproportion of the vocabulary of evaluation.

Various definitions of sub-technical vocabulary involve so different lists of lexical items. Sub-technical vocabulary is usually defined as a recurrent group of words in the different disciplines and make up an important amount of word tokens in academic texts. Moreover, definition of sub-technical vocabulary vary broadly, indicating words that hold enlarged significances in particular academic fields, or to words that permit researchers to carry out research, analysis facts, and assess outcomes (Paquot, 2010). Baker (1988) used the term as a language type for different kinds of lexical lists involving Trimble's (1985) sub-technical vocabulary and Martin's (1976) academic vocabulary.

Baker (1988) claims that this zone between core and technical vocabulary consists itself of many kinds of vocabulary:

1. Items which communicate ideas shared by all or many specialized fields. Examples involve *factor, method* and *function*.

2. Items with a specialized meaning in a specific domain and a different meaning in general language (e.g. *bug* in computer science, *solution* in mathematics and chemistry).

3. Items which are not utilized in general language though have different technical meanings in various fields (e.g. *morphological* in linguistics, *botany* and biology).

4. General language items having constrained meanings in one or more fields. In botany, ‘genes which are *expressed* have perceptible effects, i.e. are more visible physically, Contrary to being *masked*.*Expressed* in botany is not related with emotional or verbal behaviour as is the situation in general language’.

5. General language items which are utilized, in favour of other semantically synonymous items, to illustrate or comment on technical processes and roles. For example, a study of biology textbooks proved that photosynthesis does not *happen* but *takes place* or occasionally *occurs*. Baker thus comments that *take place* and *occur* can be regarded as sub-technical words.

6. Items which are utilized in academic texts to carry out particular rhetorical roles. There are ‘items which indicate the writer’s aims or his assessment of the tools given’.

Various studies have been based on frequency or scope to characterize technical vocabulary. Becka (1972) determines three types of words in specialised discourse: Grammatical/ function words (containing words that are not nouns, verbs, adjectives, and adverbs like of, she, but) with 176 word families, and two types of lexical words: non-terminological words and terminological words (called also terminology or technical terms) whose meaning requires scientific knowledge . To use them well, we must learn the relevant science. And for the reason that they have specific significance, they are usually of average to low-frequency in texts and more significantly have a very restricted scope. They just appear in a small number of texts and fields (Nation, 2001).

1.2.4. Teaching Specialized Vocabulary

What should teachers and learners do about specialised vocabulary? Specialised vocabulary should be dealt with like high-frequency vocabulary, i.e. it should be taught using different methods. Learners should be aided to notice the similarities and dissimilarities between the high frequency senses and the technical employment. For example, what is the likeness between a cell *wall* and other fewer applications of *wall*? A lot of technical vocabulary is meaningful just in the situation of learning the specialised field of study (Nation, 2001). As for Flowerdew (1992), he claims that definitions in science lectures to non-native speakers happen methodically. This implies that knowing the technical vocabulary is strongly associated with knowing the domain. Moreover, Godman and Payne (1981) argued that a technical term is merely meaningful when other associated terms are known too, i.e. knowing a technical term encompasses having the knowledge that is related to.

From the learners' viewpoint, unfamiliar technical words usually cannot be neglected when reading as they are strongly related to issues being examined, especially they are hard to guess from context in case the reader does not have a good background in that technical field. That is why searching the word in the dictionary is not useful (Nation, 2000).

Conclusion

L2 vocabulary learning was considered to be marginalized; it is until the 1970s did vocabulary receive significant attention and was treated as one of the most important aspects of L2 learning. Moreover, it seems that vocabulary is one of the most challenging factors that learners would face during the process of second language acquisition; vocabulary knowledge is not restricted to just learning single words, it is an incremental and unending process, related to depth (how well a word is known) besides breadth (size), different type of lexicons (there are words used in specific areas), etc.

Chapter II

Second Language Vocabulary Acquisition

Introduction

The study of the SLA has increasingly aroused the interest of linguists and psycholinguists around the world. The way the information is organized in the mental lexicon is a key issue; the large number of words in the mental lexicon and the high speed of word-retrieval indicate that the mental lexicon must be highly well-organized in human beings' minds (there are two opposing views: one of phonological organization and the other is of semantic organization). Marshen-Wilson (1989) talked about the importance of the lexicon in language understanding. This centrality is correct for both first and second language acquisition, according to Caroll (1992). He mentioned the recent shift to the scrutiny of the nature of the cognitive processes required for understanding or using the language.

Hence, a major question of SLA has to do with the nature of the L2 mental dictionary. while research on the structure and organization of L1 is well improved, such organization is debatable when more than one language is engaged. Hence, other main questions about SLA are related to how L2 lexical items are stored and learned, and the different means involved for that ultimate goal.

So, how the vocabulary, learned, of L2 is related to L1? do they share incorporated store systems?, and if not, are they likely or differently arranged in the lexical store?. In this sense, how does L1 contribute to SLA?; and what other principles of learning/ teaching are involved in SLA?. These are the main questions addressed in the second chapter, of this paper, related to SLA.

2.1. Optimal Condition for L2 Vocabulary Acquisition

Proof from Pearson and Fernandez (2004) proposes that the amount of speech listened to, exposure to a large vocabulary involving a few low-frequency lexical items, and reading, predict effective lexical acquisition for both bilingual and monolingual children (Wagner, Muse, & Tannenbau, 2007). Craik and Lockhart's (1972; as cited in Schmitt, 2010) *Depth/ Levels of Processing Hypothesis* explain that the more attention is given to an item, the better it will be memorized (Schmitt, 2010). Schmitt (2008) use the term engagement to embrace all of the previous involvement options, he said: *"...anything that leads to more and better engagement should improve vocabulary learning..." (pp. 339-40).*

In addition to that, one of the theories claiming that there is a period when language acquisition occurs naturally and easily is *the critical period hypothesis.* Penfield and Roberts (1959) argue that the best age for language acquisition takes place within the first ten years of life. During this period the brain maintains plasticity (flexibility) that fades at puberty. They proposed that this was the result of the lateralization of the language role in the left hemisphere of the brain. I. e., the neurological ability of the brain for understanding and using language, which primarily includes the two hemispheres of the brain, is gradually centred in the left hemisphere (Penfield & Roberts, 1959; cited in Ellis, 1985). Lenneberg (1967; as cited in Ellis, 1985) sustains the critical period hypothesis. He claims, after scrutiny, that damage in the right hemisphere produces more language difficulties in children rather than adults. Moreover, he reached the point that in situations where children went through surgery of the left hemisphere, no speech problems appeared, while nearly an overall language failure happened to adults.

However, adults show a parallel developmental route in SLA. Hence, that the rules of Universal Grammar are yet useful to the adult and are appropriate to SLA. Wode (1984) presumes that there is no more than one mechanism to learn languages (Ellis, 1985).

2.2. Linguistic Features of Lexical Items (Interlexical Aspects)

Pronounceability (that has to do with English sound system), orthography (right spelling of the word), length, morphology (a word will be harder to learn if it has a difficult *morphology*, like infrequency of plural form), synformy (learners confound words that seem to be similar), grammar, and semantic features of the word (that involve abstractness, register limitation, idiomaticity and diversity of meaning/ polysemy) are all factors involved in word learning (Yu, 2011).

Moreover, the more the L1 and L2 are alike the easier the acquisition; the orthography is easier if L1 and L2 use the same orthographic features (English *hand*; German *hand*) and are read likewise (e.g. left to right). In addition, the nearer the connection between graphemes and phonemes (sound-symbol connection), the simpler is to learn (Schmitt, 2000)

2.3. Recognizing the Importance of the L1 in Vocabulary Studies (Intralexical Aspects)

For learners studying an L2 throughout junior high-school, senior high-school, and university, the size of L1 and L2 lexicons connect strongly. In terms of learner production, Hemchua and Schmitt (2006) examined the lexical errors in Thai-university EFL writing, and concluded that almost one-quarter were estimated to be referred to L1 effect. However, may be the best proof for L1 effect originates in psycholinguistic researches, which shows that the L1 is functioning in the course of L2 lexical processing in initiative and more progressed level of learning (Hemchua & Schmitt, 2006; cited in Schmitt, 2010).

Swan (1997) considers that *"the mother tongue can influence the way second language vocabulary is learn...the way it is recalled for use" (p. 179).* For example, words which pursue the orthographic/ phonologic systematicity of the L1 will usually be easier. It has been hypothesized that the primary form-meaning connection involves the novel L2 word form being connected with a representation of the parallel L1 word that is previously present in memory (Schmitt, 2010).

2.4. L1 and L2 Lexical Development: a Preliminary Assessment of Similarities and Contrasts

Rosansky (1975) claims that cognitive development explains the major simplicity with which young children learn languages. She considers that progress in L2 may occur in two different means. The young child notices nothing more than resemblance, in short of elastic thinking, and is egocentric. These are the requirements of unconscious language acquisition, as it is related to a lack of metacognition (the young child ignores that he is acquiring a language). On the contrary, the adult cannot learn a L2 mechanically and instinctively. The abstract thinking that starts at about the age of twelve with the (Piaget's) last phase of cognitive development (Formal Operation), indicates that the learner is prepared to distinguish differences and resemblance, and to turn out to be less centred. So, he developed a solid metacognition (Ellis, 1985). This obliges the learner to deal with the acquisition, as Rosansky (1975) says, as a "*problem to be solved using his hypothetico-deductive logic"* (p. 98). The problem with Rosansky's claims and neurological justifications is that the two are founded on the presumption that post-puberty learners are not as much effective and successful as younger learners. Hence, it is probable that cognitive development is a feature; it can aid demonstrating that the metacognition that appears with Formal Operations may ease more effective learning (Ellis, 1985).

Learners are backed up by inborn systems, yet for among those who adopt a Universal Grammar outlook of language acquisition, there are, a lot tending to consider that inborn systems die away further than a specific age (as explained earlier) (Singleton, 1999).

The two main dissimilarities between the L1 and L2 learner is that the latter has previously gone through the process of acquisition, yet still, there are elements of links between the L1 and the L2 incident (Singleton, 1999).

In the phonemic domain, the proportional effectiveness of phonological working memory is essential in setting the speed of L2 lexical enhancement as it is in setting speed of L1 lexical enhancement (Singleton, 1999).

Paradis (2004), as Chomsky, presumes no significant dissimilarity between bilingualism and monolingualism (Kristen, 2009, The Neurolinguistics of Bilingualism section); for him, a bilingual has *"two subsets of neural connectors, one for each language, within the same cognitive system" (p. 110).*

Wagner,Muse, and Tennenbaum(2007)consider that there exists a positive correlation between L1 and L2 language skills of all kinds, involving vocabulary. If vocabulary acquisition is thought of as having two elements, learning new concepts and learning new phonological forms, then obviously an [adult] L2 only required to learn new forms in the L2. Hence, if there is an L1-L2 correlation, this reveals a mechanism of transfer of concept from the L1 to the L2. At last, it appears to be logical that having a huge amount of L1 vocabulary produces certain metalinguistic progression that direct towards a bigger easiness in L2 vocabulary acquisition, for example, huge vocabulary size guides to better understanding about polysemy and about morphological analysis, and provides a better knowledge ground that could be used in case cross-linguistic cognate relationships exist.

2.5. The Role of the First Language in SLA

Till the 1960s, it was presumed that the learners' L1 knowledge would interfere with the L2 where there were differences, and would help learning the L2 in case of similarities between both languages; this is named: *language transfer* (Ellis, 1985).

2.5.1. The Contrastive Analysis Hypothesis

A process based on the idea that comparing the learner's L1 and L2, to determine the difference between the two languages, was made to recognize the difficulties L2 learners would be confronted with. And hence, offering it much focus in teaching. In the 1960s, the Contrastive Analysis undergoes practical scrutiny. The results of researchers like Dulay and Burt (1973, 1974) bring up uncertainty about negative transfer as a major factor in the process of SLA. Several grammatical errors could not be justified by L1 interference. Consequently, Contrastive Analysis turns out to be out of date (Ellis, 1985).

2.5.2. The Universal Hypothesis

Chomsky's (1959; as cited in Ellis, 1985) criticism of Skinner's theory of language learning showed the way to a reaffirmation of mentalist viewpoints of first Language acquisition (FLA) in place of the approach of behaviourists. Chomsky draws to the effective involvement of the child. He stated that the child's knowledge of his mother tongue was brought from a *Universal Grammar* which stated the necessary formula that any natural language could use. The Universal Grammar, therefore, is a group of internal linguistic rules which consisted of the 'primary condition' which dominated the shape of sentences in any language. Moreover, one of its components was a group of processes for associating the universal rules with the facts offered by exposure to a natural language.

Cook (1985; as cited in Ellis, 1985), in a clear explanation of the Chomskyan viewpoint of Universal grammar, writes that it is the internal assets that form Universal Grammar which involves general rules relevant to any language.

2.5.2.1. Linguistic Universals and L1 acquisition

The correlation between linguistic universals and L1 acquisition has been investigated in relation to Universal Grammar. The correlation between the two is an essential one, as Chomsky's explanation of Universal Grammar as it offers the single way to justify how children are capable of learning their mother tongue. Hence, there are biologically fixed elements that prevent the child from forming wrong hypothesis (Ellis, 1985).

2.5.2.2. Linguistic Universals and SLA

The data on hand proposes that age does not change the course of acquisition. Cazden et al. (1975; as cited in Ellis, 1985) conclude that learners of all ages went through the equivalent phases. Hence, learners process linguistic information likewise no matter of their age.

Rate and success of SLA seem to be very effected by the age of the learner. Snow and Hoefnagel-Hohle (1987) demonstrate, in their investigation on Dutch L2 learners, that even if age develops language learning ability, performance may climax in the teens, after which performance drops (Hoefnagel-Hohle, 1987; cited in Ellis, 1985).

Regarding success of SLA, Burstall (1975) found that the more prolonged the exposure to the L2, the better proficiency is attained in L2 (i.e. the closer to that of natives): *"the achievement of skill in a foreign language is primarily a function of the amount of time spent studying that language..." (p. 17).*Brustall (1975) proved that, through time, the effect of the age of the learner starts to exceed the duration of learning, mainly in receptive skills. Ekstrand (1975) demonstrates that the duration of stay of immigrants learning Swedish in Sweden associated to absolute verbal production, yet to not other proficiency elements. For Hatch (1983), it would seem that even if years of exposure to the L2 results in more success, this may be limited to general communicative capacity instead of grammatical and or phonological correctness (Brustall, 1975; Ekstrand, 1975; Hatch, 1983; cited in Ellis, 1985).

The majority of studies have examined the correlation between measures of age (time spent in learning) and degree of proficiency attained. The general conclusion is that the more prolonged the exposure to the L2, the more competence shows in L2. Yet, there have been researches that have reflected on whether the 'natural' route changes with age of the learner (Ellis, 1985).

2.5.2.3. Linguistic Universals in Interlanguage Development

Chomsky (1959) claims, as seen before, that universal grammar interrelates with other abilities in charge of channel ability (rate of transmitting information) in L1 acquisition. But in SLA, it is not obvious whether the learner is prone to parallel maturational limitations like the child (Chomsky, 1959; cited in Ellis, 1985). Gass and Ard (1980) propose that while cognitive and comprehension improvement influences the young child's cognitive capacities, this is the situation for the adult learning a L2. So, SLA might bedescribed as 'cognition minus maturation', as it mirrors Universal Grammar in its natural shape (Gass & Ard, 1980; cited in Ellis, 1985).

The supposition that cognitive processes are not included in SLA, though, may not be proved to be right. Channel ability shows to have a role in certain features of SLA. For example, despite the fact that L2 learners show an ability to produce somewhat long statements just from the start of SLA, they are yet possibly to turn to simple semantics, mainly in casual chat. Ellis (1985) proposes that L1 and L2 learners produce parallel types of statements in the initial phases of development; the statements of the two types are short. Cook (1975) gives further proof that speech processing memory functions in SLA and in L1 acquisition in related clauses, and those general linguistic rules are valid just when the learner attained a particular developmental point. Cook (1985) remarks that what is needed is to find out which cognitive processes require to be reformed in a second language and which transmitted (Cook, 1975; Cook, 1985; cited in Ellis, 1985).

2.6. Semantic Transfer and Development in Adult L2 Vocabulary Acquisition

Different from L1 acquisition, lexical growth in L2 does not automatically require huge semantic growth. Adult L2 learners usually depend on prior semantic framework in order to use L2 words properly (Bogaards & Laufer, 2004).

L2 vocabulary acquisition involves two dimensions**:** the first involves the lexical login in the mental lexicon (retention, consolidation, and automatization of words in the lexicon). Examples of these processes are the primary recording of a word in one's memory, the consolidation or loss of a word (a role of the learning strategies used and frequency of use and practice), and the incorporation of lexical knowledge into one's automatic proficiency (associated with size or breadth) (Bogaards & Laufer, 2004).

The other dimension is mainly related to the content of a lexical entry (all information in the mental lexicon about an item). It includes processes by which a learner turns out to be more knowledgeable about a word (demonstrated in the proper use of a word). Semantically, it can refer to a more exact understanding of a word's significance, betterknowledge of the semantic differenences between an L2 word and its L1 translationor of the link between an L2 word and other L2 words, to knowing peripheral, figurative, and connotational significances. This dimension involves much of what has been called depth or richness. The latter is implicated in this dimension since the way the L2 lexicon is arranged, or how L2 words are connected to one another depends largely on what is represented in the lexical entry (Bogaards & Laufer, 2004).

2.7. Separation/ Integration between the L1 and the L2 Mental Lexicon

There are two viewpoints that entail that in the situation of post-pubertal L2 learner, L1 and L2 lexical processes are separate (Singleton, 1999).

2.7.1. Bilingualism research:

Cook (1992, 1993; as cited in Singleton, 1999) mentions a large extent of proof from bilingualisms study carried out over the past 25 years. There is huge proof about the issue that supports the matter of the separation/ integration of mental lexicon. It involves the following results:

-While processing an intralingual homograph (like French/ English *coin),* bilinguals get into its significances in their languages not only the significance particular to the language being used;

-Bilinguals check the lexical stores linked to the two languages when having vocabulary tests in one of their languages

Jessner (1996; as cited in Singleton, 1999) mentions positively Cook's hypothesis and the proof he quoted, and she gives evidence in relation with a full outlook of bilingualism/ multilingualism:

-the influence of bilingualism/ multilingualism with regard to improvements in cognitive pattern;

- The link between bilingualism/ multilingualism and creative supple, different thinking through a person's linguistic chain

Nevertheless, not the whole proof from bilingualism studies prefers the integrationist outlook. One clear point is that bilinguals use one language at once (Singleton, 1999).

2.7.2. Research into the Role of Cross-Linguisitic Influence

It seems that in the acquisition of novel L2 lexical items, struggles usually come up between cross-linguistic semantic-associative processing and form-oriented processing having the objective of forming a copy of the novel word. The learner has the activity of solving this struggle testing out the different hypotheses. For example, Giacobbe's (1993-94; as cited in Singleton, 1999) Spanish-speaking female participant acquiring French linked the French word *cuisine* ('kitchen') with the Spanish word for 'kitchen'- cocina- making forms like [kosin] and [kosi], and trying, on the other hand, to imitate the French form, making forms like [kusin] and [kwisin] (see alsoGacobbe and Cammarota, 1986).

Basically, cross-linguistic proof re-examined earlier demonstrates that the intralingual aspects of lexical processes are semantic and formal, and hence sustains the outlook that meaning is crucial to the working of the L2 mental lexicon. Hence, proof has to do with maintaining:

-that word-connection test information does not succeed to permit a foremost ‘phonological’ notion of the L2 mental lexicon in opposition with a foremost ‘semantic’ notion of the L1 mental lexicon;

- With regard to the constructing of L2 lexical memory codes, there is a meaning-focused dimension to even the initial phases of this process;

- and that context-based L2 lexical processing and learning has both formal and semantic-pragmatic elements

(Singleton, 1999).

2.8. The Incremental Nature of Vocabulary

According to Melka (1997), Knowledge of an L2 lexical item involves many constituents: phonological, orthographic, morphological, syntactic and semantic, and knowledge of conceptual basis that control the place of the lexical item in our conceptual system. At last, it unavoidably involves the capacity of productive use, i.e. efficient recall of the lexical item for active use. Still, knowledge of the lexical item is not an ‘all-or-nothing’, instead it is a continuum of knowledge at whose edges the receptive and productive knowledge is put. The primary level is basic knowledge, like the visual distinction of a lexical item in a context. Higher levels of knowledge, near to productive knowledge, would propose, for example, knowledge of polysemy (multiple meanings) of lexical item or its collocations, etc (Melka, 1997; cited in Takac, 2008).

Taking into account the incremental acquisition of L2 single lexical items, it is well-known that single lexical items require to be encountered several times for the purpose of being learned. Moreover, lexical knowledge is formed of different types of word knowledge (form, meaning, and use) and can not entirely be learned from one exposure. In addition, every word knowledge feature may improve alongside a continuum, i.e. not just is word learning incremental, yet learning of the single word knowledge features is too. Spelling, for example may go from zero fractional exact enhancement; spelling can act as follows:

can't spell word at all	knows some letters	phonologically correct	fully correct spelling

All together, this shows that learning is a difficult yet progressive process (Schmitt, 2010).

2.9. Cognitive Perspective on L2 Vocabulary Learning

According to Ellis (1995),in comparison with linguistic L2 acquisition theories, which see linguistic knowledge as exclusive and independent from other knowledge frameworks, acognitive theory of L2 acquisition, basedon the theory of processing, thinks of this latter as being guided by the same rules as other kinds of learning, yet perhaps more intricate in nature. Emphasis is placed on 'meaningful learning', i.e. learning with understanding which is not manifested in behaviour (Takac, 2008), but which can be described by Ausubel (1967) *as "...conscious experience that emerges when potentially meaningful signs, symbols, concepts...are related to and incorporated within a given individual's cognitive structure"(p. 10).* In this sense, meaningful learning is opposed to rote learning that is based on repetition.

Ellis (2000) claimed thatthe cognitive theory describes L2 acquisition as an intricate cognitive skill which, like other similar skills, involves cognitive systems (like perception, memory, and information processing.As for Nation and Gy (2007), vocabulary learning needs memory, processing, storing, and using L2 words (output). Repetition and use are two means to make retrieval easy (Baddeley, 1997). This latter is explained in the following:

2.9.1. Memory and its Mechanisms

Memory has to do with the cognitive processes of storing information for soon recalling and use (Yu, 2011). Atkinson and Shiffrin (1968; as cited in Yu, 2011) primarily suggest a methodical and comprehensive information processing pattern –that pattern involves a three-levels processing pattern of memory: sensory memory, STM, LTM, as illustrated next:

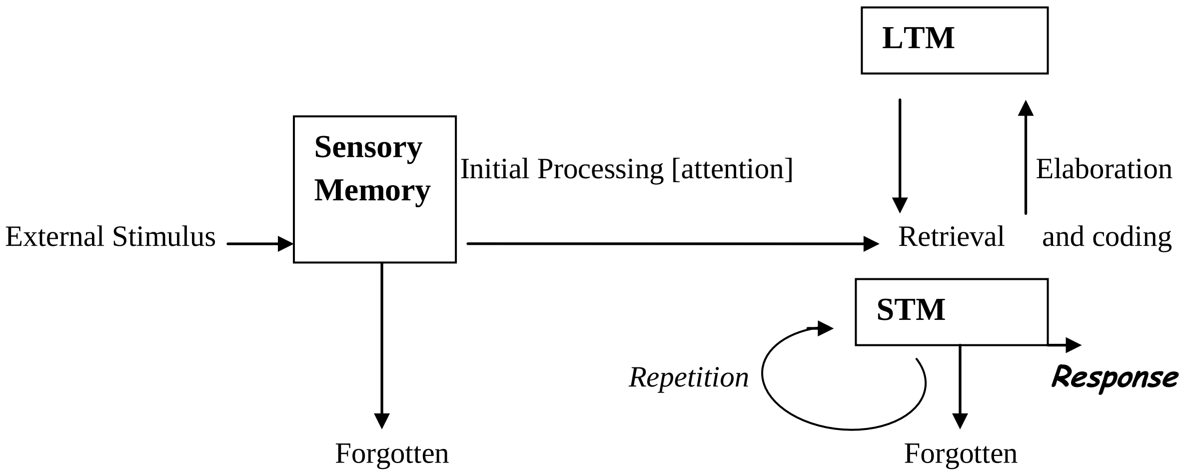


Figure 3: Stage Model of Information Processing Based on the Work of Atkinson and Shiffrin (1968) (this figure was adapted by Huitt (2003)

The process of information getting into the STM is named "working memory" (Baddeley, 1999). Despite the fact that forgetting could occur in whatever phase of memory (even when it comes into LTM), there are several means to simplify the retention of knowledge; repetition, retrieval, elaboration, and encoding (as demonstrated in figure1) (Yu, 2011).

The cognitive theory sees memory as functioning in two stages. The first is the working or STM system characterised by limited capacity. This means that short-term memory requires conscious effort and control to retain only modest amounts of information. The second stage of storing information is the LTM system which is large in capacity and is not susceptible to conscious control. Material is transferred from one system to another by means of repetition in the working memory system, which also contains a central executive component whose task is to direct a limited amount of attention. The working memory also holds ‘records’ from long-term memory that are in the state of ‘high activation’ and that interact with new information. The working memory system assumes an important role during intake and speech production. During intake, the working memory has to distinguish what is relevant for comprehension, and in speech production it serves as ‘storage’ for storing various elements that are retrieved from long-term memory for the purposes of composing a message (Takac, 2008). The process of new information acquisition, as O’Malley and Chamot (1996) conclude -citing Weinstein and Mayer (1986) - is a four stage encoding process involving selection, acquisition, construction and integration. In the first stage, selection, learners focus their interest on specific information which they transfer first into the working memory and then, in the acquisition stage, into the long-term memory for permanent storage. In the third stage, learners actively build internal connections between ideas in the working memory and the long-term memory by making use of related information. In the final stage, integration, learners look for prior knowledge in the long-term memory and transfer this knowledge into the active memory.

According to Loftus (1976; as cited in Yu, 2011), in order to demonstrate the link between retention and memory, the concept of retention interval is needed. Loftus (1976) defines retention interval as the period of time between the meeting of the word and the subsequent rehearsal. A retention interval can be longer than four seconds, yet if one word is retrieved after a longer interval (more than 15 seconds), it is more likely to get into LTM.

To a certain degree, the definition of rehearsal and that of repetition are alike. There are two types of rehearsal according to psychologists; the first, maintenance rehearsal, has to do with memorizing information without any type of encoding (like rote repetition), and it is presumed to stop forgetting, yet that information will not permit LT learning (Baddeley, 1999). The second type is elaborative rehearsal that includes profound semantic processing. It is more probable to result in LTM. In addition, elaborative rehearsal is an intricate process. Learners must link prior knowledge with new knowledge during that process (Sousa, 2006). Craik and Lockhart (1972; as cited in Baddeley, 1999) state that the more profound the processing, the longer the memorization.

Sperling (1967; as cited in Yu, 2011) provides a model of ST retention to illustrate the link between STM and rehearsal. The visual input get immediately into the iconic store [sensory memory relating to the visual field], and, after that get into Scanner which includes attention and identification. Rehearsal is the following constituent of this pattern. Rehearsal will aid the information to get into the LT store, thus it is an essential element of the ST storage.

The processing theory has given proof to sustain the presumption that ‘knowing’ something is simpler than retrieving it, i.e. it is easier to know words by learning word lists, yet when one is requested to retrieve it, more profound processing is needed (Yu, 2011).

Advocates of the depth of processing hypothesis contend that the different means in which input is processed will enhance different levels of memory: more profound cognitive processing will lead to more profound memory effect. Different memories rely on the different levels of processing. Tasks, like analysis, arrangement, and identification of meaning are viewed as more profound processing, the ‘shallow’ level of processing involving the identification of stimuli via perceptual analysis, usually enhances STM (Yu, 2011).

Knowledge without whichever profound processing, e.g. learning words from lists, will be simply forgotten. Advocates of the depth of processing model for language learning contend that the profundity of processing that occurs will influence the permanence of memory effect. Craik and Tulving (1975; as cited in Yu, 2011) suggest that memorization has an intimate connection with encoding: the more significant the encoding, the better the knowledge will be memorized. Many researches (e.g. Sokmen, 1997; Laufer & Hulstijn 2001; Folse 2004; Lefrancois 2006; cited in Yu, 2011) have shown that the more profound the processing, the better the learning. Moreover, Thornbury (2002) contends that the more cognitive effort is needed when one learn a novel word, the better the word is memorized.

2.9.2. The Role of Memory in Vocabulary Learning and Acquisition

When getting new information, the majority of it is forgotten right away, after which the process of forgetting decelerate. Thornbury (2002) gathered a list of rules that ease the transmission of information into LTM. These involve several times of coming across a lexical item, if possible at spaced periods, recall and use of a lexical items, cognitive depth (getting brain working; from comprehension to using, analyzing, evaluating, creating), affective depth (making it personal in some ways, getting the students to relate the language to their own life), imaging, use of mnemonics and conscious attention that is essential to recall a lexical item. According to Schmitt (2000), an appropriate comprehension of the function of memory in vocabulary acquisition has a direct practical worth as lexical knowledge is more prone to attrition (forgetting a word because of the absence of practice of the language) than other linguistic elements (Schmitt, 2000; Thornbury, 2002; as cited in Takac, 2008).

2.9.2.1.Vocabulary Attrition and Long-Term Retention

Vocabualry acquisition is not a neat longitudinal issue, without revision, learners forget data too. This forgetting (attrition) is natural in learning that may take place even in case vocabulary is quitefamiliar, such as when one does not use a language for a long time. Generally, lexical knowledge appears to be more inclined to attrition than other linguistic features, like grammar and phonology. This is for the reason that vocabulary is formed of single units instead of a continuum of principles. It seems that receptive vocabulary does not attrite noticeably and when it happens, it is regularly marginal words non cognates. However, there is some proof that the speed of attrition is related to competence degree, with learners with huge vocabularies maintaining more remaining information of their vocabulary (Schmitt, 2010). Generally, when vocabulary is learnt, it does not seem to totally get lost; Bahrick (1984; as cited in Schmitt, 2010) claims that vocabulary knowledge remained in his candidates even 50 years later of language use. Hence, it would be better to consider attrition in relation with being unable to have access, instead of in relation with a total exclusion of lexical knowledge.

2.9.2.2. Lexical Memory Research

The importance of meaning in dealing with L2 lexis is highlighted by the place of phonological STM in L2 lexical acquisition (e.g. Baddley et al, 1988; Ellis & Beaton, 1995; Papagno et al., 1991; Service, 1989, 1992, 1993-94; Service & Craik, 1993; Service & Koboee, 1995; cited in Singleton, 1999).

First, a usual definition of STM by Evans (1978) was:

> *"the capacity of the brain to hold information in a kind of immediate access store for a short period after it has been presented" (p. 334, cited in* Singleton, 1999, p. 148*).*

Several psycholinguists and psychologists studying language use the term working memory or speech-processing memory to talk about the short-term phonological store in which the process of arranging the speech's phonological representation into elements and distinguishing their content and role is focused on (Singleton, 1999).

Second, L2 researches which have scrutinized the function of short term phonological representations (of L2 lexical items) have tackled new uncommon L2 words -items, in other words, items which had not had any chance to become 'linked up' with participants' internalized semantic schemas. These are exactly the conditions in which one would wait for the effective encoding of the real form of a word to be of major significance (Singleton, 1999). It is crucial to mention in this context that Brown and Payne's (1994) scrutiny via questionnaire of L2 vocabulary learning strategies -summed up by Hatch and Brown (1995)- generates a pattern of vocabulary learning founded on five crucial stages in which attention to form comes before attention to meaning. The five stages are: 1) getting into sources of new words, 2) reaching an obvious aural/ visual picture of the form of the novel word, 3) learning the meaning of the novel item, 4) making powerful link between form and meaning of the novel word, and 5) using the novel word.

Third, according to certain studies, the semantic factor exists even in the initial phases of learning L2 lexis. In one of the researches, Service (1993, 1993-94) and Service and Craik (1993) get that her participants' ability to learn new items considerably connect not just with recurrence of foreign words yet with performance in the activity of learning couples of common L1 words too -an activity essentially semantically centred. From this dual connection, she deduced that L2 vocabulary learning relies on the making of phonological as well as semantic representations in working memory, and on building correlations between the representations in LTM (Service, 1993, 1993-94; Service & Craik, 1993; cited in Singleton, 1999). Nation (1990) states too, that a huge number of words, at the first phases of language learning, are learned right away as separate twosome that involve a word from the target language (a synonym) or a translation in the mother tongue, and that, with enough repetition, they are stored. A study by Crothers and Suppes (1967) shows that 7 repetitions were enough for learners to master 108 new Russian-English word couples, and that 80% of a more than 216 word couples were learned by the majority of the control group of learners just after 6 repetitions. Although the research left questions not answered about word difficulty, kinds of repetition, if the learning directs mainly to passive or active knowledge, length of repetition, etc; it shows that amounts of main vocabulary can be learned effectively and rapidly and by methods of rote learning which are not thought of as significant all the time (Crothers & Suppes, 1967; cited in Carter, 1998).

Generally, the previous studies strengthen the outlook that the process of the L2 mental lexicon is similar to that of L1 mental lexicon, and that the phonological factor is significant in the initial phases of treating specific item in L1 and L2 mutually. A research of Hulme, Maughan, and Brown (1991; as cited in Singleton, 1999) about the role of LTM in STM span confirms the top reading proof. Hulme at al. (1991) describes LTM as: *"...permanent memory representation...that is not synonymous with STM" (p. 688).* While memory span, as stated by Evans (1978), is commonly: *"the maximum number of items that an individual can recall after they have been presented to him once" (p. 212, cited in Singleton, 1999, p.151).*

Ellis (e.g. 1994, 1995; as cited in Singleton, 1999) claims that there is a total disconnection between the semantic and the formalfeatures of vocabulary acquisition, stating that the latter is implicit and unconscious while the former (semantic) is conscious explicit learning. Ellis (1997) thinks that learning, primarily, involves an implicit alteration in the orthographic/ phonological systematicity that is part of whichever language system. For example, in English the consonant group *sch* can initiate the word school, yet *hsc* cannot. Initial conscious learning (if any) lately turns out to be unconscious, with the rapidity and global competency of orthographic input (reading) and output (spelling) systems essentially acquired by repetition (in using the target language) (Schmitt, 2000).

2.9.3. The L2 Mental Lexicon

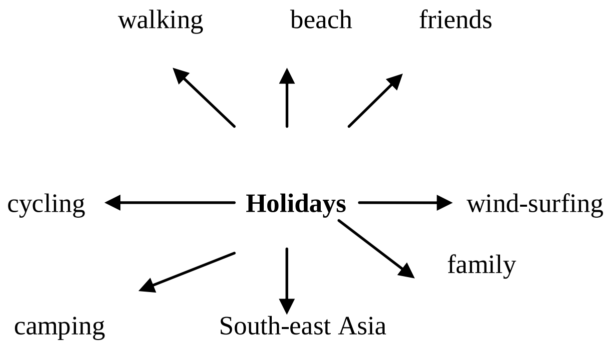
2.9.3.1. How the Mind Organizes Vocabulary

In our mother tongue, we are capable of storing, retrieving, and using huge amount of words, but how all that happen rapidly? What processes are involved and are they similar in L1 and L2? (McCarthy, O'keeffe, & Walsh, 2010).

Searching words in the mind, or our mental lexicon, we can use observations of how language is used as a method to understand how words are stored and retrieved. Using the computer analogy, we can say that a lot relies on memory size and processor pace. However, it also relies on how we record, store and retrieve information. Moreover, we must not presume that the processes are alike in L1 and L2 (McCarth et al., 2010).

Different processes determine how words are organized in the mind: Input, storage, and retrieval: *Input* is about how words are recorded, *storage* concerns how words are retained, while *retrieval* has to do with recalling words. For Krashen and Terrell (1983), second language learners acquire the language best if they are exposed to *input* that suit their competency level (McCarthy et al., 2010).

Despite the fact that semantic relations between words are crucial for storage, words have private meaning for us. For example, if we were to depict a network for holidays, we would have something founded on our own experiences and knowledge of the world, the following is an example:



(McCarthy et al., 2010).

In this situation, knowing a word involves linguistic, experimental, and world knowledge. It proposes that our *storage* of words is very linked to how we store memories and experiences. Instead of thinking of words as stored in the mind in an organized way, this outlook of storage proposes that we should think in relation with networks. In addition, this view identifies that every word –every network- is continually renovated as novel vocabulary is acquired. The metaphor of network which is frequently in a situation of instability is, may be, the most helpful one, as it communicates the active nature of the mental lexicon. Links in the brain between words are continually made and re-made, reinforced and hardened. This theory of the way words are stored is usually called **connectionism** (McCarthy et al., 2010).

One of the aspects of knowing a word is being capable to *retrieve* (recall) it when required. Retrieval varies depending on whether words are receptive or productive (McCarthy et al., 2010). According to McCarthy (1990), receptive retrieval *"involves matching spoken or written input to stored sound and orthographic patterns and their associated meanings" (p. 43).* This is why, for example, in a reading activity, it is crucial to get learners NOT to concentrate on each single word, but to just recognise words. Hence, they will become more rapid and more effective (McCarthy et al., 2010). Visual word recognition has to do with the processes by which readers distinguish written words. Recognizing a word permits a reader to use the word's semantics to decide about its meaning. Proficient readers are characterised by the capacity to recognize words rapidly and almost effortlessly (Strazny, 2005).

Productive retrieval signifies being capable of making more active use of a word, in a piece of writing, for example. Here, receptive and productive are not equivalents of passive and active, as these latter terms are sometimes kept for talking about the skills and the notion that 'reading is a passive, speaking is active' (McCarthy et al., 2010).

The majority of vocabulary acquisition is implicit, or 'accidental'. While teachers usually embrace some classroom operations to teach vocabulary explicitly, it is adequate to tell that learners acquire most of their novel words implicitly, or subconsciously (McCarthy et al., 2010).

2.9.3.2. The Organisation and Development of the L2 Mental Lexicon

L2 vocabulary growth is affected by the arrangement of mental lexicon. The mental lexicon, according to Hulstijn (2000), is *"a memory system in which a vast number of words, accumulated in the course of time, has been stored" (p. 210).* This organisation is thought to be systematized as it is the only justification for the truth that people are able, at a chocking speed, in a huge amount of lexical items stocked in memory. Human memory is so supple and it is capable of processing a huge amount of input, yet just in case it is methodically arranged (Takac, 2008).

The mental lexicon provides various entries to knowledge; processes of word identification and word production stimulate more words than needed, just to form an ultimate choice and conceal excessive knowledge (Takac, 2008).

Considering what has been said on the top, it is presumed that the position of a word in the mental lexicon should be symbolized by a three dimensional pattern, as McCarthy (1994) states*: "with phonological nets crossing orthographic ones and criss-crossing [intersecting] semantic and encyclopaedic nets" (p. 41).* Yet, the connections between single networks are so delicate and are able to detach. This is noticeable in situations when a speaker forgets about the pronunciation of a previously learnt word, though knows that it exists and what it signifies, etc. This case added to the truth that a speaker of a language can comprehend new forms, is usually thought of as proof sustaining the split between receptive and productive vocabulary. Speakers of a language presume that receptive vocabulary is a lot bigger than productive vocabulary, and that receptive vocabulary comes first. Yet, the recent literature criticises this division as being very simple in that it entails the notion of the mental lexicon as a fixed unit involving two disconnected parts (Takac, 2008).

According to Hulstijn (2000), likenesses and dissimilarities between L1 lexicon and L2 lexicon (s) can be recapitulated into four main hypotheses:

-the extended system hypothesis: L1 and L2 words are stored in the same store;

-the dual system hypothesis: L1 and L2 words are stored separately;

-the tripartite hypothesis: alike words share the same store (like cognates), where language-specific words are stored in independent stores;

-the subset hypothesis: L1 words and L2 words are stored in two rather detached stores, which are themselves stored in a joint store.

Meara (1986; as cited in Takac, 2008) ends up, on the basis of his scrutiny, that methods for word storage and treatment is different with L2 mental lexicon (comparing to L1). She says that learners use techniques inappropriate for that particular language, which can explain certain complexities in L2 learning. Swan (1997) states that one should end up that there are *"... significant...differences between the L2 mental lexicon and the L1 mental lexicon for all language learners" (p. 175).* Henning (1973; as cited in Takac, 2008) who examined the factor of lexical coding in memory, concentrated in his study on two factors, the one of semantic and that of acoustic classification, Henning tried to answer the question if L2 learners code vocabulary in the memory in acoustic or semantic groups, and if there is an association between learners' competence and the kind of coding. The outcomes showed that learners do code vocabulary in phonological and semantic groups. More specifically, proficient learners depended more on meaning rather than sound (in contrast with less proficient ones). Hence formal processing is as important in L1 as in L2 mental lexicons, mainly in the first phases of learning, while semantic processing takes place at a later phase of linguistic development. According to Takac (2008), The Trinity College Dublin Modern Language Research Project has demonstrated that lexical interrelations were semantic pragmatic in nature (at least in the tests used in the researches). In addition, their results refuse the notion that L1 and L2 mental lexicon are disconnected units, yet do not propose their full incorporation either. Singleton (1999) presumes that the correlation between an L1 and an L2 word in the mental lexicon differs from one individual to another. This proposes that the arrangement stores (like L1 and L2 links) in the mental lexicon relies on how the word has been acquired, and on the observation of formal/ or semantic likeness between the L1 and L2 word.

Several researches, stated in Gass (1989), appear to link the arrangement of the mental lexicon with the idea of prototypes. The theory of lexical prototypes involves the notion that certain concepts are essential (Takac, 2008), or *"best-fit members of a conceptual category"* (Gass, 1989). McCarthy (1994) gave the example of the domain of 'vhicle' where the majority of natives would state 'car' as the prototypical element of the class, with items like 'boat, scooter, tricycle, horse, skis' coming next.

2.9.3.3. Stages of L2 semantic development

Learning the significance of new words is surely a developmental process. It involves two phases for the majority of L2 words. One is **the comprehension stage** which is the primary understanding of a word's significance or the primary mapping of new word forms to prior significances or notions in the learner's mind, or L1 translation. It permits a new L2 form to be attached to higher level semantic or conceptual representations so that to be retained and used as a significant unit in the learner's lexicon (Bogaards & Laufer, 2004). Ellis (1997), for instance, states that:

> *"in the first instance at least, the acquisition of L2 words usually involves a mapping of the new word form onto pre-existing conceptual meanings or onto L1 translation equivalents" (pp. 133-34).*

Parallel beliefs have been communicated by Blum & Levenston (1978), Strick (1980), Ringbom (1983), Giacobbe (1992), and Hall (2002) (Bogaards & Laufer, 2004).

Moreover, the mapping onto the prior L1 translation or significance, or semantic transfer, probably happens as much as there is an already present word or concept which is comparable in significance to the target word. To transmit the significance of the new word, i. e. when the significance of the new word is understood, it can probably be understood in the prior semantic or conceptual system. Also, as concept and L1 words are strongly related, a bond will be made between an L2 word and its L1 translation once the significance of the L2 word is understood. This L2-L1 bond is set up in spite of whether L1 is or is not used in the semanticization process (Bogaards & Laufer, 2004).

It is logical to presume that the majority of L2 words do have alike concepts or words in the learner's L1 and hence are primarily understood within the prior L1 semantic system. This is why 'comprehension' is a correct term than 'acquisition', a term, at times used by certain researchers (e.g. Ellis, 1995), to mean the semantic processes included at this stage (Bogaards & Laufer, 2004).

As for **The development stage**, primary mapping onto an L1 concept or parallel translation permits an L2 word to be used appropriately to a certain level. However, proper and idiomatic use of L2 words needs the building of semantic structures that are exclusive to L2 words. This usually includes the reorganization of the semantic content initially transferred from L1 (Bogaards & Laufer, 2004). A number of researches showed that with prolonged exposure to contextualized L2 input, the learner should be capable of making new concepts or restructure semantic constituent to make new significances for L2 words (Blum & Levenston 1978, Giacobbe 1992, Ringbom 1983, Strick 1980; cited in Bogaards & Laufer, 2004). This reorganization is permitted too in de Groot's model of bilingual conceptual representations, when an L2 word may be related to a different group of significance constituents from its L1 translation (Bogaards & Laufer, 2004).

Another view is that reorganization process may be slow or partial. This can be an outcome of restricted contextualized exposure to the target language, or learners', at times, succeeding to use L2 words relying on L1 meanings. As a consequence, an L2 word stay mapped to a vastly L1 based concept. These options are explained by Weinreich (1953) who spoke about 'habitualized and established' transfer. Moreover, these options are examined in Selinker and Lakshmanan's (1992) debate of the link between language transfer and fossilization. In bilingual language processing studies, it is presumed that a bilingual's two languages share one conceptual system (Selinker & Lakshmanan 1992; Weinreich, 1953; cited in Bogaards & Laufer, 2004).

-Research into Vocabulary Acquisition and Organization

One of the first current researchers to deal with L2 vocabulary acquisition was Ebbinghaus (1995; as cited in Schmitt, 2000). He carried out a self- experiment in which he systematically attempted to learn a simulation language and cautiously registered his growth. To assess his retention of the nonwords he examined (like JEV, ZUD, VAM), he assessed himself through a *paired-associates* method. He viewed the nonword and if he could provide the English parallel, he judged it to be learned. This experiment tests the way the total of exercise influenced the size of the vocabulary learned, and showed that a quantity of small amounts of time are more efficient than a single longer time.

A subsequent row of study investigated the way words were related to each other in the mind. The technique used to determine this was *word associations.* Participants were provided with a quick word (red) and were inquired to provide the first word that crosses their thinking (e.g. White, blood, colour) (Schmitt, 2000). Galton (1879-1880) precedes the first experiment on word associations, using himself as a sole participant. Few time later, Cattell and Bryant (1889) proceed the first huge range association research, gathering association answers from about five hundred (500) participants. The results seem to be like those of the latter study: there is an enormous reliability in the associations made by a set of participants, proposing that these latter have alike types of mental relationships between words (Cattell & Bryant, 1889; Galton, 1879-1880; cited in Schmitt, 2000).

From the other hand, L2 acquisition is different from L1 acquisition in the sense that L2 learners have previously gone through acquiring an L1, and they are cognitively grown up. While L1 children should learn how things are present and function in the world, L2 learners previously learned these concepts, and therefore, for them, the process may be about renaming the already known concept with an L2 word. Yet, even if certain L1 study may not be useful, it is considered a significant source (Schmitt, 2000).

2.9.3.4. Reserch into Intralingual and Intralexical Factors in L2 Vocabulary Learning Difficulties

The grounds of the processes of the L2 lexicon are phonological instead of semantic; Laufer (1989) states that:

> *"while in the native speaker's mental lexicon there are strong semantic links between the words, the connections between words in additional languages are primarily phonological" (p. 17).*

Laufer (1990, 1991, 1993-94, 1997) re-examined an amount of researches scrutinizing problems in the nature of target words themselves. Her debate concerning what she named ‘intralexical’ complexities tackles both the formal area and the semantic area –Formal intralexical complexity factors discovered by Laufer involves pronuncibility, length, grammatical class and morphological difficulty. In terms of pronuncibility, Laufer stated that this latter is an aid factor for word view when meaning is not present. In an experiment by Gilson and Levin (1975), the learners of different language experiences were examined on their view of a set of words. The outcomes reveal that those words which were simpler to pronounce were more properly viewed (Gilson & Levin, 1975; Laufer, 1990, 1991, 1993-94, 1997; cited in Singleton, 1999). Rodgers’ (1969) research shows that Russian words which were easier for learners to pronounce were more probably memorized than those that seem to be difficult to pronounce.

In relation with word length, proof appears to be quite diverse. While Rodgers (1969) does not get that length is an important variable, Stock (1976) obtains that one-syllable word is better retained than two-syllable words but three-syllable words are better retained than one-syllable words, by English-speaking learners of Hebrew. Yet, Phillips (1981) recognizes length as an important aspect in the learning of French words by English speakers, however, he got that it went down for advanced learners (Phillips, 1981; Stock, 1976; cited in Singleton, 1999).

With regard to parts of speech, Rodgers (1969) notices that nouns and adjectives are more easily learned than verbs and adverbs. Philips’ (1981; as cited in Singleton, 1999) participants seem to have little problems learning nouns than learning verbs and adjectives, yet this influence went away as they become advanced learners.

In relation with semantic-pragmatic intralexical complexity factors, these, for Laufer (1994), involve specificity of meaning, multiple meanings, metaphorical meaning, connotational and stylistic differences, and synonymy. As for specificity, Blum and Levenston (1978) obtain that non-native learners of Hebrew tended to use more general terms where natives tended to use hyponyms, i.e. more exact terms -they rather choose to use, for example, the Hebrew synonym of *put* rather than the synonym of impose (Blum & Levenston, 1978; Laufer, 1994; cited in Singleton, 1999).

Lexical complexities were linked to some metaphorical usages of words, Dagut and Laufer (1985; as cited in Singleton, 1999) claim that the most frequently terms bypassed by Hebrew speakers were phrasal verbs in English distinguished by metaphorical meaning and by the semantic incorporation of the individual elements of the verb –*let down , show off, put up with*, etc.

In relation with connotational and stylistic differences, Laufer proposes that the L2 learner probably does not feel such difference between couples of words like *skinny* and *slim*. This besides problems learners of English as L2 usually face with regard to register dissimilarities as they influence a set of synonymous phrases like *about, around, more or less, approximately* (Halliday, , Alexander, Angus, , & Paul, 1964).

In the end, we arrived at the problem of synonymy. Laufer (1994) deduces, from her researches, that once an L2 learner has acquired one form, acquiring more for the same term is considered a waste of time and effort. Moreover, along her examination of L2 lexical complexities, Laufer (1994) found that the semantic-pragmatic elements represent most of the challenge in L2 lexical acquisition (Laufer, 1994; cited in Singleton, 1999). This entails that the main job of the L2 mental lexicon to acquire novel vocabulary includes the processing of meaning instead of form. As Sonaiya (1991) states: *"the primary task in vocabulary acquisition is seen as one involving continuous refining of meaning and readjustment of boundaries between lexical items that have already been acquired and subsequent items that are encountered"(p. 274).*

2.10. The Source of Vocabulary (Exposure to Linguistic Input)

Despite the fact that certain studies have proved the supposition that L2 vocabulary can be acquired via exposure to numerous context too (like reading, see Sternberg, 1987), these outcomes, as Nagy (1997; as cited in Takac, 2008) claims cannot be explained without allowing the factors that immediately influence the effectiveness of process. Obviously, the function of the context success of contextual inferencing will rely on the learner's competence level, i.e. on the classes of information (linguistic information, world information, etc) that the learner requires to employ.

Beginners do not have sufficient linguistic information; therefore they have to make thoughtful trials to learn lexical items usually linked to synonym, definition, translation into L1, etc. A considerable size of vocabulary can be acquired via rote learning. Yet, vocabulary acquisition is not just a mental set of single lexical with a one to one conformity to L1 lexical items. Familiarity with a lexical item involves more than learning its semantic feature. Vocabulary learning is the acquisition of stored series of lexical items that function as a model, essential for the learner to create novel series. The major activity is to find out the models in the language, beginning with phonological classes, phonotactic series (i.e. permissible organisation of phonemes), and morphemes, to collocations and lexical phrases, and their analysis into significant units (that are units of memory arrangement). This entails that language production is founded on gathering ready-made units appropriate for specific cases (Pawley & Syder, 1983). Specifically, as Ellis (1997) mentions, *"native speakers do not exercise the creative potential of syntactic rules of a generative grammar["...*set of rules whose output is all (and only) the <u>sentences</u> of a <u>language</u>—i.e., of the language that it generates."*(Generative grammar, 2016, ¶ 1)]" (p. 129)*; despite the fact that expressions like: 'I wish to be wedded to you', 'Your marrying me is desired by me', 'My becoming your spouse is what I want' show a good grammar skill, yet they are strange in contrast with 'I want to marry you'. Hence, native-like choice is not just a matter of syntactic rules; talking natively means talking idiomatically, using frequent and known collocations (Pawley & Syder, 1983). As for Ellis (1997), the activity of the L2 learner is to acquire lexical series (collocations, phrases, and idioms). A prerequisite for a mechanical analysis of information like this is enough exposure to language input or straightforward teaching and consciousness boosting (Takac, 2008).

An essential source of vocabulary in L2 learning is a large extent of contexts. Nagy (1997) states that an average learner can learn to distinguish up to 1000 words per year from written context which importance develops as the learner's information increased. Ellis (1997) thinks that a perfect source for learning L2 vocabulary from context is reading. Context-based inferencing helps in the knowledge of morphological laws, collocations, extra significances (as it is the context that controls the significance of a lexical unit), etc. Yet, straightforward exposure during reading does not ensure a fast vocabulary development. For the purpose of speeding up the process, the learner should have analytical strategic knowledge that will permit him to alter the accidental learning to explicit learning process (Ellis, 1997; Nagy, 1997; cited in Takac, 2008).

According to Ellis (1994), the function of vocabulary learning strategies is crucial in vocabulary learning; it stimulates explicit learning that involves various features, like making conscious effort to remark novel lexical items, context-based inferencing and storing into LTM. Yet, the effect of other factors that explain personal dissimilarities, like the affective ones (motivation, attitudes toward vocabulary learning, fear of failure) or the language learning ability must not be ignored (Takac, 2008).

2.11. The Cognitive Approach to Teaching Vocabulary

Approaches are strongly affected by theories of second language acquisition (SLA) that try to demonstrate how languages are learnt. McCarthy et al. (2010) classify these strategies into: **Behaviourism, cognitive, interactional (teaching/ learning**), lexical**, and sociocultural strateg**. From the other hand, Schmitt and McCarthy (1997) classify the entire learning strategies into: strategies *for finding out* and *strengthening* a word, that involve determination, social strategy, and memory strategy, cognitive and metacognitive strategies. We will concisely tackle the cognitive theory, Cognitivism, and sum up its implications for teaching/learning:

Cognitivist theories of SLA sustain that language acquisition is a cognitive task. The best popular name in this belief is Chomsky, whose theory of Universal Grammar (1965) argues that we all have an interior capacity to learn a language, usually by the age of ten (10). He sustains that human-beings have a predisposition to language acquisition. With regard to input, advocates of this belief argue that input should be at or a little over the learners' actual level and that there must be a '*silent period*' when learners are not supposed to say a word. Moreover, this theory strongly adopts an implicit outlook of learning novel words (McCarthy et al., 2010).

The cognitive approach has generated research interest: instead of focusing on the learning itself, researchers are now trying to determine how individual learners approach learning. Namely, cognitivists take the view acquire different types of knowledge in different ways, even in what seem to be highly similar situations. Individual differences are considered a powerful factor in language acquisition. A pedagogical implication is that L2 teachers should identify and understand significant individual differences in their learners if they are to conduct effective teaching (Takac, 2008).

Conclusion

Learning a second language lexicon is not an easy matter; many internal (like the L1, the organization of the mental lexicon, memory) and external factors (like motivation, learning strategies, and teaching strategies) are involved to make it more or less difficult and work together to achieve the ultimate goal of learning English as a foreign language.

Chapter III
Lexical Inference as a Verbal reasoning Capacity in Second Language Reading

Introduction

Despite the fact that, as demonstrated in the two previous chapters, L2 vocabulary size is considered as one of the main factors that influence language learning generally, L2 readers, specifically, are not able to understand a whole text in case they cannot distinguish the words in that text. Yang (2014) proposes that word knowledge is related to reading comprehension and that readers with better vocabulary knowledge are better 'comprehenders'. The Report of the National Reading Panel (2000) stated that enhancing the reading skill depends on vocabulary knowledge.

Yet, it not an easy matter to know every single word, mainly for EFL learners, to understand written discourse (or spoken discourse). So, how do ESL learners handle unfamiliar words while reading English texts?.

One reasoning method that learners employ to deduce the meaning of unknown words from written material is word-meaning inference/ lexical inference; or what Haastrup (1991) named *"informed guess" (p. 40)* as it is built mainly on top-down cognitive processes that relies on using information previously stored in our memory. Hence, this chapter 3 concentrates on reviewing what is known about this verbal reasoning ability named lexical inference.

3.1. Reasoning

Reasoning, as Smith (1992) mentions that is not an exclusive intellectual activity, or an item with definite use. At times, the word is used equally with thinking; actually, reasoning is a usual definition of thinking. Reasoning at times includes arguing about a reached conclusion; at times convincing another person to admit a conclusion. It can be a clarification of the past or a debate about the future. All these features of reasoning are related in the sense that they comprise shifting from one situation to another or explain how or why such a shift occurs. Reasoning tries to link ideas or actions together in a continuous chain of connections. However, everything can be linked to something else in some means. What is significant here is the sort of such links- whether they are reasonable or justifiable. There are no general regulations for proper reasoning; this capacity takes place with comprehending what you are attempting to reason about. No regulations make a proficient reasoner in computer sciences but his experience. In addition, even people reasoning from the same basis may arrive at very different conclusions (like politicians). Reasoning is often utilized to argue about an attitude (any attitude wanted) instead of reaching the right one.

Moreover, the links in a chain of reasoning never end; there are always ideas or arguments that have to be filled in by the listener or the reader. If a child was missing from school because of sickness, I am likely to presume (accurately or inaccurately) that it is the child who is sick not another family member that he stayed at home or in his bed, etc. Johnson and Blair (1985; as cited in Smith, 1992) refer to such omitted ideas as charity, they claim: 'charity begins at home' - people are more likely to translate arguments in the way that is mostly reasonable to them. However, reasoning is clear. There is always a reason behind behaving in a way or another even if this is not obvious sometimes.

When we say that the others do not reason, we imply that they reach different conclusions from ours, or they are not able or don't want to give reasons for reaching a specific decision- or reasons that please our reasoning. Our way of reasoning is different from that of the others- not because of the different degrees in skills but different [worldviews]. If we would like- and could perceive things through the others' eyes, then we would be able to learn about the others grounds for their way of thinking (Smith, 1992).

Reasoning, as a mental activity, has two forms: Inductive and Deductive. While inductive Reasoning has to do with possible conclusions resulting from their premises, Deductive Reasoning has to do with conclusions that come after, with certitude, from their premises. If we propose that 'Fred is the brother of Mary' and that 'Marry is the mother of Lisa'. So, one might infer that 'Fred is the uncle of Lisa' and that 'Fred is older than Lisa'. The first conclusion would be a valid deductive inference, while the second is not a right deductive inference, as it is not inevitably valid (Anderson, 2000).

3.2. Verbal Reasoning

Verbal reasoning is one of four major cognitive reasoning skills. When the majority of people talk about learning, they are discussing the capacity to use verbal reasoning skills. Verbal reasoning includes making meaning relying on the information provided, going further that information to a better understanding and using verbal skills to new learning. When speaking and listening are elements of verbal reasoning, the majority of formal verbal reasoning includes reading and writing (Donges, 2016, ¶¶. 1-2).

The verbal reasoning is related with the capacity to analyze and evaluate written material, synthesize information got from it, and to identify connections between words and concepts ("Introduction to the verbal", 2009).

Comprehension of discourse is a main component in verbal reasoning. It includes the reader's existing knowledge, using information in discourse, and making inferences. The agreement of a quarter century of cognitive research on reading describes it as an active process that includes constructing a mental representation of the text *("building meaning")*, retrieving associated information from memory, assessing differences between text and the reader's prior knowledge, inferring required to fill blanks in understanding or making meaning clear, incorporate relevant novel information into the reader's knowledge (Burton, Welsh, Kostin, & VanEssen, 2009).

One main background required for fluent reading is vocabulary. Lohman (2000) says that:

> *...the high correlation between vocabulary knowledge and*

> *reasoning seems to reflect primarily the fact that word meanings are generally inferred from the contexts in which they are embedded. But there is a synergism [cooperation] in that vocabulary knowledge allows comprehension and expression of a broader array of ideas, which in turn facilitate the task of learning new words and concepts. Thus, language functions as a vehicle for the expression, refinement, and acquisition of thought" (p. 319).*

Generally, reading is all the time needed when the reader is primarily learning to read or crosses novel context. When the reader turns out to be more proficient, and as his/ her knowledge of the context develops, reading comprehension turns out to be more unconscious, needing few reasoning few reasoning at a conscious level (Burton, et al., 2009).

Models of comprehension are different, yet various among them share alike ideas of the major cognitive elements and processes included in comprehension. Certain main ideas (related to memory network) adjusted by Graesser, Millis, and Zwaan (1997) are next:

1. The mental representation of the text, besides the reader's knowledge base, is thought of as involving nodes, [derived from the Latin word for *knot*] interrelated by relational ties or arcs (associations). The nodes may be such things like concepts or things.

2. Nodes in the reader's knowledge base are stimulated when they show in text; the stimulation extends to relatively linked nodes in the knowledge base by means of relational arcs (Anderson,1983). Persistent reading may stimulate other nodes, boost the stimulation level of nodes formerly stimulated, or prevent nodes. For example, referring to bridge in text may stimulate a node for a building over a river and a second node for a card game; as reading continues, one of these nodes will be suppressed. Nodes can be thought about as connected with cities, and associations as being the highways that relate the cities. Learning using this metaphor would be like constructing a highway between two cities, or

may be developing an already being highway, for it can be more easily and rapidly visited. Here, some ‘cities’ are related by superhighways, others just by connecting country roads. Other cities are disconnected. This illustrate why certain memories are easily retrieved, while others are not (Reisberg, 2001).

3. Different memory stores are involved in most reading models: short-term memory, working memory, and long-term memory. Short-term memory and working memory are considered to have restricted ability, just retaining the newest information being processed. Certain models have just one of these two; in models that have both, short-term memory has a smaller ability and working memory has some processing capacity, like recycling important information.

4. as adapted by Chapman (1993; as cited in Graesser et al., 1997), knowledge structure is reinforced (accessed more rapidly, remembered better) when

• it is harmonious with other knowledge structures (a text can easily be incorporated with the reader’s knowledge base if it suits the limits of the existing net of nodes and relations

• the reader builds causal explanations for the content or presentation of the text; for example, what may have caused the incident in a narrative or what the writer means, and

• it is frequently accessed.

An enlightening and different way to understand critical reading is to investigate the behaviors of *less able readers*, who

• have limited vocabularies,

• have gained less knowledge from previous reading and may have less private experience about the topics read,

• stay nearly fully within the literal sense of the text,

• concentrate on separate words and sentences, details, and individual pieces of information,

• add detached facts to their previous knowledge base,

• concentrate nearly exclusively on content instead of context, structure, rhetorical tools, or author's intentions,

• arrange remembrance in the form of lists,

• evaluate their comprehension in relation with the number of facts they can remember,

• make few trial to observe their own understanding,

• depend on one or two critical reading strategies, not inevitably using them steadily,

• do not differentiate between the demands of different types of texts and different objectives for reading, and

• stop when not capable to comprehend text

3.3. L2 Reading Comprehension

3.3.1. Models of Reading Comprehension

3.3.1.1. The Psycholinguistic Model

Goodman (1967) defines reading as *"a psycholinguistic guessing game, involving an interaction between thought and language" (p. 498)* and perceived the building of sense of a text as a cyclical process of sampling, predicting, testing, and confirming. In this sense, it is a process of checking a hypothesis via information in the text (Carell, Devine, & Eskey, 1998).

As for Coady (1979), he has proposed a model in which the EFL/ ESL reader's background knowledge interacts with conceptual capacities and process strategies, more or less effectively, to make comprehension. By conceptual ability, Coady refers to general intellectual ability while he refers to several subelements of reading capacity by processstrategies (Coady, 1979; cited in Carell et al., 1998).

3.3.1.2. The Schema Theory Model

The function of background knowledge in language comprehension has been formalized as schema theory. According to this theory, a text just offers ways for listeners or readers to recall or build sense from their background knowledge. The prior acquired knowledge structures are named schemata (Carell et al., 1998). Anderson, Reynolds, Schallert, and Goetz (1977) consider *that "every act of comprehension involves one's knowledge of the world as well" (p. 369).*

3.3.1.3. The interactive models of Reading

Theorie about the cognitive processes related to reading treat the two models differently. For example, *daylight saving time ends tomorrow and so people should remember to change their...* The top down outlook consider that the reader guesses the following word to be *clocks.* The bottom up model states that the reader processes all the letters in the last word of the sentence, regardless of the word's guessability (Treiman, 2009).

In a 'bottom-up' models of reading, initial letters are distinguished, later sounds are connected them, and the word meaning is added. At last –after the words are processed- the sentence meaning is understood (Tracy & Morrow, 2012). Brown (1994) states that it has to do with *"decoding meaning from the printed page, recognize linguistic signals, and use linguistic data processing mechanisms to impose some sort of order on these signals" (p. 284).* On the other hand, 'top-down' models of reading rely on the presupposition that the reading process is mainly conducted by what is in the reader's mind instead of what is printed on page. 'top-down' models of reading focus on the value of a reader's background knowledge through the reading process. This latter involves information from different sources: knowledge about the subject, knowledge of text structure, knowledge of sentence structure, knowledge of word significance (vocabulary), and knowledge of letter-sound conformity. According to these models, readers use all of these sources of information to make expectations and hypothesis about forthcoming text. When the forthcoming text is compatible with a reader's hypothesis and expectations, the reading process proceeds quickly and smoothly, with the reader proving his/ her hypothesis and predictions. Otherwise, reading decelerates, and the reader observes more carefully the present text. The term 'top-down' came from this huge independence on the reader (instead of the text) through the reading process (Tracy & Morrow, 2012).

Rumelhart (1977, 1994) remarks that Gouph's (1972) and Laberge and Samuel's (1974) models are '*linear',* i.e. information can just be passed in one way, from lower level processing to higher level processing ('bottom-up' models). Henotices that through the reading process, there are several times in which higher level processing (like understanding the meaning of a sentence) contributes in lower level processing (like word distinctions). In fact there are several means that words are distinguished throughout reading; word distinction is not restricted to 'bottom-up' distinction processes. Rumelhart argues that an appropriate model of the reading process is required to show this phenomenon; so, he made his **Interactive Model**which main attribute is that the reader uses information that is given from different sources, throughout the reading process, at the same time. It is the first model of reading to suggest a non-straight synchronous opinion of information processing made by Rumelhart (Rumelhart, 1977-1994; cited in Tracy & Morrow, 2012). Therefore, 'Interactive models', word relate to the reader's 'internal talk', are thought of as synthesis of the two models, yet more top-down models which is likely to be *'meaning driven'* (Manzo & Manzo, 1995).

3.3.2. Language and Reading Comprehension in L2

Cognitive process models sustain the issue that language proficiencies are fundamental to reading comprehension. For instance, the Landscape Model of Reading depicts comprehension as the outcome of continuing efforts to build and then check out a coming out mental model of text by using temporary text hints, using background knowledge and making inferences to generate an incorporated coherent representation of the text. Vocabulary and other language skills are essential to have access to background knowledge, and syntax is needed for appropriate interpretation of textual details (Richards, 2009).

When theories of comprehension give a major function to language, the language-related proficiency usually associated with reading skills is vocabulary. In agreement with this viewpoint is the theoretical explanation of the relationship between language and reading improved by Ravid and Tolchinsky (2002), who see acquisition of literacy-related forms of language as being closely connected to skilled reading. To sustain this theory, Ravid (2006) illustrated that in adolescence children gradually use more abstract nouns that is more usually learnt in expository than narrative texts and in written than spoken narratives. More proof shows that reading comprehension needs developed language skills besides the semantic knowledge and inferential ability that are related to vocabulary (Ravid, 2006; Ravid & Tolchinsky, 2002; cited in Richards, 2009).

3.4. Examples of Vocabulary Learning Strategies

Schmitt (1997; as cited in Schmitt, 2000) considers that there are various different vocabulary learning strategies, with one list including fifty eight (58) different strategies. The list is split into two main categories: 1) strategies that are useful for the primary detection of the word. 2) those useful for remembering that word after it has been encountered. This shows that there are several processes essential for finding out a novel word's meaning and usage, and for reinforcing it in memory for later use. Second, the strategies categorization is further grouped into five classes. The primary involves strategies used by a person when encountered with finding out a novel word's meaning without refuge to another person's proficiency: *determination strategies (DET).* This can be made via guessing from one's constructional knowledge, guessing from context, guessing from an L1 cognates, etc.

Social Strategies (S0S) use communication with other people to enhance language learning. One can ask teacher or classmates for information about a novel word and they can respond in several means (synonym, translation, etc.). Yet, Schmitt's investigation proves that most learners (his Japanese students as a minimum) favoured to study vocabulary alone (Schmitt, 2000).

Memory strategies (MEM), called previously mnemonics, linking the word to certain prior knowledge to be stored, using a kind of imagery (images of the word's form for instance). Mnemonics include concentrating on the target word's orthographic or phonological form to simplify retrieval. The use of body when learning has been proved to be useful in language retrieval (Saltz & Donnenwerth-Nolan, 1981). Asher (1977; as cited in Schmitt, 2000) has considers it the foundation of an entire methodology, the TOTAL Physical Response Method (TPR), which appear to be more suitable for teaching beginners.

Memory strategies include the type of studied mental processing that ease long-term storage. A learner may be in short of time to *'deeply process'* each faced word, yet it surely deserves trying for keywords (Schmitt, 2000).

Cognitive strategies (COG) display, as the Oxford (1990) dictionary mentions, the usual function of the *"manipulation or transformation of the target language by the learner" (p. 43).* They are close to memory strategies, yet are not concentrated particularly on controlling mental processes; they involve repetition and using non-reflective ways to examine vocabulary involving having vocabulary notebooks (Schmitt, 2000).

Lastly, **Metacognitive strategies (MET)** include a conscious general idea of the learning process and making decisions about preparing, examining, or assessing the best means to study. This involves enhancing access to input, determining the most effective techniques of study, and assessing one's development. It involves determining the words that deserve studying and that are not, besides continuing to make effort with the words one wants to learn (Schmitt, 2000).

Studies have shown that models of strategy can alter as a learner grows up or turns out to be more competent in the target language (Schmitt et al., 1997; cited in Schmitt, 2000).

Hence, it appears that learners do use strategies and think they are useful. This proposes that we should inculcate strategy training in our classes, yet bring the issue of the extent of the effectiveness of such training in language learning. Kern (1989) claims that according to certain researches, there is a considerable level of achievement while others claim the achievement is restricted. It appears that a lot is reliant on the learner's ability. McDonough (1995) re-examines strategy training investigation and, apart from other things, finds out that development resulted from strategy training is quite fragile and reveals just few assessments, is related to culture, and may work better for beginners (Kern, 1989; McDonough, 1995; cited in Schmitt, 2000).

In Schmitt's (1997) classification of strategies for L2 vocabulary learning, lexical guessing is a finding strategy. Harley and Hart (2000), in a research with 35 secondary school learners of French in Canada, found that L2 vocabulary strategies familiar with these learners involved guessing word meanings from contexts, using bilingual dictionaries, and soliciting help from teachers and friends (Harley & Hart, 2000; Schmitt, 1997; cited in Bogaards & laufer, 2004).

According to the book: *Reading Framework for the 2003 NEAP (national assessment of education progress)*, for the purpose of reaching proficiency, readers *"should be able to extend the ideas of the text by making inferences, drawing conclusions..." (p. 28).* So what is inference/ lexical inferencing?

3.5. What is Lexical Inferencing

Vocabulary inference is a cognitive process L2 readers use to learn the meaning of new words. Lexical inferencing includes knowledgeable guessing of the meaning of an unfamiliar word with the aid of all accessible linguistic hints and other sources of information that the learner can use (Bogaards & Laufer, 2004). In this sense, Carton (1971) states that inferencing is a process in which knowledge is used to distinguish what is unfamiliar, when he said that inferencing

> *"is intended to refer to a process of identifying unfamiliar stimuli...Inferencing, attributes and contexts that are familiar are utilized in recognizing what is not familiar*" *(p. 45).*

Moreover, according to Haastrup (1991) lexical inferencing includes:

> *"makinginformed guesses as to the meaning of a word in the light of all available linguistic cues in combination with the learner's general knowledge of the world, her awareness of the co-text and her relevant linguistic knowledge."(p. 13).*

Lexical inferencing is a lot more than only 'guessing from context', since learners use their prior knowledge and the textual context to guess the significance of unfamiliar items. It would be better to consider lexical inferencing as being adequate guessing of the significance of lexical items *in* context, instead of guessing *from*, since contextual hints are just one of various information sources (Schmitt, 2010). Hence, lexical inferencing is about guessing the meaning of unfamiliar words relying on different sources of knowledge.(Sources knowledge will be talked about in details as part of the processes involved in lexical inferencing).

3.6. Early Studies of Lexical Inferencing

Carton's (1971, as cited in Wesch & Paribakht, 2010) scrutiny from the double viewpoints of psychological processing and language stressed the kinds of hints to word meaning accessible to language learners in L2 texts and the types of information these could offer to help in learners' acquisition of novel linguistic knowledge. Carton (1971) is the first to publish an in-depth study in foreign language learning of what was named after that lexical inferencing. For him, 'inferencing' including the use of 'attributes and contexts that are familiar...in recognizing what is not familiar' was a process that has a significant function in the acquisition of new morphemes in "natural" contexts (Carton, 1971).

In the early to mid 1980s, numerous researches proposed that children's enhancement of L1 vocabulary mastery through schooling might be strongly linked to learning via extensive reading (Nagy & Anderson, 1984; Nagy et al., 1985; Nagy & Herman, 1987; Sternberg, 1987; cited in Wesche & Paribakht, 2010).). This has influenced studies on L2 reading comprehension, vocabulary learning via reading, and lexical inferencing (Wesche & Paribakht, 2010).

In 1983, Bialystok, working in an L2 learning context and relying on Carton's work, made several experiments to test if L2 learners, in short of environmental hints that ease contextual language learning by L1 children, could be aided to infer word meanings more efficiently while reading if given additional information (like by giving mini lessons on inferring), to enhance L2 readers' inferencing for successful word comprehension (Wesche & Paribakht, 2010). In the same year, Sternberg and Powell (1983) working from the perspective of psychology made a framework for the global inferencing process. Sternberg (1987) in a paper under the title '*Most Vocabulary Is Learned from Context'* talks about the framework as it is connected with inferring L1 word meanings. His example was American high school students learning low-frequency L1 English words via reading. The framework presume three essential knowledge acquisition processes that permit meaning to be inferred from contextual hints: *Selective encoding* (deciding about what information is appropriate), *selective combination* (joining appropriate information from different hints into a significant whole) and *selective comparison* (linking the novel information with what one previously knows).

Various other researches of word guessing by L2 learners, inspired by work on incidental vocabulary learning in L1, have been carried out at that time. This reported a broadly quoted paper by Bensoussan and Laugher (1984) who claim a high percentage of incorrect guesses and consequential weak text comprehension among their less competent ESL Israeli students. Another research, by Liu and Nation (1985), explains factors that affected contextual guessing (Bensoussan & Laugher, 1984; Liu and Nation, 1985; cited in Wesche & Paribakht, 2010), and one by Li (1988) treating the sufficiency ease of access of hints in L2 reading texts in successful inferencing.

3.7. Approaches to the study of lexical inferencing

Beginning in the 1990, several researches including L2 lexical inferencing were conducted in the context of L2 reading programs. One main area of study emphasized L2 reading comprehension or incidental vocabulary learning while reading. The other had been stimulated by statements sustaining L1 reading as a main factor of vocabulary development throughout education and by associated work on L2 vocabulary learning from reading (Wesche & Paribakht, 2010). These and other reasearches persisting in the beginning of 2001, have scrutinized different features of the lexical inferencing process and its consequences in a variety of contexts (Bengeleil & Paribakht, 2004; Chern, 1993; de Bot et al. 1997; Dubin & Olshtain, 1993; Fraser, 1999; Haynes, 1993; Hulstijn, 1992; Kim, 2003; Mondria & Witt- de Boer, 1991; Mori, 2002; Mrrison, 1996; Nassaji, 2003, 2004; Paribakht & Wesche, 1999; Parry, 1993, 1997; Schuten van Parreren, 1989; Soria, 2001; Wesche & Paribakht, 1998; cited in Wesche & Paribakht, 2010).

Methodologies used in these researches have altered, one main differentiation being between 'naturalistic' researches of lexical inferencing in L2 reading, in which the way readers treated unknown words is registered, and when this included inferencing, how do they deal with it (e.g. Fraser, 1999; Haynes, 1993; Kim, 2003; Paribakht and Wesche, 1999; Parry, 1993, 1997; cited in Wesche & Paribakht, 2010), and those in which researchers 'manipulated' inferencing contexts and made acivities for readers to pay attention to specific words and; in certain situations, to some types of cognitive processing that might enhance their storage of novel lexical knowledge (e.g. Haastrup, 1991; Hulstijn, 1992; Joe, 1995; Wesche & Paribakht, 1998, 2000; cited in Wesche & Paribakht, 2010).

3.8. What Factors Influence Lexical Inferencing and its Outcomes

Study on factors linked to lexical inferencing trials and success are summed up in the following:

3.8.1. Lexical Inferencing Trials

Usually, L2 readers do not try to infer the meaning of unknown words they cross; they have a tendency to disregard several of these words. Yet, whether L2 readers will try to infer or not, a word meaning is affected by many factors; for example; the text's degree of difficulty; the reader's estimate of the word's general significance, or its significance to text comprehension; if it seems easy to guess; and its class; with nouns and verbs being more probably to draw inferencing trials (Wesche & Paribakht, 2010).

3.8.2. Lexical Inferencing Success

When L2 readers try lexical inferencing, success is not guaranteed; learners often fail to make proper meanings. This may, at times, be because of insufficient textual hints;

evident contextual hints are important for word guessability (Wesche & Paribakht, 2010). Moreover, Li (1988) states that, for contextual hints to be useful for inferring word meanings, this information should *"be perceptually and conceptually familiar" (p. 403).*

In Hayne's (1993) research, ESL readers were more successful in guessing meanings for words for which hints were accessible in the word itself or in the close text than those needing attention to more far hints (Hayne, 1993; cited in Wesche & Paribakht, 2010). Many researchers have stated that the largest number of knowledge sources, claimed for both L1 and L2 lexical inferencing, are within the same sentence as the target word or from the word itself (Haastrup, 1991; Paribakht & Tréville, 2007; Paribakht & Wesche, 2006; cited in Wesche & Paribakht, 2010).

3.8.3. Second Language Proficiency

Proof proposing that proficiency makes a difference that is noticed in the difficulties of L2 readers when inferring meanings of unknown words in (texts) in contrast with the proportional success of native language readers in reaching proper meanings for unfamiliar words in L1 texts (Wesche & Paribakht, 2010).

When assessments of general L2 proficiency and reading proficiency are related to successful lexical inferencing, assessment of vocabulary knowledge –themselves so connected with reading and general proficiency- are gradually more viewed as reflecting the most important constituent of L2 proficiency basic for successful lexical inferencing when reading (Wesche & Paribakht, 2010).

3.8. 4. Second Language Vocabulary Knowledge

Study results from different sources show that success in inferring meanings for unfamiliar words when reading relies on learners' capacity to understand the majority of the other words in the text. Measures of the percentage of words that readers should know in a text for the purpose to read the text without help or to infer proper contextual meanings are so high, between 95% of the words in the text assessed in previous researches (Wesche & Paribakht, 2010) and more current researches measuring about 98% (Hazenberg & Hulstijn, 1996; Hu & Nation, 2000; Nation, 2006; cited in Wesche & Paribakht, 2010). Usually, vocabulary assessments considering the breadth of a reader's recognition vocabulary knowledge offer a ground for contrasting individuals' vocabulary knowledge, basic for the reader's capacity to understand the greater number of the words in the text circling unfamiliar words. The main constituents stressed by current scholars involve the enhancement of a constantly more complicated networked-based structure of the lexicon, or what Henriksen (1999) suggested as 'depth' of vocabulary knowledge (Wesche & Paribakht, 2010). Henriksen states that this involved a word's:

> "*sense relations to other words in the vocabulary, such as paradigmatic (antonymy, synonymy, hyponymy,...) and syntagmatic relations (collocational restrictions)...[as well as]...knowledge of the syntagmatic and morphological restrictions and features of a lexical item" (pp. 305*-6*).*

Nassaji (2004) ends up that the learners' larger lexical knowledge may make them more capable to use the accessible hints: *"their richer lexical knowledge may make them better able to make use of the potential cues available in the text and co-text" (p. 117).*

A current Danish research tackled the issue of whether a link could be observed between learners' lexical inferencing processes and success in L2 and their vocabulary knowledge in L2. Both the breadth and the structure of (declarative) L2 lexical knowledge were chosen, the second reflecting lexical network knowledge (Henriksen, 1999; cited in Wesche & Paribakht, 2010) as assessed by a word association activity. The supposition behind involving the network constituent was that a broad and good-organized lexicon works as a significant knowledge base for high-kind lexical inferencing. The findings showed a positive relationship between lexical inferencing success and vocabulary size, asserting previous results that L2 lexical knowledge is truly a great guesser of L2 lexical inferencing success (Wesche & Paribakht, 2010). Moreover, there was a significant result of an association between the assessment of lexical network knowledge and lexical inferencing success, in relation with Nassaji's (2004; as cited in Wesche & Paribakht, 2010) result of an important connection between depth of vocabulary knowledge and lexical inferencing success

3.8.5. Lexicalization Status of Target Words

Two current researches on the effect of L1 'lexicalization (versus non-lexicalization) of target words on L2 lexical inferencing success have showed a big positive influence for lexicalization (Paribakht, 2005; Paribakht & Tréville, 2007; chapter 5; cited in Wesche & Paribakht, 2010). These results offer empirical proof for the significant function of different features of L2 proficiency in lexical inferencing, mainly vocabulary knowledge, and sustain the outlook of lexical inferencing as a meaning building process that is considerably affected by the size of the learner's prior lexical knowledge (Wesche & Paribakht, 2010).

3.8.6. Retention of novel lexical knowledge after inferencing

Research proposes that six to ten meeting with a word usually needed to assure memorization of its meaning (Cobb, 2005; Zahar et al., 2001; cited in Wesche & Paribakht, 2010). As for Sternberg's (1987) perception, the *"facts and framework do not imply...that learning from context is the fastest or more efficient way of learning specific vocabulary" (p. 94).* For example, the scholars ended up that knowledge required from reading pursued by comprehension activities tended to be restricted to word-form awareness or recognition knowledge of novel words; when those including other types of use of words initially met in reading, improved memorization of other features of word knowledge (Wesche & Paribakht, 2010).

Lastly, few researches have showed the usually presumed link between learners' L2 vocabulary knowledge and the following learning of vocabulary via reading (Haynes & Baker, 1993; Parry, 1997; Pulido, 2003; cited in Wesche & Paribakht, 2010), assisting the perception that vocabulary learning via reading –and supposedly the inferencing process that causes it- will be more effective for readers with learners with higher lexical proficiency (Wesche & Paribakht, 2010).

Hulstijn (2001), when stating the disability of cognitive scholars to offer *"adequate theoretical explanations of phenomenon of human learning and memory in terms of quality (type) and quantity (duration and frequency) of information processing" (p. 6)*, notices that more thoughtful processing (pronunciation, orthography, grammatical class, meaning and semantic relations to other words) of novel lexical information will guide to higher memorization than superficial processing (Wesche & Paribakht, 2010).

The majority of inferencing study that has assessed students for memorization has for practical causes been restricted to checking of memorization directly or soon after inferred guesses are conveyed (e.g. Fraser, 1999; Paribakht, 2005; Paribakht & Wesche, 1999; Svensson, 2003; citd in Wesche & Paribakht, 2010). Certain scholars view this as a main restriction; Hulstijn (2001) who stresses that even if there is direct memorization of novel meanings, *"[n]ew information will seldom leave a lasting trace in memory if not frequently reactivated" (p. 286).*

3.9. What Processes Are Involved in Lexical Inferencing and how Have They Been Conceptualized and Explained

3.9.1. Lexically Linked Frameworks

3.9.1.1. Knowledge Sources

When L2 learners meet unfamiliar words, they would often try to find out the meaning by looking for their prior knowledge and information given in the text itself. Many researchers have identified these two knowledge sources that learners use in guessing meaning of unfamiliar words (Yang, 2014).

Carton (1971) distinguishes three major sources of knowledge that foreign language learners might use in lexical inferencing: **contextual, intralingual, and interlingual** (Chavosh & Davoud, 2016). Haastrup (1991, as cited in Akpinar, 2013) uses the same classification. While using *contextual* hints (extralingual or pragmatic hints), learners use their knowledge of the world and the co-text. Knowledge of the world is seen as an element of the language user's and language learners' general socio-cultural knowledge (Chavosh &Davoudi, 2016). It involves factual knowledge, viewpoints, and convictions (Akpinar, 2013). From the other side, the function of co-text has to do with how the understanding of a lexical item is influenced by the particular linguistic context in which it is put. In order that contextual hints can be useful for word inference (Chavosh & Davoudi, 2016), Li (1988) demonstrates that primarily, contextual hints should be common to the reader. Secondly, they must involve the information being in the text to get the associated schemata for the purpose of explaining the subsequent input in the text and notice the uncommon stimuli. In the absence of such hints, inferencing may end in guessing inappropriately. He ends up that lexical guessing is a so hard activity because of the text difficulty or the constraints of the reader, or the two of them.

According to Carton (1971), *Intralingual* knowledge sources are hints based on the learner's knowledge of the target language. For example, learners of English may infer the meaning of words by using their knowledge that suffixes –er and –or convey the idea of procuration (Akpinar, 2013).

The last source of knowledge, *interlingual* knowledge, involves two classifications that are L1 and Ln. In L1, the learner uses his/ her first language while Ln deals with all other languages apart from the learner's L1 and the target language of the experiment (Akpinar, 2013).

It appears that the plan of the text and the use of vocabulary have a role in the success of lexical inferencing. From the other side, factors associated with learners involve learners' background knowledge; prior learning experience; amount of receptive vocabulary knowledge; procedural knowledge; awareness of details in context, involving the capacity and tendency to use the context efficiently; notions about the meaning of the word; the usefulness of prior known information in hint use (Chavosh & Davoudi, 2016).

Moreover, de Bot, Paribakht and Wesche 1997; as cited in Akpinar, 2013) distinguish a group of knowledge sources (used in inferring meanings of unfamiliar words)[connected with the interior organisation of the word]. These sources are: sentence level grammar, morphology, punctuation, world knowledge, discourse and text, homonymy, word associations, and cognates. These knowledge sources generally go with groups of Haastrup's (1991) classification.

Schmitt & McCarthy (1997), from the other hand, identify three types of knowledge sources: *linguistic knowledge, world knowledge, and strategic knowledge.* Linguistic knowledge involves syntactic knowledge, vocabulary knowledge, and word schema. The syntactic structures are thought to give information for learners at whatever phase of language acquisition. World knowledge has to do with the readers' prior knowledge on what a particular word involves. Strategic knowledge is the third type of knowledge that includes conscious control over cognitive resources (Akpinar, 2013).

With regard to Nassaji's (2003; as cited in Akpinar, 2013) classification, there exist four kinds of knowledge sources, mainly: *grammatical knowledge, discourse knowledge, world knowledge, and morphological knowledge*. Grammatical knowledge includes using, for example, grammatical functionsuch as verbs or adjectives. Discourse knowledgehas to do with using knowledge of the links between or within sentences and the connectors between words or sentences (like cause/ effect clues). World knowledge includes using prior schemata to infer the word meaning, while morphological knowledge has to do with the interior hints, like the prefixes.

Scholars who investigate lexical inference using a sole knowledge source do not participate in a successful inference. Nassaji (2003; as cited in Akpinar, 2013) stresses that successful inference relies on the way several types of knowledge sources relate to strategies. His results reveal that success in lexical inference is instantly connected to the efficient use of strategies and the use of several knowledge sources inside and out of the text.

Other studies propose several factors which would participate in a successful lexical inference, like context factors (Diakidoy & Anderson, 1991; Frantzen, 2003; cited in Akpinar, 2013), student factor (Frantzen, 2003; Levine & Reves, 1998; cited in Akpinar, 2013) and text factors (Hu & Nation, 2000; Laufer, 1997; cited in Nassaji, 2003; Shefelbine, 1990; cited in Akpinar, 2013). Hamada's (2009) results show that all the learners made a move from using general to restricted reading strategies, and that even the learners with the most inferior comprehension capacity showed a constant grow in number and diversity of strategies used. Qian (2004) research with a group of university students who had a Korean or Chinese linguistic background found that the top-down method (that will be discussed later on in this chapter) in reading was familiar among the learners tested, and several among them stated that they usually guessed unfamiliar words from context (Hamada, 2009; Qian, 2004; Akpinar, 2013).

Yang (2014), considers that when L2 readers meet unfamiliar words, they would often try to find out the meaning by looking for their prior knowledge and information given in the text itself. In the following we will explain the two categories of knowledge use:

Learners Prior Knowledge

Scholars have numerous outlooks with regard to learners' prior knowledge depending on their researches' objectives. Nagy (1997; as cited in Yang, 2014) groups learners' knowledge into three major kinds: linguistic knowledge that learners master about the linguistic context in which the word has appeared, involving their syntactic knowledge, lexical knowledge, and knowledge of word schema; world knowledge is the learners' understanding and use of the related fields of knowledge; and strategic knowledge has to do with strategies learners use throughout inferring and trying to deduce the meaning of unfamiliar word from context. Rapaport (2007) defines reader's prior knowledge as: *"the knowledge that the readers have when s/ he begins to read the text and is able to recall as needed while reading" (p. 3).*

Being concerned about learners' grammatical knowledge, Kaivanpanah and Alvi (2007; as cited in Yang, 2014) include a think-aloud data to investigate the function of grammatical knowledge in the meaning inferring of unfamiliar words, including non-native speakers undergraduate learners of English studying in different fields. The think-aloud showed that the L2 learners use L2 linguistic knowledge (sentence level grammatical knowledge, word morphology, taking into account class member, examining the compound words into their components, sentence level semantic hints, discourse/ text, homonymy/ phonetics relationship, and collocation) besides non-linguistic knowledge (logic, knowledge of the world, prior knowledge, and knowledge of the subject) to infer the meaning when meeting an unfamiliar word. Despite the fact that Kaivanpanah et al. Concentrated on learners' grammatical knowledge, they have obtained that learners used other sources of knowledge too.

Text-provided clue

One source of knowledge learners use to guess word meaning is from the passage in which the unfamiliar word appeared. 'Contextual clues', 'contextual cues', or 'context cues', etc. were often used (Yang, 2014).

To reach out the particular influences of context clues in contextual guessing, Yang (2009) scrutinizes sixty five first year learners in Northwest University from China using two different yet associated word guessing tests. Every test consists of forty two separate sentences with a target word underlined in everyone of them. The findings showed that context hints considerably influences the result of contextual guessing (Yang, 2014).

Zaid (2009; as cited in Yang, 2014) used two methods in vocabulary teaching: non-contextual vocabulary mode (where every word is introduced with its definition or Arabic corresponding word), and context vocabulary mode where students were trained on a metacognitive strategy of inferencing and guessing the meanings of unknown lexical items. Thirty four EFL level-3 college students contributed to the study. They were divided into two groups where each group was assigned to a one of the two vocabulary modes. Sixty words were selected and arranged into twelve sets of five words for each. Everyone was included in two sentences. The findings showed that decontextualized learners' training develops the mental lexicon by adding more novel words to students' list, while the contextualized word training improves students capacity to learn novel words separately.

Moreover, regardless of the usefulness of guessing meaning of unfamiliar words from the context, inferencing and meaning guessing is much based on student's lexical knowledge and efficient schema-stirring. Clearly, learners' prior knowledge and background knowledge were also used.

In addition to the two previous knowledge sources that learners use while reading, Yang suggested that L2 readers would incorporate information they learned in the text to a novel shape of background knowledge for them to read the upcoming text besides guessing the meaning of the upcoming met unfamiliar words. So, a third type of knowledge different from learners' word-meaning inference was internalized background knowledge (yang, 2014).

Internalized Background Knowledge (schemata)

With regard to the differentiation between learners' prior knowledge and established knowledge, Urguhart and Weir (1998) state: *"... that background knowledge is often not specified in sufficient detail to enable the presuppositions to be examined" (p.69).* Moreover, they claim that *"…that information supplied to readers shortly before they read a text is likely to play a different part in reading from that played by longer established knowledge" (p.69).*

In the process of reading, learners progressively assimilate the information that the text offers and make a novel form of knowledge for them to guess the meaning of unfamiliar word in the upcoming reading. This type of knowledge is not related to the learners' prior knowledge they have before reading the text. From the other side, it does not stand for instant textual hints nearby the unfamiliar word. Learners use information they obtained in earlier reading to do the guessing. It is something other than learners' previous knowledge and textual hints (Yang, 2014).

In addition to that, researches contrasting groups of L2 readers with different native languages show that the L1 may influence models of use of specific knowledge sources. For example, Persian speakers do not often use *word* hints in L1 lexical inferencing, while French L1 speakers do, a difference that continues in English (L2). Generally, it seems that meaning-oriented hints in the same sentence as the target word are of major significance, proposing that the direct semantic context of an unknown word is the former spot both L1 and L2 readers search for information about unknown words. Moreover, some persons reveal personal patterns of knowledge source use, possibly reflecting their own linguistic and pedagogical histories (Wesche & Paribakht, 2010).

3.9.1.2. Lemma Construction

The *Lemma*, which assigns a word's semantic and syntactic information, is of specific advantage as a framework for the scrutiny of knowledge sources in lexical inferencing. In Levelet's pattern for reading (and listening), the process starts with the lexeme, which may stimulate a lemma in the reader's (listener's) mental lexicon (Wesche & Paribakht, 2010). De Bot, Paribakht, & Wesche (1997) claim that the reader's first notice of the form of unknown word may guide to generating of an *"empty knowledge structure and a new lemma" (p. 317).*Lexical inferencing within this framework can be seen as the process of trying to plug this knowledge structure for a novel word or meaning for a familiar word. Recognizing lemma information includes exploring and using several knowledge sources from textual hints and prior knowledge, guided by characteristics of the word information constituents of the mental lexicon. The lemma seeking may stimulate a lemma present in the reader's L1, L2 (or Ln) mental lexicon that he/ she may link to the novel lexeme, like that of a close L2 synonym or a supposed lexical corresponding in the learner's L1or another familiar language.Hence, even a slightlyproper lemma will ease comprehension. In case the word has no lexical correspondence in the learner's L1 or other learned languages, the process is inevitably more one of building from present concepts than recognition, and as for proof of *lexicalization hypothesis*, the word is not likely to be successfully understood, or at best, just some elements of its meaning will be recognized in a first lemma building process (Wesche & Paribakht, 2010).

The lexeme/ lemma difference help illustrate the relationship between the readers view of the novel word form (its orthographic and morphological aspects) and comprehension of a novel word's meaning via inferencing (Wesche & Paribakht, 2010).

3.9.1.3. Connectionism

Connectionism is a current broadly taken demonstration of the basic cognitive mechanism causing the accessing and development of knowledge. In connectionist models, access to knowledge includes parallel stimulation by different processors as knowledge of a word is represented in a dispensed means, available as models of stimulation at the level of sub-lexical aspects instead of a united lexical access (Wesche & Paribakht, 2010).

Connectionism offer a strong illustration for some perceptions in L2 reading enhancement, like the long-lasting effect of L1 form-function mapping operations throughout L2 lexical processing (Koda, 2005).

Henriksen (2008), in her research about the way networks may be acquired and stimulated, states:

> *[the] creation of links between the various lexical items is a continuous process of expansion and restructuring as words occur in different contexts and new items are added to the lexical store. Some associative links gain a canonical status (Murphy, 2003), whereas others may be weakened by lack of activation. "…" This is why we [expect to] see a shifting pattern in response behaviour in word association researches. (p. 28)*

3.9.2. Comprehension-oriented Frameworks

3.9.2.1. Reading Theory

General inferencing capacity is seen as important for text comprehension and the reading process. From this perspective, lexical inferencing is seen as a secondary class of text inferencing. Haastrup (1991) identifies two macro kinds of processing: **holistic processing**, based particularly on contextual hints, and *analytic processing* that involves the activation of linguistic word level hints. For the second macro kinds, she initiated a processing framework involving seven processing kinds, with the higher level kinds linked to processing that needed contact and incorporation between contextual and, where accessible, linguistic hints to meaning. Such processing is called: **interactional processing**.

Proficient learners used a lot larger list of possibly successful processing kinds, involving interactional processing; besides these learners were capable to adjust their processing depending on the kind of word and accessible hints (flexibility in processing) (Wesche & Paribakht, 2010). Hence, Haastrup (1991) results show the value of L2 proficiency and lexical inferencing success.

3.9.2.2. A Cognitive Processing Framework

Huckin and Bloch (1993) introduce cognitive processing framework of their lexical inferencing. It includes two main elements, a **generator/ evaluator constituent** and a **metalinguistic control**. The former involves morphological knowledge and check hypothesis about a word's meaning, when the latter offers a set of procedures to direct the learner's attitude when searching information and making and assessing inference, for example, when and how to look for help from the context or other sources of knowledge. Nassaji (2003) after that uses this framework in a research of intermediate ESL readers with different L1s, scrutinizing their use of particular knowledge sources and cognitive processes in successful lexical inferencing. The research proved learners' use of both procedural and knowledge constituents, ad relationships between these nd lexical inferencing success (Huckin & Bloch, (1993; Nassaji, 2003; cited in Wesche & Paribakht, 2010).

3.9.3. Cognitive Theory in Comprehension and Acquisition Outcomes of Lexical Inferencing

Studies about lexical inferencing have used cognitive theory as it associates both to language comprehension and acquisition. Why is it, for example, that certain unknown words in a text might not be perceived, when others are understood in context via inferencing?. One beneficial viewpoint is input processing (Chaudron, 1985; Faerch & Kasper, 1986; Gass, 1988, 1999; Wesche, 1994; cited in Wesche & Paribakht, 2010). Gass (1988, 1997; as cited in Wesche & Paribakht, 2010) input processing framework offers a practical viewpoint of lexical acquisition. This framework has shown beneficial in setting the lexical inferencing process in association to word and text comprehension. As used in word learning via reading, the framework follows learners 'input processing' from first *apperception* (remarking) of a novel word form in the L2 information they read and its link with prior knowledge, via the *comprehension* of a meaning for it in the context (a process that may include lexical inferencing), to *intake/ assimilation* of some mental representation of the word form and its related meaning (as restricted by the type of analysis throughout elementary comprehension), to the potential *integration* of all or piece of this representation into prior knowledge structures. Ultimate internalized accessibility of the novel knowledge representation for retrieval and productive use by the learner may itself help in the transformation of more comprehended information to assimilate.

In inferencing, successful comprehension of a proper word meaning in context is not to be presumed, and besides capacity factors, contextual assistance and activity requirements, will be intervened by person dissimilarities in the effort that learners are ready to increase in making and checking potential meanings. The inferencing process may end at comprehension without directing noticeable learning consequences. It may, yet, cause brief or fractional memorization of novel associations for a known word or of a novel word form or meaning as an essential phase in the complex and gradual process of learning a novel word (Wesche & Paribakht, 2010).

There is a large support of the outlook that the assimilation and incorporation of novel lexical knowledge relies on the quantity and quality of cognitive processing it goes through over primary and successive exposures, as summed up by Hulstijn (2001):

> *It is the quality and frequency of the information processing activities (i.e. elaboration on aspects of a word's form and meaning, plus rehearsal) which determine retention of new information, far more than the question of whether they process lexical information without with or the intention to commit it to memory" (p. 275).*

Throughout frequent experiences with the word including assimilation and incorporation of novel lexical knowledge, the learner builds on a growing detailed mental representation of the word's phonological and orthographic form, its meaning (s), its syntactic limitations, its network associations, and other types of knowledge about it, and a gradually easy access to it in comprehension and production (Wesche & Paribakht, 2010). Henriksen (1999) states:

> *Acquiring word meaning involves...two interrelated processes of 1) adding to the lexical store via a process of labeling and packaging (i.e. creating extensional links) and 2) recording or changing the lexical store via a process of network building...there has...been a tendency in L2 vocabulary acquisition research to focus on the first aspect (i.e., mapping meaning onto form) and to disregard the second aspect (i.e., network building)(p. 309)*

Lately, the concept of vocabulary network knowledge and very linked structures, like structural knowledge and depth of vocabulary knowledge, have shown important in lexical studies and have improved our understanding of the mental lexicon and how it grows (Wesche & Paribakht, 2010).

3.10. Lexical Inferencing in First Language

3.10.1. The development of Inference Making

One factor that may restrict the scope of making inferences is memory; as inferences usually need that we recall significant facts from various sections of the text. When children listen to extended text, their capacity of inferring is a lot less. A research that illustrated this involved children aged from 6 to 15 years old. When children had questions after every paragraph in the story, the 6 years old replied just to one third of the questions using essential inferences accurately and even the children, more advanced in age, did not reach 100% correctness on the inference question. One factor that explicated children's inference making capacity was their capacity to recall other facts in the text: children who were better at remembering clearly certain details in the text made more important essential inferences (Oakhill, Cain, & Elbro,, 2015).

Researches findings say three significant things about factors that affect children's inference making capacity. Primarily, persons more probably make an inference from a concise than an extended text. Secondly, when young children do not infer, it may be for the reason that they have forgotten crucial details in the text. So, in case the child could not make an inference, it is a good idea to make sure that they can recall the details in the text that sustain the making of that inference. Thirdly, inference and memory are connected: children who are good at inferring are good at recalling other details from the text too. This is possibly since those children build more appropriate and coherent mental patterns of texts. Because of that, it is an interesting idea to measure memory for the significant facts of the text and child's inference making capacities (Oakhill et al., 2015).

Another factor that might affect inference making is knowledge; vocabulary knowledge and prior knowledge connection to the topic of the text, as various inferences depend on vocabulary or prior knowledge. For example, taking the sentence *'Peter picked up the bucket and spade. He put the toys in his bag',*the reader has to know that a child specifically plays with a bucket and spade at the beach and that bucket and spade are playthings. So, it might be that younger children make little inferences than older children as they have modest vocabulary size in comparison with older ones. The way by which vocabulary knowledge can sustain inferences can be explained via the example of depth of knowledge about the *platypus.* If thereader faces this text: *'The platypus was reluctant to move. She was curled round the eggs protectively'*, different processes might be used relying on the reader's knowledge. In case the reader does not know that platypuses are mammals, they will perhaps presume that the platypus is circled around her eggs, and will associate the sentences without problem. In case they know that the platypus is an egg-laying mammal, they won't have a problem either. Yet, in case the reader has certain knowledge about the platypus (a mammal) though does not know that it is an egg-laying mammal so, if they are checking their comprehension and vigorously attempting to associate the sentences, they will face a problem –"egg" does not match with their (restricted) knowledge of "platypus" and they have a comprehension problem to work out. In this situation, the reader might do one of the two things to work out the perceptible contradiction –they may infer that, opposing to what they thought, the platypus puts eggs (and is whether not a mammal, or a weird one) or they might think that the eggs the platypus is circled around are not, truly, her own eggs, yet may be obtained from a bird's nest, that she meant to eat. So, not just the recognition, yet the decision, on contradictions will, in certain situations as a minimum, highly rely on previous knowledge. Lastly, the reader might be directed to make an inference, which after that seems to be wrong, therefore, his/ her mental pattern, has to be reviewed (Oakhill et al., 2015).

3.10.2. Difficulties with Inference Making: Who Has Difficulties with Inference Making and Why?

There is a huge proof that children with reading comprehension problems do not create as several inferences as their friends; the result of successful comprehension consists of a mental pattern which is a representation of a text's meaning, in which information from different sections of the text is united and associated with appropriate prior knowledge. Weak comprehenders are less prone to get involved in another kind of inference that is essential to make a consistent mental pattern. An inference consists of going further the information given explicitly in the text. At times, significant facts like a character's age are not said explicitly, yet there are powerful signals given in the text. In the example, *'Peter played all day with a bucket and spade',* a possible inference is that Peter played at the beach the whole day, yet the text does not tell this. Weak comprehenders are less prone to infer this way than good comprehenders (Cain & Oakhill, 1999, cited in Oakhill et al., 2015).

Hence, why do children with weak comprehension make little inference? Three vital sources are to be taken into account: *memory, knowledge, and readers norms of coherence* (Oakhill et al., 2015).

3.10.2.1. Memory

Children with weak comprehension have weak performance on memory activities that goes further recalling lists of words or numbers; their capacity to process information when memorizing earlier heard or read knowledge is poor. It is simple to understand the way this kind of memory sustain inference making when the reader (or listener) is attempting to relate information between different sentences in a text and / or include prior knowledge to interpret implied information (Oakhill et al., 2015).

Certain inferences are complicated since they cover a big deal of texts. The reader will have to save in mind what was read earlier so that to make an inference. Yet, previous input might be forgotten. So memory requirements are a significant factor in inference making, obviously, separate assessment of memory convey inference making capacity mainly for proficient readers (Oakhill et al., 2015).

Inference making can be developed through different ways that sustain the building of mental patterns of the text contents to aid to lower the influences of weak memory. First, vocabulary and background knowledge are significant for inference making. Even very easy inferences can be made in case the reader has the necessary background knowledge. Yet, developmental researches have shown that the rapidity of knowledge stimulation is crucial in clarifying differences associated with age: older readers think of related information more rapidly than younger readers. How do knowledge and access to that knowledge connect with weak comprehenders' inference making complexities? (Oakhill et al. 2015).

3.10.2.2. Vocabulary and Backgorund Knowledge

Like younger readers, weak comprehenders also may be slow at thinking of related knowledge to be capable to make use of this knowledge when reading: rapid and appropriate access to the significance of words and background knowledge is needed if it is going to be accessible to be used throughout comprehension. There is proof that weak comprehenders are possibly less prone to simulate other words. For example, 'bed' and 'dream' are related to *sleep*, so they can quickly be stimulated via reading about a sleeping person. Yet, this knowledge is well founded even in young readers; children with weak reading comprehension are less possibly prone to automatically make the link. It might be that while processing text, weak comprehenders, particularly, stimulate a restricted meaning of a provided word and hence do not have further traits of that word and associates of the word that can be quickly accessible. This proposes that certain factors that affect inference making are not automatically under conscious command. Moreover, it proposes that weak comprehenders may require working more consciously with connections with basic key vocabulary in the texts before and through reading (Oakhill et al., 2015).

Inference making capacity does not just work for reading comprehension; it is basic for vocabulary acquisition too. The research on making inferences image books discovered that inference making capacities when children were 4 years old told about their vocabulary knowledge one year after (Oakhill et al., 2015).

3.10.2.3. Standard for coherence

is another factor that might affect how easily a reader generates an inference in their *standard for coherence*. Surely, when adults need to read to investigate for a text, they make more inferences than when needed to read for pleasure (Oakhill et al., 2015).

Hence, it appears that, there are, as a minimum, three causes why inference might be difficult for certain children: weak memory, access to knowledge, and how capable a reader is to put proper criteria of coherence for reading (Oakhill et al., 2015).

3.10.3. How can inference making ability be improved?

Since there are various inferences that can be made for any text, there are various didactic methods. Some have stressed the idea that weak comprehenders miss an *awareness of when inferences are needed*and the way to make those inferences. For example, one method is to explain to children how to analyze the text for hints. Using sentences like '*Sleepy Jack was late for school again'*, children can take single words and investigate what information everyone gives, under teacher instructions. In this example, *sleepy* proposes that that person have slept in, hence offering a cause for not being at time for school. Jack associated with school proposes that he is a schoolboy and not a teacher who would most likely be presented as Mr. X, and *again* shows that this has occurred previously –This kind of training has been given by researchers to children and helped for inference making and further comprehension abilities (Oakhill et al., 2015).

Techniques also involved tutoring in questions to improve inference making, like *who, what, where,* and *why*; wh- questions. In today's classroom, teachers used, besides one of the questioning methods, a general questioning method in which each five to six questions, students were questioned about the way the sentence they just read relate to something that occurred previously in the story. Every technique has profits in understanding, proposing that a group of questions can be used to get students' thinking about text and making inferences (Oakhill, et al., 2015).

According to the incidental method, there are so numerous words to teach via direct tutoring, and students can simply learn words from context after they have learned to read. As they are at high-school, students learn most of these novel words from text (Prior, Goldina, Shany, Geva, & Katzir, 2014), without the aid of proper definitions, overt clarification, or teaching. Many researches have demonstrated that children acquire knowledge of novel vocabulary via exposure while reading (Nagy, Anderson, & Herman, 1987; cited in Prior et al., 2014), with a number of 100 unknown words met in one reading, a reader may remember 3-15 (Prior et al., 2014).

The majority of the researches on inferring novel words from context in L1 have been carried out on elementary school where the children's lexical inference capacity has been associated to strong comprehension skills (Cain et al; 2003; Nicholson & White, 1992; Swanborn & de Glopper, 1999; cited in Prior et al., 2014), and to prior vocabulary knowledge (Prior et al., 2014).

3.11. Second Language Inferring Word Meaning from Context

Informed lexical guessing, or inferencing, is usually thought of as familiar and helpful methods to text processing in L2 reading. Relying on the findings of a research with 1067 ESL learners in Hong Kong, Fan (2003) states that lexical guessing was among the most usually used strategies by post-secondary learners of English there. Moreover, in a study with about 850 university level ESL learners, Gu and Johnson (1996) reach the conclusion that contextual guessing of unfamiliar words was a familiar strategy, which frequency of use strongly correlated with language competency (Fan, 2003; Gu & Johnson, 1996; cited in Bogaards & Laufer, 2004).

Learners usually classify lexical inferencing as a helpful strategy and research has demonstrated that it is one of the most familiar and favourite strategies for learners when treating unknown words in reading. Patribakht and Wesche (1999) demonstrate that their university ESL students used inferencing in about 78% when attempting to recognize the meaning of unfamiliar words, where Fraser's (1999) students used inferencing at 58%. Unluckily, this does not signify that it is inevitably efficient. Nassaji (2003) demonstrate that of 199, learners just made 51 (25, 6%) that were useful, and other 37 (18,6%) that were slightly useful. This goes with the 24% percentage that Bensoussan and Laufer's (1984) learners reached. Walters (2006) gets that learners of different competencies appear to profit from different methods; while beginners profit most from instruction in a general inferencing operation, more proficient learners profit more from instruction in the identification and interpretation of context hints. Moreover, she demonstrates that instruction in inferencing may do more to enhance reading comprehension than the capacity to infer word meaning from context (Bensoussan & Laufer, 1984; Fraser, 1999; Nassaji, 2003; Walters, 2006; cited in Schmitt, 2010).

Like incidental learning, the first thing the learner concentrates on is understanding written or spoken discourse. There is a metacognitive strategy of assessing the importance of attempting to find out the meaning of the unknown lexical item. The learner may reach for it in the dictionary or solicit illustration, yet the most important strategy is inferring the meaning from information in the text itself. Inferencing is a wanted strategy as it includes more profound processing that is supposed to play a part in better comprehension of the text and in some learning of the lexical item (Read, 2000).

There is a set of researches since 1940s that started to distinguish and categorize the contextual hints that can sustain first and second language readers to make inferences about unfamiliar words. In the L1, one significant structure is that made by Sternberg and Powell, 1983; as cited in Read, 2000). They suggested a theory of learning from context that differentiates between the external and internal context of the unfamiliar word. In their example, 'at dawn, the blue rose on the horizon shone brightly', we can notice that 'at dawn' gives a hint of time, 'arose' and 'shone brightly' offers functional hints and 'on the horizon' gives a locative hint. They name a sum of eight (8) hint kinds. From the other side, the internal context is about the morphology of the word: prefix, stem, and suffix.

One significant element of Sternberg and Powell's theory is that, for every type of context, there is a group of intervening variable which decides on the extent of efficiency at which the reader can benefit from the hints obtained. In external context, an unfamiliar word is more probably guessable if it appears several times in different contexts in the text, in case it is obviously a crucial word to be understood and if the context gives numerous helpful hints (Read, 2000).

When it comes to second language reading (e.g. Carton, 1971; honeyfield, 1977; Nation and Coady, 1988), most of the variables relevant to L1 readers apply to L2 readers too. One variable that is particularly relevant to L2 readers is the degree of competency in the language. In case the reader has restricted knowledge of the target language vocabulary, he/ she will face a huge number of unfamiliar words. Therefore, the reader will not be capable of making contextual hints in the text because the words which give such hints for a specific target word are themselves unfamiliar. Laufer (1992, 1997) states that second language readers of English are required to have a minimum of 3000 word families to have certain knowledge of 95% of the words in the text. This way, the concentration of unfamiliar words lessens to 1 in 20 (Carton, 1971; honeyfield, 1977; Laufer 1992-1997; Nation & Coady, 1988; cited in Read, 2000).

Writers on lexical inferencing usually give the impression that, with such a broad scope of contextual hints available, each unfamiliar word will have certain hints, if just the reader learns the way to reach and understand them. This positive viewpoint is strengthened by practice, in investigation and in course books for learners, of exhibiting target words in contexts which have been selected, written to give hints for the purpose of giving the learners a good opportunity of guessing the words effectively. This method might be acceptable if the main aim is to teach in the strategy of inferencing and to persuade them it is worthy to use the strategy to their own reading (Read, 2000). Yet, the findings of certain studies propose vigilance; in their study of lexical guessing by students learning English as a foreign language at a university in Israel, Bensoussan and Laufer (1984; as cited in Read, 2000) chose 70 target words from an edited text of about 600 words. When the examiners themselves analyzed the context for every target word, they found that there were no contextual hints for 29 (41%) of them, when just 13 (19%) of the rest ones could be said to be obviously cued by the text.

Another proof comes from two experiments by Schatz and Baldwin (1986; as cited in Read, 2000) including American senior high-school students in Florida. The investigators arbitrarily chose paragraphs including low-frequency words from novels, textbooks, and periodicals, and assessed the students' understanding of the words through MCQ items in experiment 1) and a definition writing task (experiment 2). They reached the conclusion that students who were offered the words in context do as the control group who answered to the separate words. Schatz and Baldwin limited the context in their test items to the sentence including the target word in addition to two side ones. However, the main idea is that we should not presume that the context unavoidably facilitates understanding the meaning of words unknown to the readers.

An important other question about lexical guessing is about how effective learners are if they have not been particularly trained to do it. Many studies (Bensoussan & Laufer, 1984; Haynes, 1984; Laufer & Sim, 1985; cited in Read, 2000) have put a guessing activity that learners answered in writing and analysed the appropriateness of the guesses. Results have shown that learners quite usually make incorrect guesses that are the consequence of providing the wrong sense of a word that has various senses, mistake the target word with another alike form or sound ('uniquely' interpreted as ' unequally'), etc. Globally, learners seem to guess on certain restricted grounds. Liu and Nation (1985; as cited in Read, 2000) report that the majority of learners would require a significant exercise in class, with the assistance of the teacher, before being capable to guess effectively when reading alone.

Other researchers have concentrated on the processes that foreign language learners use when attempting to infer the meanings of unfamiliar words in a text. Van Parrenren and Schouten- Van Parrenren (1981; as cited in Read, 2000) inquires Dutch learners of several foreign languages to think-aloud in dutch when they tackle unknown words in a reading article. The authors distinguish four linguistic degrees at which the learners could function: syntactic (structure of the sentence), semantic (meaning in the instant and broader context of the word), lexical (form of the word), stylistic (the precise using of this word in this context). They reach the conclusion that the degrees were arranged from syntactic to stylistic as the highest. This means that learners could not work at a higher level if lower level skills were missing.

One more research process embraced by Haastrup (1987, 1991) and Schouten- Van Parrenren (1992), is to make groups of two of learners associated depending on their competency level in the foreign language. They worked jointly to infer the meanings of unfamiliar words, hence they made reflective think-aloud reports of their reasoning processes. Haastrup, whose participants were Danish –secondary students learning English, analysed the hints they used into three classes: interlingual (using L1 and languages apart from English),

-intralingual (using knowledge of English), and contextual: using content of the text and knowledge of the world. The results show that the less able learners generally had more restricted source of knowledge to use and more complexity in incorporating information from several sources. So, the proof is that lexical guessing is not a simple activity to perform, even if contextual information is easily accessible. Learners can deviate through inferences that are founded on limited knowledge and by their failure to verify their initial guesses in comparison with the broader context of the text (Haastrup, 1987-1991; Parrenren, 1992; cited in Read, 2000).

Getting the proof that many learners miss the skill to infer the meaning of unfamiliar words appropriately, there have been few studies on whether they can be effectively trained to use it in their reading. Van Parreren and Schouten-Van Parreren (1981; as cited in Read, 2000) mention a small number of experiments illustrating that the guessing skill is trainable. It is obvious that strategy training is a difficult task and experts in this field might not have yet understood how to improve the learning strategies of specific groups of students in the most efficient means.

A last, even if the learners effectively infer the meaning of an unfamiliar word in a reading text, this does not mean that they will automatically acquire knowledge of the word. One can find out what a word signifies for instant comprehension aims yet is not able to store its meaning or form in long-term memory after the reading activity is over. Research of Mondria and Wit-De Boer (1991; as cited in Read, 2000) who test Schouten-Van Parreren's theory, that guessing the meaning of words in context (mainly 'pregnant' one giving several hints) is a useful strategy for vocabulary learning (the theory claims that the cognitive processing created by guessing would generate effective connections for the word), with Dutch learners of French proposes that having contextual hints accessible (using pregnant context like: the gardener filled a watering can to water the plants, instead of: I am looking for a watering can so I can finish my work) facilitates the lexical guessing of the word's meaning, however; the research has demonstrated that when the students were tested for their memorization of the word meaning two or three days afterwards, the model was inverted; it was the learners who had the non-pregnant phrases who retained the words better. The scholars illustrated their results by proposing that having accessible contextual hints does not encourage the students to put effort into making a mental connection between the word-form and its meaning.

Recent studies on lexical inferencing in the L2 have stressed various features of the process. Primarily, it has been shown that L2 readers do not try to guess the meaning of unknown items all the time (e.g. Bensoussan & Laufer, 1984; Parry, 1993), mainly if they think the word does not have vital significance for text comprehension. Other studies have shown that the capacity to make a successful guess is very changeable (Haastrup, 1991; Paribakht & Wesche, 1999; cited in Prior et al., 2014). Truly, readers mainly depend on meaning hints that are whether an element of the word itself or that take place in the instant context, mainly in the same sentence. These processes are comparable to features of lexical inferencing in L1 (Prior et al., 2014).

It is logical to presume that an important part of vocabulary learning in L2 happens incidentally from reading new words in context, outlooks are yet split on this question. Particularly, the effectiveness of incidental vocabulary learning and lexical inference from reading in L2 is yet at the heart of investigation (Prior et al., 2014).

There is a significant inconsistency in researches in the revealed ability of L2 readers to infer the meaning of unknown words from text, even in case the related context sustains those inferences (Bensoussan & Laufer, 1984; Haynes, 1993; Haynes & Baker, 1993; Huckin & Bloch, 1993; Knight, 1994; Pulido, 2007; cited in Prior et al., 2014).

A significant factor participating in the capacity to infer the meaning of words from written context for L2 learners is competency in the language. This concept has been examined in several means, for example by comparing learners at different grades of L2 acquisition (e.g. Haastrup, 1991) or by assessing the function of personal differences in L2 competency in expecting successful inferencing (e.g. Pulido, 2007). The general outcome is that with growing competency in the L2, learners turn out to be more proficient at lexical inferencing from context (yet Bensoussan & Laufer, 1984, had different outcome). But the concept of competency is intricate, and may involve various main language skills besides vocabulary and morphosyntactic knowledge, yet word reading fluency too. The majority of present studies have concentrated on vocabulary knowledge in the L2, yet very few are known about the potential function of other constituents of L2 competency in guessing L2 lexical inferencing from text (Prior et al., 2014).

The function of prior vocabulary knowledge in the L2 in easy successful lexical inferencing was explained by Haynes and Baker (1993; as cited in Prior et al., 2010) who claim that the capacity of native Chinese speakers to successfully infer the meaning of novel words from text in English was more intensely related to their prior English vocabulary knowledge than with their English grammatical knowledge. Likewise, Nassaji (2004) states that depth of vocabulary knowledge in L2 considerably expected the success of ESL learners in making lexical inferences. One illustration for the significant function of vocabulary knowledge in easing lexical inference is that except that a reader is previously familiar, with regard to orthography and semantics, with a superior rate of the words in a text, they might think it is so hard to depend on the context to take out hints to sustain lexical inferencing of unfamiliar vocabulary. It has been proposed that for the purpose to get enough comprehension of a text, L2 learners are required to know between 90% and 95% of tokens. This highlights the idea that improved word reading capacities besides reading comprehension are significant for permitting succeeding lexical inference.

When the function of word level reading has been involved in the L1 literature on lexical inferencing, it was not methodically dealt with in the L2 researches. Perfett's (2007; as cited in Prior et al., 2010) model of automatization in reading proposes that efficacy of separate word reading processes permits distribution of attentional resources to processing textual information, resulting in enhanced reading comprehension. Here, it is proposed that alike processes may lie behind the capacity to infer the meaning of new words from text. Mainly, effective recognition of separate printed words would permit the L2 readers to assign more cognitive resources to higher processing and to successfully infer the meaning of unknown words. Yet, despite the fact that the links between language competency, reading comprehension, vocabulary knowledge, and L2 lexical inferencing have been explained in the past, no researches, up to today, investigated the role of essential reading skills like word deciphering appropriateness and fluency to L2 lexical inferencing.

3.12. L2 Infering and Reading Comprehension: The Top-down Model

The concentration of unknown words in a text usually has a very important function in the success or failure in this kind of guessing. The more significant the concentration of unfamiliar words, the more defying the guessing activity will be. Haastrup (1991) presumes that inferencing at the text level and at the word level display an intimate connection and consequently inferencing can be thought of as a comprehension process. Studies on strategies for lexical guessing has been affected by theoretical patterns of L2 reading, among which top-down models. Because of the impact of these theories, ESL teachers and learners usually consider that lexical inferencing essentially includes top-down processing. In lexical guessing, hints can be accessible at various levels; from lower-level ones, like orthographical, morphological, and phrasal, to mid-level ones like sentential and inter-sentential, and then to more general hints from an entire paragraph or an entire text. Moreover, a part from linguistic hints, those associated with world knowledge are usually helpful (Bogaards & Laufer, 2004).

In a study that has been carried out in Canada on 61 worldwide students who were assisting intensive ESL programmes, aiming at revealing what strategies are familiar with young adult ESL learners encountering unfamiliar words while reading English and whether the top-down method to reading comprehension was truly a vital factor affecting lexical inferencing strategies, the findings show that ESL learners would usually attempt to find out the word meaning by guessing from context (Bogaards & Laufer, 2004). This strategy was considered crucial by learners in Gu and Johnson’s (1996; as cited in Bogaards & Laufer, 2004) earlier study.

With regard to lexical inferencing, the students depended strongly on the direct semantic context (syntagmatic hints) and the forms of unfamiliar words (morphological hints) to get the meaning of the unfamiliar words, yet hints from the general meaning of the text, like word class, and sentence grammar was slightly used. These findings demonstrate that the students' current methods to processing the meaning of a global academic English text were not as top-down as they themselves had thought (Bogaards & Laufer, 2004).

Conclusion

Usually used vocabulary learning strategies appear to be simple memorization, repetition, and taking notes on vocabulary. These more non-reflective strategies are usually preferred over more intricate ones needing important active treatment of information like in the case of inferring (Schmitt, 2000).

L2 readers use a range of knowledge sources to infer the meanings of unknown words (Comer, 2012). These include *contextual cues* (context), *linguistic knowledge* involving: word-level knowledge (like morphology, schema, cognates, associations, etc) and syntactic knowledge (sentence-level knowledge: parts of speech, sentence meaning, sentence syntax, and punctuation). Besides *background knowledge* that includes: prior knowledge about a word, and knowledge of the world (facts, viewpoints, convictions). However, for lexical inference, the role of these knowledge sources at different levels of L2 language proficiency remains an area of ongoing research.

Chapter IV

Methodology

Introduction

This chapter opens with the method used in the research “the before-after design”. It, then, describes “Cloze Procedure” test of language proficiency, which the study chooses as a treatment for the experimental group, to find out the role of inference skill in promoting vocabulary knowledge. The chapter ends up explaining the vocabulary size test’s form, goals, specifications, and how the obtained scores from the test are interpret

4.1. Method

The Before-After research kind of designs (pretest posttest control group design) is used in the study; the testees are randomly assigned to groups (the experimental and the control group). Then, they are pretested on the dependent variable ‘y’. The independent variable, ‘x’, is administered to the experimental group, and the experimental and control groups are posttested on the dependent variable ‘y’. The dissimilarities between the pre- and postscores for the experimental and control group are, after that, tested statistically to measure the influence of the independent variable (Christensen, 1980).

Randomization ensured groups equivalence; where, theoretically, all potential external variables are controlled. Controlled external variables standard is related to *internal validity* which questions if the perceived influences can be referred to the independent variable or not. A control group, which does not undergoes the independent variable, is another way to influence control; it works as a source of comparison that provides a concrete marker that the treatment condition ‘x’ gave, or not, outcomes that would not have been reached without the treatment (Christensen, 1980).

Pretesting is another means to get the latter information. It permits to instantly perceive alteration in the participants’ behaviour caused by the treatment influence. More importantly, there are various reasons for involving pretesting in an experiment like recognizing the presence of a *ceiling effect;* there might be no space for the treatment condition to have an influence when the participants already have positive scores for the independent variable. Again, pretesting ensures participants are similar through the groups pretests mean scores (randomization is not faultless). Another most familiar reason for pretesting is to give proof that the treatment condition did cause a change in the dependent variable (Christensen, 1980) .

The following figure describes this design:

	Preresponse Measure	Treatment	Postresponse Measure		
Experimental Group	y	x	y	Pre y Minus y	
Control compare Group	y		y	Pre y Post y	‘R’

Figure 4: Before-after design. (Adapted from Campbell, D.T. and Stanley, J.C. Experimental and quasi-experimental designs for research. Chicago: Rand McNally and Co., 1963)

(Christensen, 1980).

Hence, and more precisely, the actual experimental design is a **randomized control-group pretest posttest design** (called previously the classic controlled experimental design). The independent variable of the study is lexical inferencing as a verbal reasoning capacity while the dependent variable concerns EFL vocabulary learning.

In addition, the experiment is for independent samples as it employs two groups: the experimental and the control group, in which the former receives the treatment while the latter does not. Moreover, it is a one-tailed test since we have predicted a direction that the treatment will probably have a positive influence on the experimental groups’ receptive vocabulary knowledge.

4.2. Participants

The subjects involved in this study are composed of forty (40) students from an entire population of 270 undergraduate third year students (3rd year) at the University Frère Mentoury/ Constantine 1/ Department of English/ 2014. The students have received formal English instructions for two to three years (2 to 3), and they are supposed to have a basic knowledge of English words and sentences – enough to read simple texts. In the main study, one of the two groups (of 20 students) stands for the experimental group, and the other was the control group. The students are assumed to have the same proficiency level as their distribution into classes is random.

4.3. Material

4.3.1. Cloze Procedure Format Activities

4.3.1.1. Introduction

Rye (1982) states that the term 'cloze procedure' was first put by Wilson Taylor in 1953. He demonstrates that the term 'cloze' comes from the Gestalt psychology notion of 'closure'. It describes a human tendency to fill up a usual paradigm. Urquhart and Weir (1998) illustrate that it is related to the tendency of persons to filling up a pattern once they have understood it globally. Rye (1982) demonstrates that it is a cognitive activity based on using contextual clues to fill the blanks:

> *Cloze procedure is essentially a cognitive task. The reader has to reason and construct suggestions to fill the gap on the basis of the evidence derived from the context. … the completion of meaning, based on understanding and reasoning, is a cognitive task (p.3).*

Brown (2002) mentions that it is not hard to get people to take a cloze test because of the irresistible human requirement to fill blanks.

In the 1960s, studies concentrated on cloze tests as an assessment of reading comprehension in L1 and L2. During the 1970s, cloze tests started to be used as an assessment of global L2 proficiency (Ahluwalia, 1992). Today, cloze tests are largely used in certain places (like China) and as part of certain wider scope language tests (like the test of English as a foreign language TOEFL). Besides, the cloze procedure may be adjusted and used for several objectives. To teach vocabulary, for example, just the words of the vocabulary lesson can be omitted. In other scopes, like social researches, technical words can be omitted (Lerner & Johns, 2015).

A typical cloze test is a passage with gaps of average length substituting some omitted words that students are needed to finish up using the right words or their synonyms. During classical cloze testing, each 50 word is taken out from a 250-500 word reading passage, and is substituted by a standard-length gap room (Helfeldt et al., 1986). Several researches demonstrated that the reliability and the validity of cloze tests are influenced by factors like the rate of omission, nature of the text, scoring systems, etc. (Lu, 2006). As Steinman (2002) demonstrates, there are two options in setting a cloze test according to its omission rate: a random cloze or a rational cloze. A random cloze deletes every determined number of words, so that the different words have the same chance of being omitted. A rational cloze is the one in which particular type of words is omitted according to a linguistic rule, like nouns, verbs, adjectives, etc.

Alderson (2000; as cited in Yamashita, 2003) distinguishes between these two types of designs by naming the rational cloze ‘gap-filling tests’ and limiting the term ‘cloze’ to the random cloze. Ahluwalia (1992) states that omission rates would produce either mounting difficulty of the text or dissimilar difficulties. Another factor that would influence the reliability and the validity of the cloze is the nature of the text (familiarity and difficulty level).

However, Alderson (1980, 1983) and Yamashita (2003) claim that cloze test performance is not instantly linked to the difficulty level of the text; it includes other factors like content familiarity for the readers and scoring procedures ('exact word method' needs the examinee to give the original word omitted from the text, and 'contextually acceptable word method' that permits synonyms of the deleted word, or semantically acceptable words (Alderson, 1980-1983 & Yamashita, 2003; cited in Yamashita, 2003).

4.3.1.2. The Role of Cloze procedures in English Teaching

Cloze procedure has been initially used as tool for measuring the readability of writtenmaterials for school children in the United States Then it is used in teaching for numerous objectives. Among the main objectives used for using cloze procedure in English teaching are readability (assesses the difficulty of textbooks), language proficiency (language skills), and language teaching tool (to enhance the learners' language learning capacities) (Brown, 2002). In the following, more focus is put on language proficiency and cloze procedure as a teaching tool:

4.3.1.2.1. Cloze procedure as a test of language proficiency

It seems that a huge scope of skills like vocabulary, grammar, structure, and reading skills are included in the process of completing a cloze procedure. Many researchers reveal that cloze procedure is a good test of global English language proficiency. Cloze procedure assesses overall language proficiency involving linguistic knowledge, textual knowledge, and knowledge of the world, since it requires the testee to use knowledge like vocabulary, grammar, the reader's background knowledge, etc (Lu, 2006). Scholars like Rashid (2001) found that cloze tests are reliable for assessing the language competence of ESL students. Chinese researchers (Bai, 2004; Li, 2004; Tao, 2004; Zhu, 2004; cited in Lu, 2006) identified cloze procedures as very effective instruments of assessing integrative English language proficiency. The 'Integrative language competence' includes the skills of thinking, speaking, reading, understanding and writing.

Urquhart and Weir (1998) question the reliability and validity of cloze as a tool for measuring overall comprehension of a text, since cloze procedures omit words, instead of phrases or clauses that do not generally carry textual cohesion and discourse coherence and hence center readers' attention on individual words to the detriment of general understanding.

4.3.1.2.2. Cloze procedure as teaching instrument

This is a successful teaching device, for a lot of scholars, to aid enhance

learners' language capacity. Helfeldt, Henk and Fotos (1986) claim cloze procedure as 'passage-completion' is a technique to determine learners' scholastic reading level, which permits teachers to assist the learners more correctly. Lombard (1990) demonstrates, using cloze tests in her English second language classes, the way cloze tests aid solve reading problems of learners and raise their confidence. Steinman (2002) considers her use of cloze procedure as a teaching tool for learners to practise using context clues as a reading strategy and to encourage vocabulary development in teaching.

4.3.1.3. The link between cloze procedure and reading

4.3.1.3.1. Reading

Dreyer (1998) claims that reading is the most crucial skill for second language learners in educational contexts.At the intermediate and advanced levels, Cooper (1986), and Clarke and Silberstein (1987) mention that reading comprehension includes a huge number of reading skills. These skills are in the following:

Vocabulary skills

-Use context clues to determine the meaning of an unfamiliar word.

- Use structural analysis (such as prefix, suffix, etc) to determine word meaning – semantic knowledge.

-Use dictionary to determine word meaning.

Reading speeds

-Skimming – read quickly for global comprehension.

-Scanning – read quickly for precise details.
- Reading for comprehensive understanding – develop an overall understanding, identify relevant details, and identify the relationships between ideas.
<u>Skipping unknown words</u>
- Critical reading – make inferences by relating the text to past experiences (background knowledge), ask questions, evaluate and judge the information and the author's opinion.
- Monitoring – make clarification, summary, question, and prediction. Syntax knowledge – structure of the language.Grammar skills Discourse knowledge – cohesion and coherence of the text.
(Lu, 2006).

DeBoer and Dallmann (1960) consider that reading involves two elements. One is the reading process, and the skills required for this process. It encompasses reading skills like skimming, scanning, reading for comprehension, and critical reading; language skills like vocabulary knowledge, syntax knowledge and discourse knowledge, etc. The other is the active role of the readers; it needs learners to use the reading skills consciously and efficiently; for example, use background knowledge to aid comprehension of the topic, use textual cues to assert his/her expectation, various reading skills, particular one or mixture, for various activities, recognize connections between ideas, guessing vocabulary from context, etc. In addition, significant reading relies on learners' smoothness in reading. This is what Merritt (1969) names "Intermediate Skills', the capacity that permits a reader to read fluently (Merritt, 1969; cited in Rye, 1982). Rye (1982) cites that Goodman (1967), and Ryan and Semmel (1969) argue that reading is a psycholinguistic guessing game and a building language process. He demonstrated that the fluent reader is capable of using factors in language that make the coming letters and words guessable. The processes included in fluent reading and in completing cloze omissions are alike. When filling up g a cloze omission, the reader samples the context information, builds an answer and verifies it with the ready context information. Hence, cloze procedure is a means to enhance some reading skills. According to Carrell and Eisterhold (1988), the role of background knowledge in ESL/EFL reading comprehension has been formalized as schema theory. The previously acquired knowledge is named the reader's background knowledge, and prior knowledge structures are named schemata. According to schema theory, comprehending a text is considered as an interactive process between the reader's background knowledge and the text. This process of interpretation can be detached into two main modes: bottom-up and top-down processing (explained earlier). Then, as Carrell and Eisterhold (1988) state *"Reading comprehension depends crucially on the reader's being able to relate information from the text to already existing background knowledge" (p. 82).*

4.3.1.3.2. Cloze procedure as a measure of reading ability

Several scholars found that cloze procedure correlates with other reading tests (Rye, 1982; Steinman, 2002).

4.3.1.3.2.1 Cloze and reading comprehension

The traditional cloze test has enjoyed twenty-five years of use as a measure of reading comprehension ability. Studies have demonstrated that cloze performances are very associated with the performances on other reading comprehension tests (Helfeldt, et al., 1986). According to Rye (1982), the findings of Taylor's (1957) experiment claim that there is 85% interference between the cloze test and the comprehension test.

4.3.1.3.2.2 Cloze procedure and the assessment of reading strategies

As Brown (2002) points out, cloze tests are based on contextualized written language; they need readers' conscious and effective use of reading strategies. Gunning (1998) ends up that cloze is an important teaching technique that boosts reading for meaning and use of context, mainly efficient for students who fail to read for meaning. To properly complete passages, students must have well understood the meaning of the text. Processes included in the use of reading strategies encompass previewing (read the text before starting the cloze test), predicting (activate background knowledge to guess the meaning), using context clues about the omitted words in the context, using language knowledge to select proper lexical items and proper grammar forms for the blank.

4.3.1.3.2.3. Using cloze procedure in the teaching of reading

According to Rye (1982), several scholars have proven the reliability of standardized cloze tests in this regard. He argued that teacher-made cloze tests can also be validly and reliably used in certain ways cases. Rye (1982) states that cloze activities make important development in reading capacity. He mentions Rankin's report (1959, 1969) which demonstrates that there is no prominent different score between Rankin's own cloze tests and standardized reading tests on the same article. Moreover, he argued that cloze procedure also helps in developing the ability to infer implicit meaning from a cloze passage when using group discussion activities.

4.3.1.4. Difficulties students actually have with cloze tests

As Rye (1982) argues, the processes included in reading are in certain sorts linked to the processes involved in completing cloze omissions. The obstacles the students have in cloze may be the reflection of their obstacles in reading. Edwards (1978) recognizes several zones of reading failure, among them: incapacity to use context clues, unsuitable comprehension skills, and ineffective rates of reading (Edwards, 1978; cited in Rye, 1982). Yet, certain reading skills, like using a dictionary, are not accessible to the readers during cloze tests; so a more flexible use of reading strategies is required to fill in a cloze. It is useful to search obstacles students have with cloze tests. The first obstacle students have with cloze tests may be their ineffective reading rates. Rye (1982) reveals that fluency in reading is crucial through the process of filling up a cloze test. Students, initially are required to skim the text to get a general comprehension is before concentrating on the omissions to help them fill in the cloze omissions. Yet, the students may fail to read fluently and quickly. Their fluency may be prevented because of so many unfamiliar words. The students may spend a lot of time on the difficult words instead of using the context to find out their meanings. Consequently, the students' reading decelerates. The second difficulty may be the learners' inappropriate reading skills. For example, students might not have enough background knowledge for reading the text. Hong Kong scholar Hung Chan (2003) state that adequate background knowledge can ease ESL/EFL reading comprehension. The results of her study asserts that background knowledge aids ESL learners to complete cloze tests even if they do not have the required competence to use of the lexical, syntactic, or discourse structures used in the text to entirely understand the text. Yet, readers will fail in comprehension if they do own adequate background knowledge to understand a text, or if they could not have access the adequate prior knowledge (Carrell & Eisterhold, 1988). Another obstacle that shows students' inappropriate reading comprehension skills may be the lack of some reading strategies that are used in normal reading processes, like making predictions about the content of the texts, identifying main ideas, identifying relationships between main ideas, etc. The third obstacle may be the students' failure to use context clues. Numerous scholars (as mentioned in the theory) show that the processes of filling in a cloze test need the use of a broad scope of context clues. Skilled readers use text-level information as a major source of information more usually and use sentence-level and extra-textual information as an extra source to assert their responses. Less skilled readers, however, are less able to use text level information as they put more focus on local grammatical information. In cloze tests, so, less skilled readers usually use clausal or sentential information while they use inter-sentential and textual information less (Lu, 2006).

The cloze test used in the present study is indeed different from a task to guess meaning of unknown words in a text. It requires our subjects to integrate the syntactic, vocabulary as well as semantic knowledge in order to be able to supply the missing items.

The material used in this study includes shortened texts related to topics on Psychology of Education, already taught to the learners. Seven (7) cloze procedure activities which serve as the treatment are simple and not long (no more than 350 words in length). The texts are about *Classical conditioning, the different types of memory, Piaget's stages of cognitive development,* and *Maslow's hierarchy of human needs.* The words deleted are academic terms (technical terms) that have been taught to students during the academic year (2014), in this module. The aim from this research probe is to investigate the students' ability of lexical inference while reading.

4.3.2. The Vocabulary Size Test (VST)

In order to obtain data about vocabulary learning, the *VST (vocabulary Size Test)* is chosen. In the following, a description of the test:

4.3.2.1. Available Versions and Scoring

There are two versions of the vocabulary size test. The 14 000 version, in which every 10 items represent 1000 word family level (hence this version contains 140 items). A learner's overall rating should be multiplied by 100 to obtain his/ her overall receptive vocabulary (Nation, 2012). Beglar (2010) found that the test is adequate for different proficiency levels and is consistent and reliable. Besides that it might be adequate for assessing the vocabulary size of most non-native speakers of English, as Elgort (2013), and Nguyen and Nation (2011) have found. Yet, with native speakers, vocabulary size evaluations being up to 17,000 word families, a larger test was required. The sample on which the novel test is based is a 1 item for every 200 word families, for an overall 20 000 words (Beglar, 2010; Elgort, 2013; Nguyen & Nation 2011; cited in Coxhead, Nation, & sim, 2015).

A learner's overall rating on the 140 item test is required to be multiplied by 100, since every 10 item (taken from the British National Corpus word family lists/ BNC, among the 140 items, represent 1000 word family level (to get the learner's whole vocabulary size. Then, a rating of 35 out of 140 signifies that the learner's vocabulary size is 3500 word families. On the 100 item version assessing up to the 20^{th} 1000 word family level, there are 5 words for every 1000 word family level, then the overall rating is required to be multiplied by 200 (Nation, 2012).

4.3.2.2. Goals and Specifications for Making the Test

The VST uses a four choice multiple choice format added to a stem, and a simple non-defining sentence involving the item "stem". That latter (sentence) restricts the sense of the word, mainly for homographs, and it denotes the item's part of speech (Coxhead et al., 2015).

The test assesses knowledge of the learners written receptive vocabulary size (Nation, 2013), i.e. words required for reading. It mainly assesses context-independent knowledge . The distractors are of the same part of speech as the correct answer. In the following example, the items in square brackets do not appear in the test, but show how the choices were made.

emir: We saw "the emir".

a. bird with two long curved tail feathers [peacock]

b. woman who cares for other people's children in eastern countries [amah]

c. Middle Eastern chief with power in his own land [emir] d. house made from blocks of ice [igloo]

(Coxhead et al., 2015).

The VST is presented in a written form, tests knowledge of a word form and its meaning, and uses a recognition (not recall) format. The first two features are obviously associated with the aim of the test to assess the vocabulary knowledge needed for reading. The use of distractors makes the test easier than a test where the learners would have to remember instead of select the sense, yet this more sensitive assessment of knowledge can be at least slightly compared to the assistance of memory; remembrance of meaning that background knowledge and that linguistic contexts offer when crossing a word while reading a text. The use of distractors boosts the reliability of the scoring. The test items do not need complete knowledge; it permits to use approximate knowledge of words by having distractors that do share main aspects of meaning with the right answer. Hence, the item assessing “azalea” simply needs learners to know that an azalea is a plant. The distractors are written in so easy language comparing to the tested word. For the first and second 1,000 word levels, only words from the first 1,000 were used in the distractors. For words from the 3,000 word level upwards, just the first 2,000 words are used (Coxhead et al., 2015).

4.3.2.3. Interpreting the Scores

To find out what the rating signifies in relation with language use, we are required to consider the lexical threshold, adequate comprehension, vocabulary size required to get text coverage of 98%.

4.3.2.3.1. Reading and listening Comprehension, Lexical Threshold and Vocabulary size

4.3.2.3.1.1. Introduction and Terminology

Laufer and Ravenhorst-Kalovski (2010) define the term Lexical Threshold as *“the minimal vocabulary that is necessary for ‘adequate’ reading comprehension” (2010, p. 15)*. A more simplified definition by Nation (2006) involves *“How much unknown vocabulary can be tolerated in a text before it interferes with comprehension?” (2006, p. 61).* Many Researches have been carried out on the threshold level (for written and spoken text as well). Laufer and Ravenhorst- Kalovski (2010) claim that the majority of contemporary studies are convergent. As for the term Adequate Comprehension, Nation (2006) defines it as “full comprehension” or “unassisted comprehension”, i.e. the understanding of the text is independent of any kind of assistance like access to dictionaries. In order to explain lexical thresholds, researchers usually use *Frequency Levels*, which are based on corpus studies on words frequency of occurrence in the English language. The latter includes 1000 set levels of word families, with the first 1,000 set being the most frequent, and so on. The 1000 words offer via repetition about 90% of unscripted texts (Bogaards & Laufer, 2004). The first two 1000 bands are called high-frequency words which provides a Lexical Coverage of around 80% of written and spoken text, i.e. if the reader is familiar with that amount of vocabulary, then they will cover around 80% of the vocabulary in any given text. This is agreed upon by Francis and Kucera (1982; as cited in Mokhtar et al., 2010) through their scrutiny; also by bogaards and laufer (2004). However, this coverage does not mean that coverage adds 5% with every 1000 Words learned (Bogaards & Laufer, 2004). Moreover, Liu and Nation (1985) state that such percentage is not enough to correctly infer the meanings of unfamiliar words in a text and they are supported by Laufer (1988); 95% coverage or higher is suggested (Liu & Nation, 1985; Laufer, 1988; cited in Mokhtar et al., 2010).

The AWL (academic word list) besides the 2000 frequency lists form a list of 2570 words that provides about 90% text coverage of academic or newspaper texts. Yet adequate/ independent reading comprehension requires, according to Bogaards and Laufer, 95% text coverage (Bogaards & Laufer, 2004). Moreover, Hirsh and Nation (1992) claim that it is possible that *"learners need 95% lexical coverage"* for reading comprehension. Again, Word Engine, an online learning appliance on measuring learners' vocabulary size to estimate their text coverage claims that less than 95% coverage would not permit to understand unassisted written texts (Word Engine, 2017).

In the next sections, appear some of the most recent researches in these areas.

4.3.2.3.1.2. Adolphs & Schmitt 2003: Lexical coverage of spoken discourse

In a research by Schonell et. al. from 1956, according to Adolphs and Schmitt

(2003), it was generally presumed that the high-frequency 2000 word families covered 99% of the general spoken English discourse. This made high-frequency words an adequate vocabulary goal for ESL users. Yet, the research is considered old and relied on a highly restricted corpus. In 2003, Adolphs and Schmitt (2003) carried a more recent corpus study of the lexical coverage of spoken discourse using the CANCODE and the British National Corpus (BNC) conversational corpora. Both these corpora are, to a certain extent recent, and cover a large set of conversations, between people that differ in age, sex, geographical location and social class. They cover a various discourse content and speech genres. Yet, they both rely on English used particularly in the UK and Ireland, which restricts how relevant they are. In the research, the scholars worked with big word families. This may produce straightforward conclusions about the vocabulary size required for the meant coverage, which requires to be taken into account when relating their findings. The outcomes from the research are presented in the table below.

Table 4: Vocabulary size and lexical coverage of spoken discourse

Vocabulary size (word families)	BNC conversational coverage	CANCODE coverage
2000	93.3%	92.26%
3000	95.13%	94.16%
5000	96.93%	96.11%

(Table adapted from Adolphs and Schmitt 2003)

Adolphs and Schmitt (2003) discuss whether 92%-93% coverage is sufficient to take part in everyday discourse, and ended up that more research on the relationship between lexical coverage of spoken discourse and listening comprehension is required to reach a pleasing answer. They do, yet, mentioned that the former assessment of 99% coverage was acceptable, as it signifies that 1 word in every 100 is unfamiliar. yet, according to their research, a 2000 word families will give a lexical coverage lower than 95%, which signifies that one word in every 20 words will be unfamiliar.

4.3.2.3.1.3. Nation 2006: How large a vocabulary is needed for reading and listening?

The majority of research on lexical threshold has been carried out in relation to reading comprehension, and it is agreed that they strongly correlate. In this research, Nation (2006) scrutinises the amount of vocabulary an L2 learner requires to know for the purpose of language comprehension like when reading a newspaper, reading a novel, watching a movie. He uses frequency based lemma lists from the BNC to estimate the *"number of word families needed to read and listen to English intended for native speakers" (Nation 2006, p.60).* The text coverage needed according to Nation's research in 2006 is based on a previous research by Hu and Nation (2000; as cited in Nation, 2000) who assess the relation between lexical coverage and reading comprehension. They conclude that few people reach adequate comprehension with 95 % coverage. At 100% lexical coverage of a text, the majority of the participants reached adequate comprehension, which is uncommon for L2 users to reach, therefore; Hu and Nation (2000) state that at 98% coverage, adequate comprehension could still be reached. In his research, Nation (2006), like Adolphs & Schmitt (2003), chooses to use wide word families in his frequency lists, which will conduct to the actual vocabulary required for adequate comprehension may be larger than the size of the 2006 research will reveal. Nation (2006) explains that for the purpose to read a novel or a newspaper, the reader requires a receptive vocabulary of around 8000-9000 word families. However, 4000 words and proper nouns will provide the reader with almost 95% coverage. Moreover, Nation (2006) ends up that, for the purpose of watch children's movies, a vocabulary of 7000 word families is needed to gain 98% coverage, and around 4000 word families and knowledge of proper nouns till conduct to a lexical coverage of almost 95 %. Nation (2006) pointed out that a vocabulary size of 7000 word families is not required for the purpose of watching and enjoying these movies, but it is required to watch and completely understand what is said. For the purpose to “cope with unscripted spoken English” and reach 95 % coverage, learners require 3000 word families besides proper nouns, while 6000-7000 word families are required to attain 98% coverage.

Moreover, Laufer (1989), in her research, concentrates on the vocabulary size required to guarantee ‘reasonable’ reading comprehension of a text. She finds that those who score 95% and higher on the vocabulary measure are more successful readers than those scoring below 95%. Laufer (1992) conducts more research by testing the link between reading and vocabulary size. Results reveal that the 3000 word families are a minimal vocabulary level to read successfully. In addition, Hirsh and Nation (1992) scrutinize novels written for teenage readers. The results show that a vocabulary size of 2000 to 3000 words offers coverage up to 97% of the words in those novels. Thus, a vocabulary size of 2000 to 3000 words is required to understand those novels. Furthermore, Hu and Nation (1995) compare the influence of text coverage on a reading comprehension of a fiction text. At the 95% coverage level, certain readers attain adequate comprehension but the majority does not. At the 90% coverage level, few attain adequate comprehension, and at the 80% level, none does. Hu and Nation, hence, concluded that teenage readers mainly to know around 98% of the running words in the text to enjoy reading (Laufer, 1992; Hirsh & Nation, 1992; Hu & Nation, 1995; cited in Mokhtar et al., 2010).

4.3.2.3.1.4. Staehr 2008: Vocabulary size and the skills of listening, reading and writing

Staehr (2008) scrutinizes how reading comprehension, listening comprehension and writing skills correlated to vocabulary size. His participants are 88 students in the ninth grade in Denmark, tested on national exams as they are graduating from lower secondary school. They come from six different schools and all have minimally 570 hours of instructed English. The reading and listening comprehension tests are set as multiple choice-tests. Staehr (2008) tests his students' vocabulary size, in advance, using the revised version of the Vocabulary Levels Test. He finds that there is a strong correlation between vocabulary size and reading comprehension, which goes well with earlier research, and a somewhat high correlation between listening comprehension and vocabulary size. This shows that:

> *learners' vocabulary size is more closely associated with their reading comprehension than with their listening comprehension*, according to Stæhr (2008, p.144).

Staehr (2008) also looks to set a vocabulary threshold based on whether students perform below or above average on the tests he made. According to him, the least objective put for Danish students is to know the classic high-frequency vocabulary, i.e. the 2000 most frequent word families of English. He finds that, according to the VLT, 68 out of his 88 participants, i.e. 77%, do not acquire sufficient knowledge of these words. Again, apart from those who do not know this basic vocabulary, 38% score above average on the reading test and 65% of them rate above average on the listening test. However, the mean scores of those who do know the high-frequency vocabulary are regularly higher than that of those who are unfamiliar with this amount of vocabulary (Stæhr, 2008). Moreover, the students who do not master the 2000 level score below average on the reading and writing tests. Stæhr (2008) explains his research and asserts that the threshold of 2000 word families still is a "*crucial learning goal for low-level EFL learners" (p.149).*

4.3.2.3.1.5. Laufer & Ravenhorst-Kalovski 2010: Lexical text coverage, learners' vocabulary size and reading comprehension

The participants in the research are 745 university and college students in Israel. The majority of them was taking English for Academic Purposes course (EAP), and had studied English for at minimum eight years. The researchers investigated the relationship between three variables: reading comprehension, lexical coverage and vocabulary size. Reading comprehension was assessed by the Psychometric University Entrance Test, which is used nationwide in Israel to define whether college students are skilled enough to take university courses in English. Vocabulary size was assessed by a revised version of Nations Vocabulary Levels Test (VLT). The authors mention that this is not a perfect test, which makes their calculations of vocabulary size inexact. The outcomes of the 2010 scrutiny are based on the scores of the 2000, 3000 and 5000 level parts of the test. Tests based on the BNC, made available by Tom Cobb and Paul Nation are used to examine the lexical coverage. Laufer and Ravenhorst-Kalovski's study (2010) shows a strong correlation between the three tested elements: reading comprehension, vocabulary size and lexical coverage. This is the anticipated outcome, yet their study also shows that even so little progress in lexical coverage produces enhancement on the reading test score.The authors talk about two possible causes for this. Either, the enhancement on the reading comprehension score is because of these small amounts of low-frequency words being essential for understanding a text, or it is achieved because of the greater automaticity that follows a larger vocabulary size. Either way, it endorses the importance of learning low-frequency words. Consequently, Laufer and Ravenhorst-Kalovski (2010) suggest that both high- and low-frequency words ought to be taught in English programs at the level they were testing. At the end of the study, the authors propose two different lexical thresholds, highest and lowest. The highest standard is put at 8000 word families, with coverage of 98% and the lowest standard is put at 4000- 5000 word families with coverage of 95 %.

The highest standard is made by defining the term adequate comprehension as *"can read academic material independently" (Laufer & Ravenhorst-Kalovski, 2010, p. 25)* which is very similar to Nations description "unassisted reading". If adequate comprehension is alternatively defined as "reading with some guidance and help", hence the lowest standard is enough (Laufer & RavenhorstKalovski, 2010).

4.3.2.3.1.6. summary

The researches above seem to agree on certain points, but not on others. What Nation (2006) consideres adequate reading comprehension seems to correlate with Laufer and Ravenhorst-Kalovski (2010) optimal threshold. The latter is estimated to be around 8000 word families, with lexical coverage of 98%; yet, 4000-5000 word families are acceptable/ required to attain 95% coverage of both written and spoken English discourse. This is agreed by Nation, Laufer and Ravenhorst-Kalovski. 95% text coverage is the point at which learners can read without the assistance of dictionaries (Bogaards & Laufer, 2004, Word engine, 2017). Moreover, Laufer (1992) reveals that the 3000 word families are a minimal vocabulary level to read successfully.

Concerning the 1000 word families, Laufer & Nation (1995) state that they offer, via repetition, about 90% of unscripted texts. Schonell earlier research (1956) claims a vocabulary size of 2000 word families is necessary to attain 99% coverage of spoken discourse, while Adolph and Schmitt (2003) claim the same size (2000 words) is required to cover 92.26% or 93.3% of unscripted texts/ spoken discourse. Yet, Adolph and Schmitt ended up that more confirming studies are required. Nation (2006) points out that in order to understand spoken discourse, 3000 words are required to reach 95% of text coverage which can be compared with Adolph's and Schmitt's calculation of 5000 words providing that coverage percentage. Yet, 6000- 7000 word families permit total understanding. Moreover, Nation research shows that the 2000 most frequent word families' knowledge provide 80% coverage of written (and spoken) discourse. This is agreed upon by bogaards and laufer (2004); also by Francis and Kucera (1982) through their scrutiny.

Both Staehr and Nation make the point that the vocabulary required for written English is larger than that required to understand spoken English. Yet, Staehr's study also shows that learners may attain scores more than average on reading and listening comprehension tests without the estimated vocabulary size; this could imply that less than basic vocabulary size is sufficient. Hence, more precise definition of "adequate comprehension" is needed.

4.3.2.3.2. Types of vocabulary: traditional view and recent critique

Schmitt (2008) claims that *"learners need large vocabularies to successfully use a second language, and so high vocabulary targets need to be set and pursued" (p. 353)*. When considering frequency based vocabulary, it is presumed that both native and non-native language learners acquire vocabulary in the arrangement of its frequency (Nation, 2006).

High-frequency and low-frequency vocabularies are frequency based. The level of high-frequency vocabulary has been fixed at the 2000 most frequent word families; beginning with West's General Service List (GSL) from 1953 and is still very advocated by Nation. The reason for the concentration on high-frequency vocabulary is because it covers around 80% of any given English text (Nation, 2001). The learners hence get a lot of understanding with a somehow small vocabulary, which is wanted for any language learner. Low-frequency vocabulary has been identified in many ways, *"ranging from anything beyond 2,000 word families all the way up to all of the word families beyond the 10 000 frequency level" (Schmitt, 2008, p. 2).* Essentially, they are all the words that do not belong to the high-frequency words list (Nation, 2001). Nation (2011) proposes that learners and teachers do not treat high- and low-frequency words in the same way in the learning process. He agrees on explicit teaching for the high-frequency vocabulary and that learners should be taught vocabulary learning strategies in order to learn the low-frequency vocabulary in a more implicit way. The idea is that learners begin by learning the high-frequency words and then move on to learning the low-frequency words ‘preferably in a rough order of importance for them’.

4.4. Procedures

By the beginning of the academic year, the first week of Decemeber 2014,participants from both groups (the control group and the experimental group) are presented with the pre-test (the 14 000 version of the Vocabulary Size Test) after the tests have been validated. It takes the participants not more than 15 minutes to complete the task (some students needed more few minutes).

Likewise, and by the end of the academic year (last week of May 2014), the post-test is conducted in the same way as the pre-test (for both groups).

The VST by Nation and Beglar (2007) is tested for reliability (stability) using two equivalent groups among university-level Malaysian English language learners. The assessment has taken place in 2015, and the results reveal the test to be reliable. Additionally, it is to be mentioned that the test is practical because of its aplicability in relation with test submission and scoring (Tan Ai Lin, Pandian, & Jaganathan, 2015).

The experimental group is intervened by the cloze procedure activities where every text/ activity is administered right after the corresponding lesson (by the end of the lecture), during the academic year. The students have to infer the missing items from among a list of items (technical terms in the field of Psychology of Education), taught in the same lecture, in thirty minutes (30 minutes) for each.

The tests are assigned on Sundays in the afternoon (the time where all third year students in “Didactique des Langues” sub-branch have their lectures in the module of Psychology of Education), in 2014. Also, the experiment takes the whole academic year.

Chapter V

Analysis of Treatment: CPF Lexical Inference Activities on Psychology of Education

Introduction

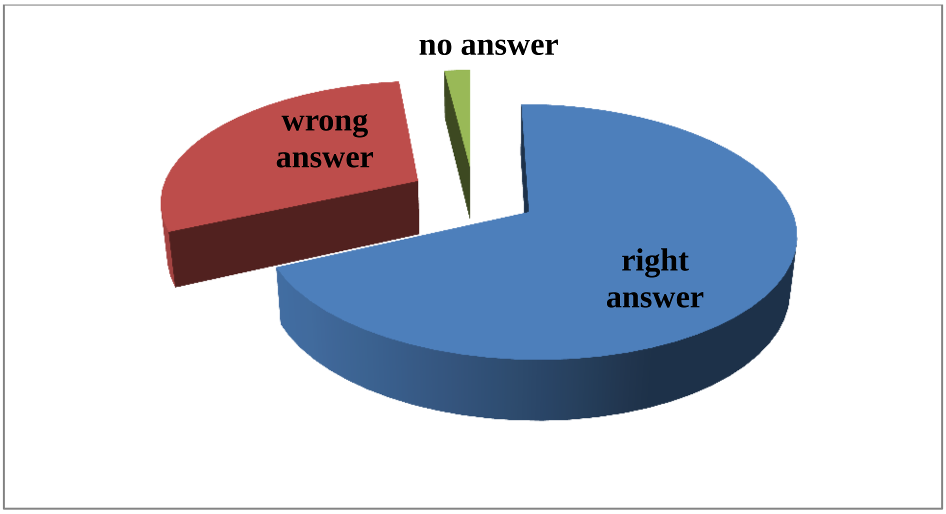
In this part of the study, we examine the students' capacity to infer EFL technical words through cloze procedure format tasks. The participants are administered seven (7) texts and have to complete each one using a given list of the corresponding specialized words. So, are the students able to make such an inference? And what are the linguistic sources they would mainly use for that purpose?

In the following, and to answer these questions, we analyze every text's scores using Quantitative analysis. Frequency tables present the findings where proportions were multiplied by 100 to find percentages. These latter are easier to interpret.

5.1. Analysis of the students' answers/ Memory Types

Item	Right Answer		Wrong Answer		No Answer		Total
	N	%	N	%	N	%	
Sensoryme mory	17	85	03	15	00	00	20
Five senses	17	85	03	15	00	00	20
Stimuli	16	80	04	20	00	00	20
Sensory memory	02	10	18	90	00	00	20
Short-term memory	16	80	04	20	00	00	20
Attention	09	45	11	55	00	00	20
Stimuli	03	15	15	75	02	10	20
Long-term memory	16	80	04	20	00	00	20
Limited capacity	14	70	06	30	00	00	20
Rehearsal	14	70	06	30	00	00	20
Long-term memory	19	95	01	05	00	00	20
Unlimited	18	90	01	05	01	05	20
Short-term memory	17	85	01	05	02	10	20
Total	13,69	***68,45***	06	***30***	*0,38*	***01,92***	

Table 5:Summary Table of the Cloze Procedure Format (Memory)



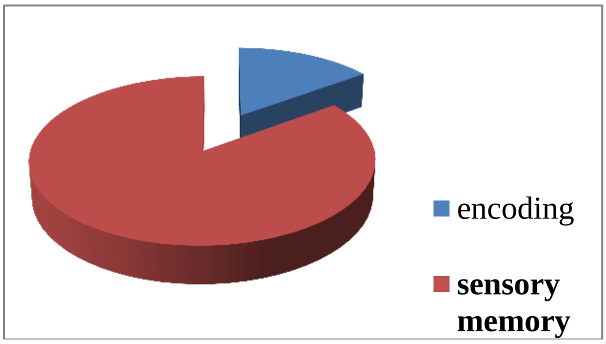
Graph 1: Summary Graph of the Cloze Procedure Format (Memory)

The table indicates that the students' responses vary from one item to another, and even for the same item (the proportions of correct and/ or wrong responses are different for items that appear twice in the passage). The highest proportion of the students' correct answer represents 95%, and the lowest proportion represents 10%, whereas the proportion of incorrect answers vary from 90% to 5%. We should state also that some students (between 10% and 5%) provided no answers for some items.

Totally, about 30% provided wrong answers against 68,45% who gave correct answers. And 1,92% had no answer.

	Wrong answers	N	*%*
Sensory memory	encoding	03	**15**
	Total	03	***15***

Table 6: Item 01: Sensory memory



Graph 2: Item 01: Sensory memory

The table illustrates that few among the students of the sample (15%) gave incorrect answers; they answered by ‘encoding’.

Five senses	**Wrong answers**	N	*%*
	attention	02	**10**
	neurons	01	**05**
	Total	03	***15***

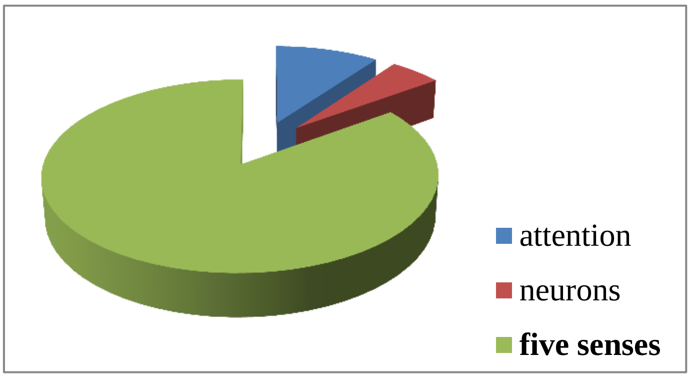


Table 7: Item 02: Five senses

Graph 3: Item 02: Five senses

The information indicates that a number of students (15%) wrongly filled in the second blank. Among the students, 10% answered by ‘attention’. This response might be accepted if the expression, in the text, was for example: “stimuli receive (or attract) *attention* (that is directed by the five senses) not: “…stimuli received through attention”. 5% answered by “neurons” that, again, would be possible if the phrase for example was: “stimuli is received by *neurons*” not: “… stimuli received through *neurons”*. Hence, these mistakes seem to result from difficulties with the language. Moreover, it seems that the learners confuse *attention* and *five senses* (‘attention’ gets the highest percentage as a wrong answer for ‘five senses’ (10%); this might be because they learned that our five senses claim attention.

Stimuli	**Wrong answers**	N	*%*
	five senses	01	**05**
	short-term memory	02	**10**
	attention	01	**05**
	Total	04	***20***

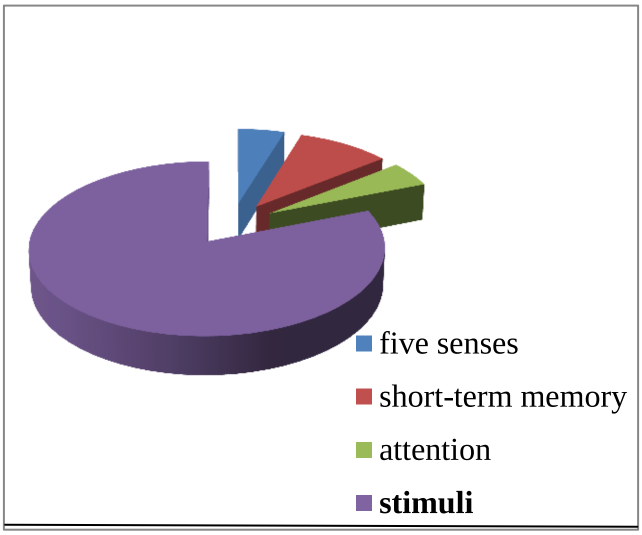


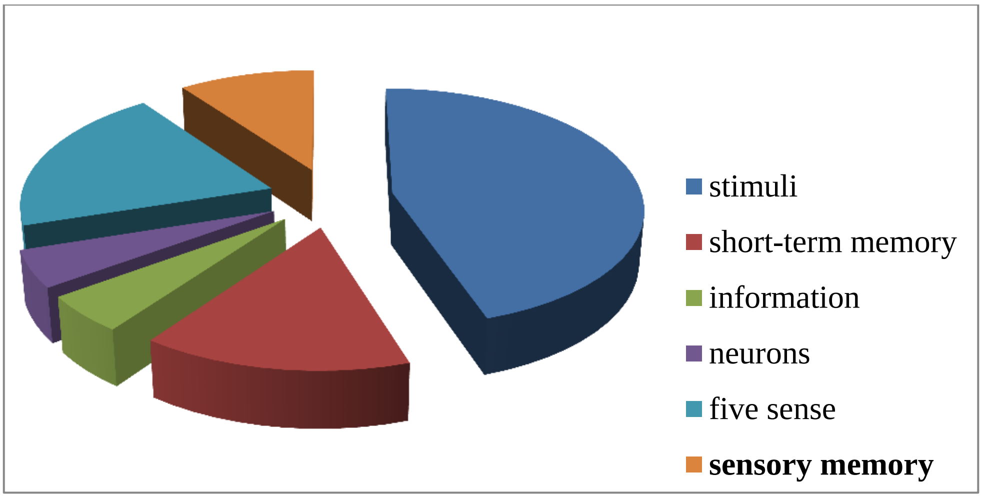
Table 8: Item 03: Stimuli

Graph 4: Item 03: Stimuli

Concerning this item, 20% of the students could not deduce the right answer. 10% answered illogically by ‘short-term memory’, and the same proportion (5%) answered by ‘five senses’, and ‘attention’.

Sensory memory	**Wrong answers**	N	*%*
	Stimuli	09	**45**
	short-term memory	03	**15**
	Information	01	**05**
	Neurons	01	**05**
	five senses	04	**20**
	Total	18	***90***

Table 9: Item 04: Sensory memory

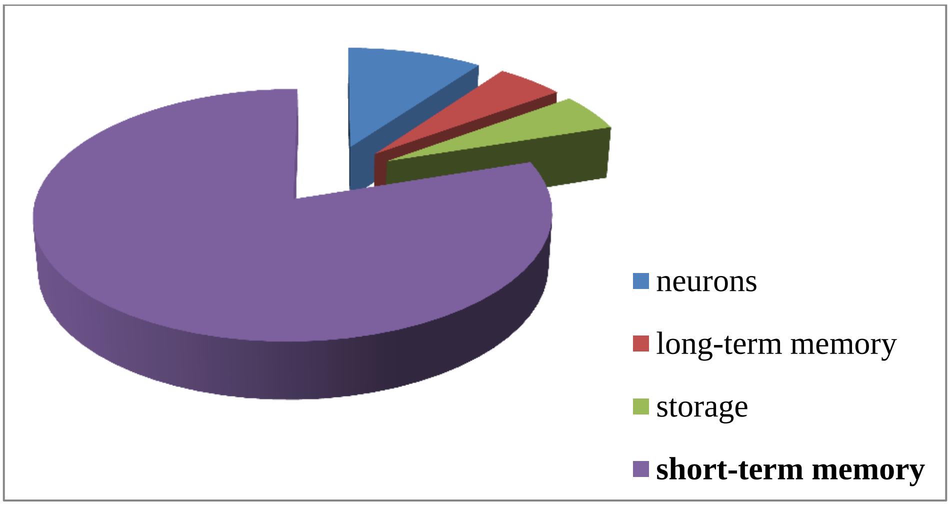


Graph 5: Item 04: Sensory memory

A vast majority of the students (90%) did not find the right answer. They replaced this item by the following items: 'stimuli', 'short term memory', 'information', 'neurons', and 'five senses'. The students seem to confuse *stimuli* and *sensory memory,* as the proportion of 'sensory memory' as a wrong answer for this item is the highest (45%).This is because the two concepts are related, as sensory memory screens incoming stimuli and registers the relevant ones. 20% put the item 'five senses' in the blank. 'short-term memory' had the proportion of 15%. And the rest answered by 'information' and/ or 'neurons', with a percentage of 5% (for both).

	Wrong answer	N	%
Short-term memory	neurons	02	**10**
	long-term memory	01	**05**
	storage	01	**05**
	Total	05	***20***

Table 10: Item 05: Short-term memory

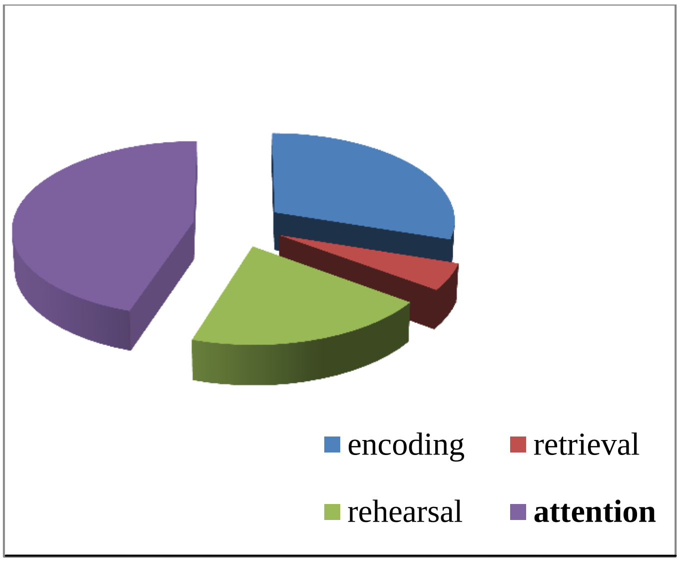


Graph 6: Item 05: Short-term memory

The table illustrates that few among the students of the sample (20%) have been mistaken. 10% chose ‘neurons’ to fill in the blank. And the same proportion (5%) replaced the item by ‘long-term memory’ and ‘storage’.

	Wrong answers	N	%
Attention	encoding	06	**30**
	retrieval	01	**05**
	rehearsal	04	**20**
	Total	11	***55***

Table 11: item 06: Attention

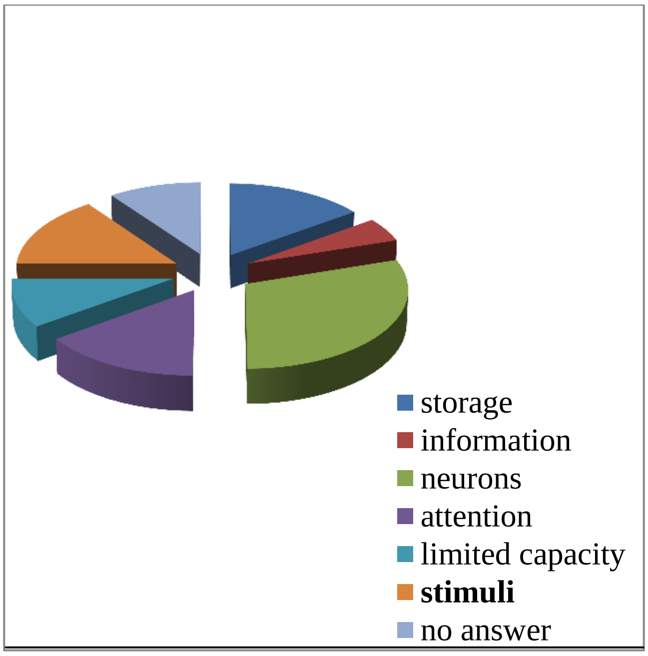


Graph 7: Item 06: Attention

A bit more than half of the students (55%) inserted the wrong item in the blank. Among them, 30% answered by 'encoding' (wrong again),5% provided 'retrieval' as an answer, against 20% who put the item 'rehearsal' in the blank; an answer that does not serve the meaning that the text requires.

	Wrong answers	N	%
Stimuli	storage	03	**15**
	information	01	**05**
	neurons	06	**30**
	attention	03	**15**
	limited capacity	02	**10**
	Total	15	***75***

Table 12: Item 07: Stimuli

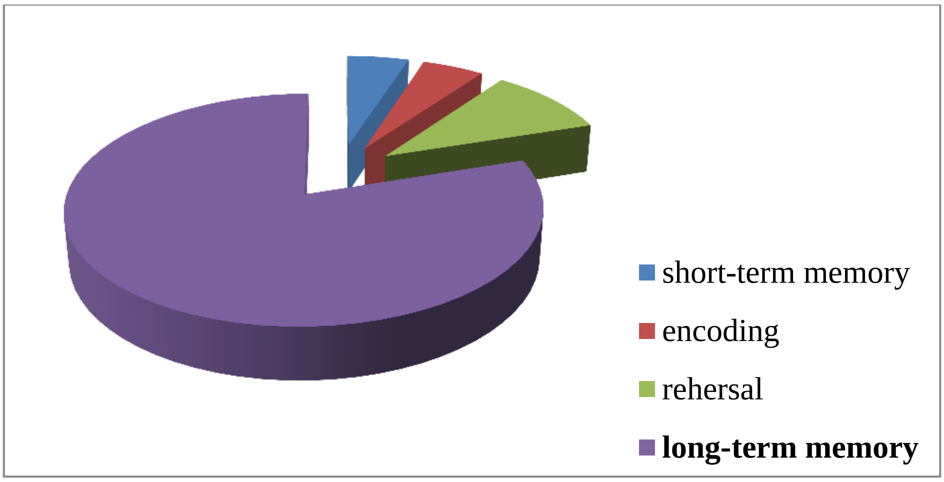


Graph 8: Item 07: Stimuli

A large number of the students (75%) did not find the right answer. 30%, which is the highest proportion, answered by ‘neurons’. The same proportion (15%) answered by ‘storage’ and ‘attention’. 10% filled in the blank with ‘limited capacity’, against a few among them (5%) who chose the word ‘information’ which does not belong to the list of the terminology but part of a phrase that is meant to illustrate the meaning of one of the terms. This might be due to the lack of concentration that might characterize today’s students.

	Wrong answers	N	*%*
long-term memory	short-term memory	01	**05**
	Encoding	01	**05**
	Rehearsal	02	**10**
	Total	04	***20***

Table 13: Item 08: Long-term memory

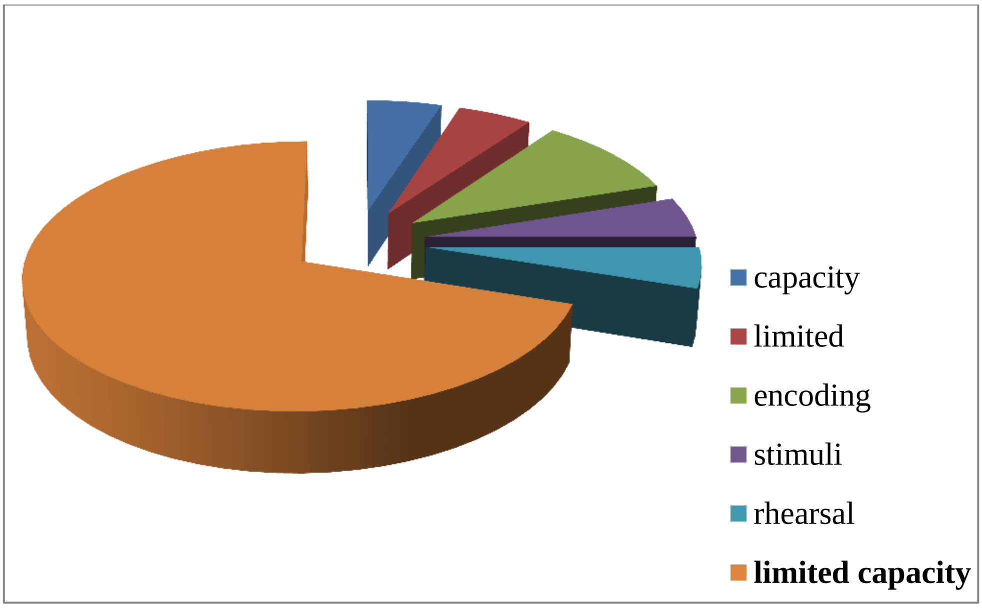


Graph 9: Item 08: Long-term memory

A proportion of 20% of the students’ of the sample finds it difficult to deduce the right answer. The wrong answers which had the same proportion (5%) were: ‘short-term memory' and 'encoding'. And the highest proportion (10%) was that of the term 'rehearsal'.

	Wrong answers	N	%
	capacity	01	**05**
	limited	01	**05**
Limited capacity	encoding	02	**10**
	stimuli	01	**05**
	rehearsal	01	**05**
	Total	06	***30***

Table 14: Item 09: Limited capacity

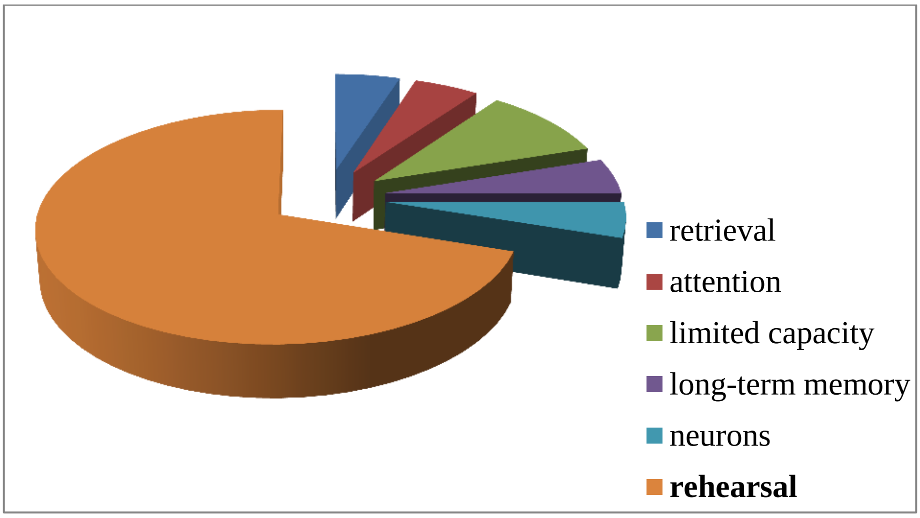


Graph 10: Item 09: Limited capacity

The information indicates that a number of the students (30%) wrongly filled in this blank. A proportion answered by 'encoding' (for the third time). The students are confused about what the term *encoding* stands for, though it means what it sounds like. Encoding involves changing the input (what has been seen, heard, felt, or even thought about) into a memory by associating it with existing knowledge to make it meaningful; like changing the currency of the money when traveling to another country. The same proportion (5%) answered by the items: ‘capacity’, ‘limited’ (the learners might have separated them because of the lack of concentration), and ‘stimuli’ and ‘rehearsal’.

	Wrong answers	N	*%*
Rehearsal	retrieval	01	**05**
	attention	01	**05**
	limited capacity	02	**10**
	long-term memory	01	**05**
	neurons	01	**05**
	Total	06	***30***

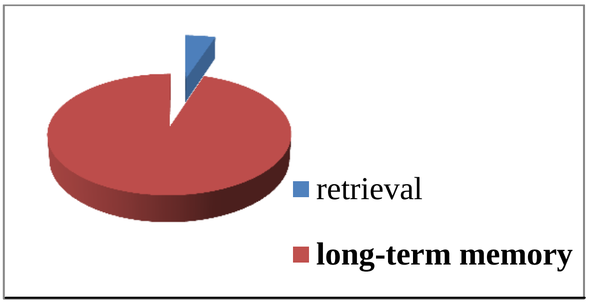
Table 15: Item 10: Rehearsal



Graph 11: Item 10: Rehearsal

This table reports that a relatively large number of the students (30%) inserted the wrong item in the blank. Among them, the same percentage answered by: 'retrieval', attention, 'storage', 'long-term memory', 'neurons'. And 10% filled in the blank with 'limited capacity'. It seems that the students are not clear about what the term *rehearsal* stands for (though it was, and the whole process of memory, well explained and stages were illustrated through examples) in the lectures devoted to that subject.

	Wong answers	N	%
Long-term memory	retrieval	01	**05**
	Total	01	***05***



Tabe 16: Item 11: Long-term memory

Graph 12: Item 11: Long-term memory

Very few among the students' sample (5%) gave wrong answers. They chose 'retrieval' as an answer.

	Wrong answers	N	%
Unlimited	storage	01	**05**
	Total	01	***05***

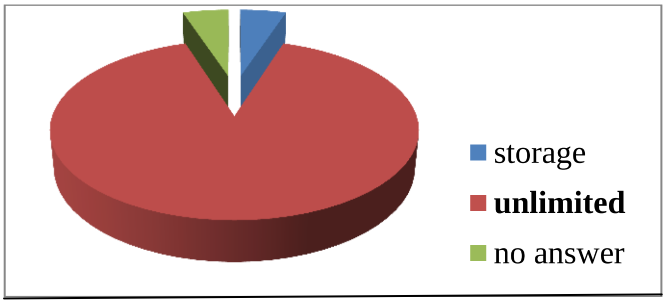


Table 17: Item 12: Unlimited

Graph 13: Item 12: Unlimited

Concerning this item, which is familiar to the students (not part of terminology), the majority of them (90%) could guess the right answer. Only 5% among the total number answered by 'storage'.

Short-term memory	**Wrong Answers**	N	*%*
	sensory memory	01	05
	Total	01	***05***

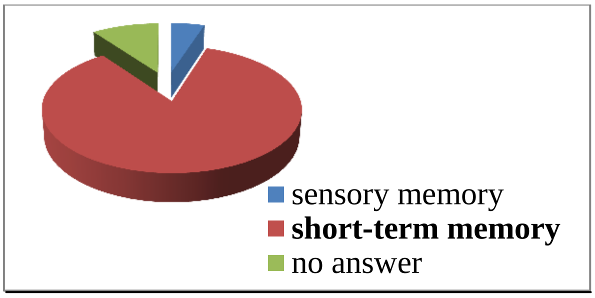


Table 18: Item 13: Short-term memory **Graph 14: Item 13: Short-term memory**

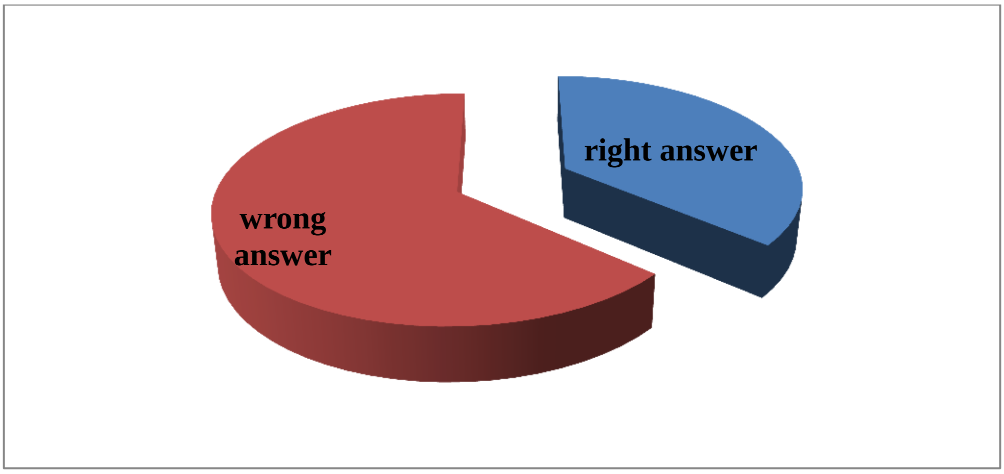
Few among the students (5%) provided wrong answers 'sensory memory' for this item. And a bit higher percentage (10%) provided no answer.

In general, the vast majority of the sample answered right. However, they made many spelling mistakes; like writing *stimuli* with 'y' instead of 'I' in the end, and omit the 'e' before the letter 'v' in 'retrieval'.

5.2. Analysis of the students' answers/ Classical Conditioning

Item	Right Answer		Wrong Answer		No Answer		Total
	N	*%*	N	*%*	N	%	
Neutral stimulus	08	40	12	60	00	00	20
Unconditioned stimulus	04	20	16	80	00	00	20
Unconditioned response	08	40	12	60	00	00	20
Neutral stimulus	08	40	12	60	00	00	20
Unconditioned response	06	30	14	70	00	00	20
Neutral stimulus	07	35	13	65	00	00	20
Conditioned stimulus	10	50	10	50	00	00	20
Conditioned response	07	35	13	65	00	00	20
Total	07,25	***36,25***	12,75	***63,75***	00	***00***	

Table 19: Summary Table of the Cloze Procedure Format (behavioral learning)



Graph 15: Summary Graph of the Cloze Procedure Format (behavioral learning)

The table indicates that the students' responses vary from one item to another, and sometimes somehow for the same item (the proportions of correct and/ or wrong responses are somewhat different for items that appear twice in the passage). The highest proportion of the students' correct answer represents 50%, and the lowest proportion represents 20%, whereas the proportion of incorrect answers vary from 80% to 50%. We should state also that no students provided no answers.

63,75% of participants provided wrong answers against a relatively considerable number (36,25%) who gave correct answers. None had no answer.

	Wrong answers	N	*%*
Neutral stimulus	unconditioned stimulus	02	**10**
	unconditioned response	10	**50**
	Total	12	***60***

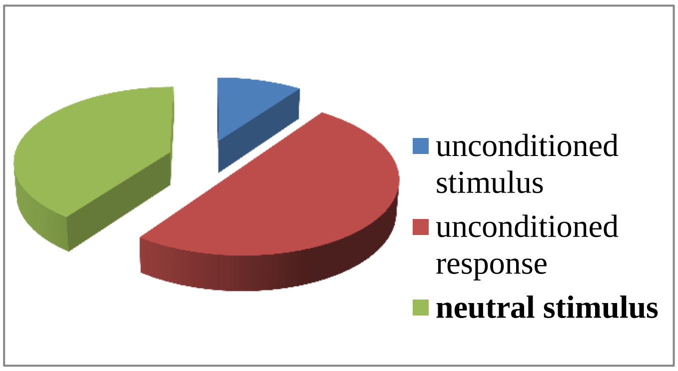
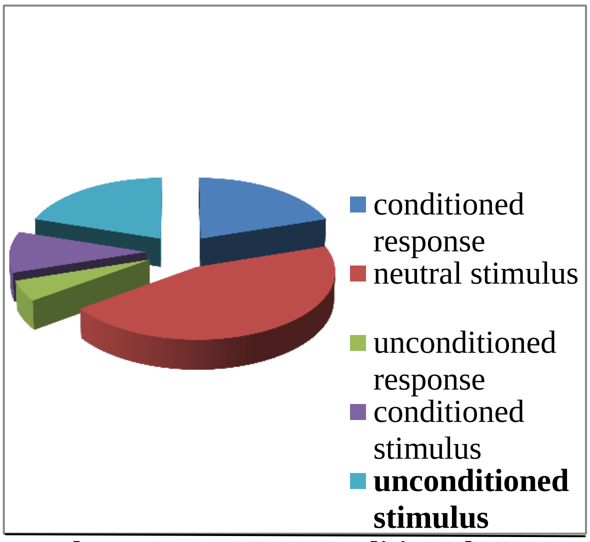


Table 20: Item 01: Neutral stimulus **Graph 16: Item 01: Neutral stimulus**

The table illustrates that a large number of the students of the sample (60%) gave incorrect answers. Among them, 10% gave 'unconditioned stimulus' as an answer, while a proportion of 50% answered by 'unconditioned response'.

Unconditioned stimulus	Wrong answers	N	%
	conditioned response	04	**20**
	neutral stimulus	09	**45**
	unconditioned response	01	**05**
	conditioned stimulus	02	**10**
	Total	16	***80***

Table 21: Item 02: Unconditioned stimulus

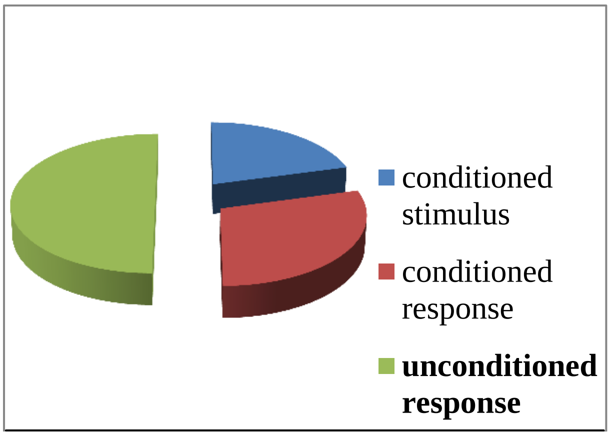


Graph 17: Item 02: Unconditioned stimulus

The information indicates that the vast majority (80%) wrongly filled in the second blank. Among the students, 20% answered by 'conditioned response'. A higher proportion (45%) answered by 'neutral stimulus'. And as for the rest (5%), they gave 'unconditioned response' as an (illogical) answer, and 10% put 'conditioned stimulus' in the blank.

Unconditioned response	Wrong answers	N	%
	conditioned stimulus	05	**25**
	conditioned response	07	**35**
	Total	12	***60***

Table 22: Item 03: Unconditioned response



Graph 18: Item 03: Unconditioned response

Again, concerning this item, 60% of the students could not deduce the right answer. 25% among them answered illogically by "conditioned stimulus", and a proportion of 35% provided "conditioned response" as answer.

	Wrong answers	N	%
Neutral stimulus	unconditioned stimulus	07	**35**
	conditioned response	01	**05**
	conditioned stimulus	03	**15**
	unconditioned response	01	**05**
	Total	12	***60***

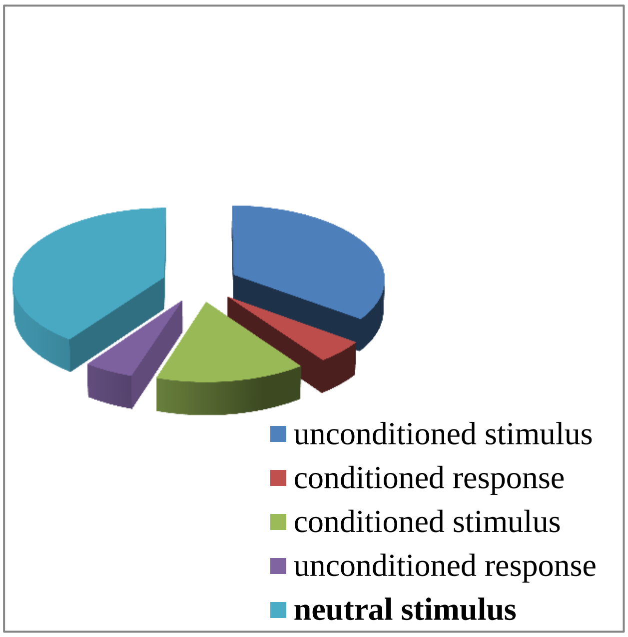


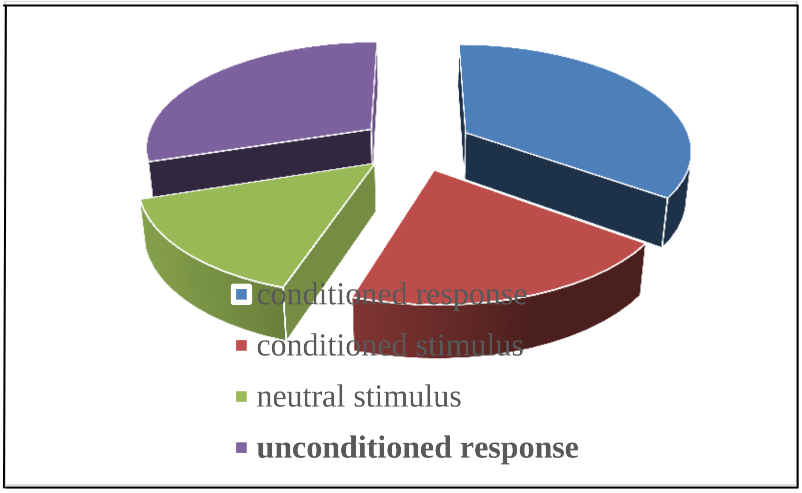
Table 23: Item 04: Neutral stimulus

Graph 19: Item 04: Neutral stimulus

A bit more than half of the students 60% inserted the wrong item in the blank. 35% answered by ‘unconditioned response’ against 15% who answered by ‘unconditioned stimulus’. The same proportion (5%) filled in the blank with ‘conditioned response’ and ‘unconditioned response’.

	Wrong answer	N	%
Unconditioned response	conditioned response	07	**35**
	conditioned stimulus	04	**20**
	neutral stimulus	03	**15**
	Total	14	***70***

Table 24: Item 05: Unconditioned response



Graph 20: Item 05: Unconditioned response

The table illustrates that that 70% of the students of the sample have been mistaken. 35% chose 'conditioned response' to fill in the blank. 20% replaced the item by 'conditioned stimulus ', and the lowest proportion (15%) inserted 'neutral stimulus' in the blank.

	Wrong answers	N	*%*
Neutral stimulus	unconditioned stimulus	10	**50**
	unconditioned response	03	**15**
	Total	13	***65***

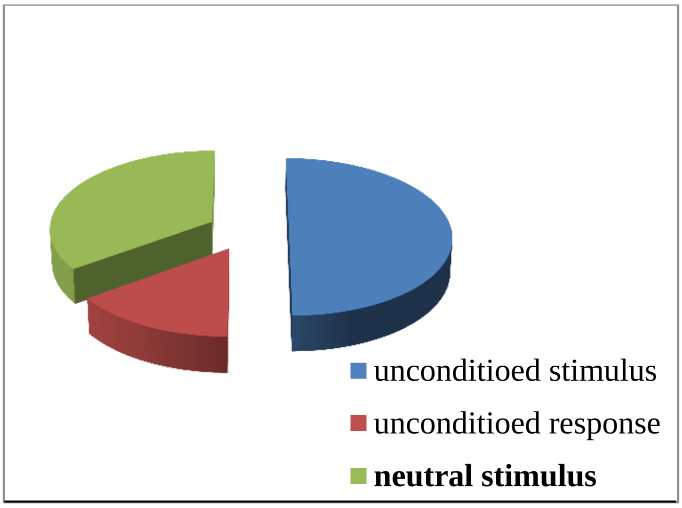


Table 25: Item 06: Neutral stimulus **Graph 21: Item 06: Neutral stimulus**

A large number of the students (65%) did not find the right answer. 50%, which is the highest proportion answered by 'unconditioned stimulus'. And 15% filled in the blank with 'unconditioned response'.

Conditioned stimulus	**Wrong answers**	N	*%*
	conditioned response	05	**25**
	unconditioned stimulus	02	**10**
	unconditioned response	03	**15**
	Total	10	***50***

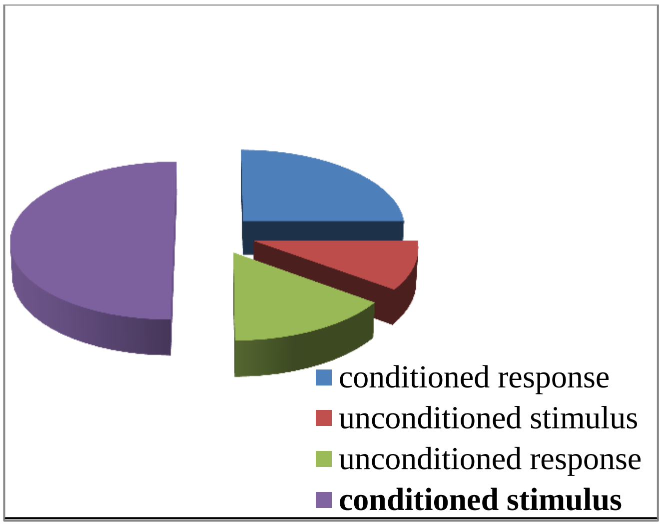


Table 26: Item 07: Conditioned stimulus **Graph 22: Item 07: Conditioned stimulus**

Half of the students' sample (50%) finds it difficult to deduce the right answer. The highest proportion (50%) answered by 'conditioned response'. 20% chose 'unconditioned response'. And few among them (only 10%) decided to answer by 'unconditioned stimulus'.

Conditioned response	**Wrong answers**	N	*%*
	unconditioned response	03	**15**
	unconditioned stimulus	04	**20**
	conditioned stimulus	04	**20**
	neutral stimulus	02	**10**
	Total	08	***65***

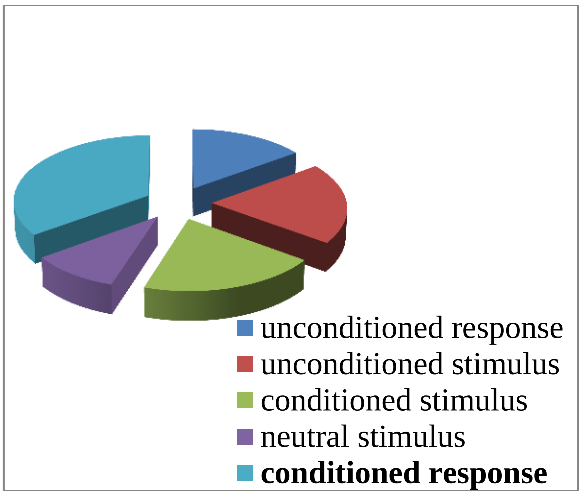


Table 27: Item 08: Conditioned response **Graph 23:Item08: Conditioned response**

This table reports that a large number of the students (65%) inserted the wrong item in the blank. Among them, the same percentage (10%) answered by: 'unconditioned stimulus', 'conditioned stimulus', while 15% filled in the blank with 'unconditioned response', and 10% answered with the item 'neutral stimulus'.

Generally, it seems that the students are confused with the meaning of the given concepts; the lowest proportion of wrong answers is half of the sample (50%), and every item (among the five provided items) registered the highest proportion as a wrong answer for the other items at least once (there are items that represent the highest proportion (as wrong answers) twice and three times).

A proportion that approximates 64% for wrong answers for concepts that have been explained several times (learners' request) through the experiment of Pavlov. The students could not apply what they have learned in the classroom in an equivalent context.

Having different proportions (of right and wrong answers) for the same item reveals that the item *concept* is not clear in the learners' minds. However, this might result from problems with EFL (i.e. the understanding of the passage), the students' lacking of concentration, too.

The aim behind the construction that some concepts shall appear twice in the passage is to assess the students' level of understanding of concepts.

5.3. Analysis of the students' answers/ Piaget's Stages of Cognitive Development: Adaptation

5.3.1.Analysis of the Answers of the Third Text: Adaptation

Item	**Right Answer**		**Wrong Answer**		**No Answer**		**Total**
	N	*%*	N	*%*	N	*%*	
Schemes	11	55	04	20	05	25	20
Adaptation	20	100	00	00	00	00	20
Assimilation	19	95	01	05	00	00	20
Scheme	20	100	00	00	00	00	20
Scheme	20	100	00	00	00	00	20
Accomodation	11	55	03	15	06	30	20
Schemes	21	90	02	10	00	00	20
Total	17,42	***85***	01,42	***07,14***	01,57	***07,85***	

Table 28:Summary Table of the Cloze Procedure Format (how cognitive development occurs)

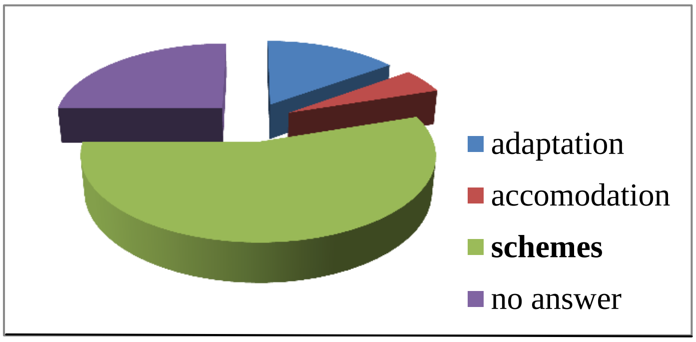
Graph 24: Summary Graph of the Cloze Procedure Format (how cognitive development occurs)

The table indicates that the students' responses vary from one item to another, and even for the same item (the proportions of correct and/ or wrong responses are somewhat different for items that appear several times in the passage). The highest proportion of the students' correct answer represents 100%, and the lowest proportion represents 55%, whereas the proportion of incorrect answers vary from 0% to 20%. We should state also that some students (between 25% and 30%) provided no answers for some items.

In general, about 7,14% provided wrong answers against 85% who gave correct answers. And 7,85% had no answer. And among those who provided 'scheme' as correct answer, many added the's' of the plural when the item takes the singular form and the opposite. This is related to Grammar competence.

Schemes	**Wrong answers**	N	***%***
	adaptation	03	**15**
	accomodation	01	**05**
	Total	04	***20***

Table 29: Item 01: Schemes



Graph 25: Item 01: Schemes

The information indicates that a number of the students (20%) wrongly filled in this blank. 15% answered by 'adaptation', and the others (a percentage of 5%) answered with 'accommodation'.

Adaptation	Wrong answers	N	%
	/	00	**00**
	Total	00	***00***

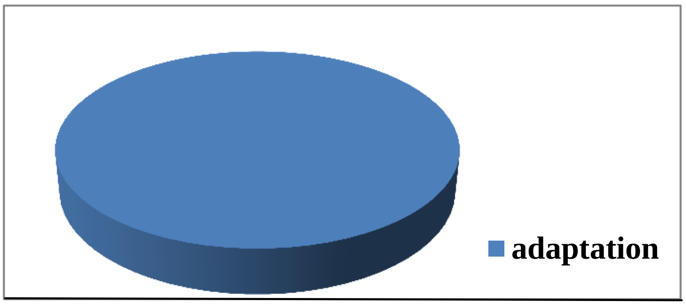


Table 30: Item 02: Adaptation **Graph 26: Item 02: Adaptation**

100% of the sample answered correctly.

Assimilation	Wrong answers	N	%
	adaptation	01	**05**
	Total	01	***05***

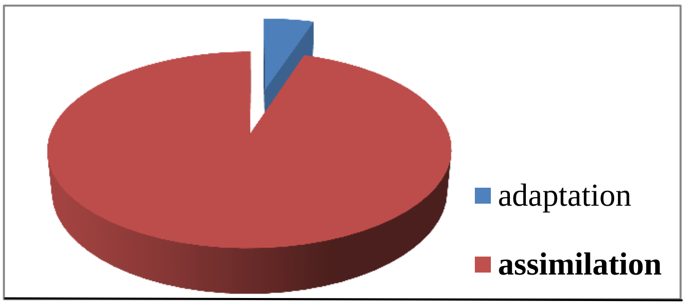


Table 31: Item 03: Assimilation **Graph 27: Item 03: assimilation**

Very few among the students (5%) provided wrong answers for this item. They had ‘adaptation’ as an answer.

Scheme	Wrong answers	N	%
	/	00	**00**
	Total	00	***00***

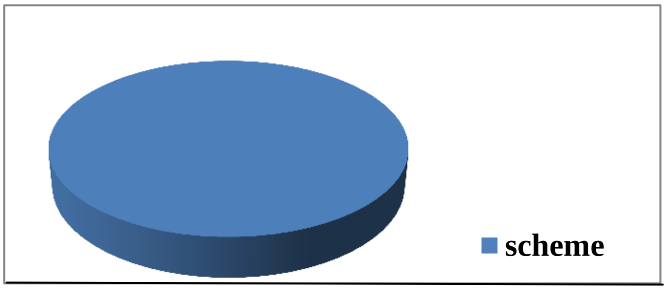


Table 32: Item 04: Accomodation **Graph 28: Item 04: Accomodation**

Scheme	Wrong answers	N	%
	/	00	**00**
	Total	00	***00***

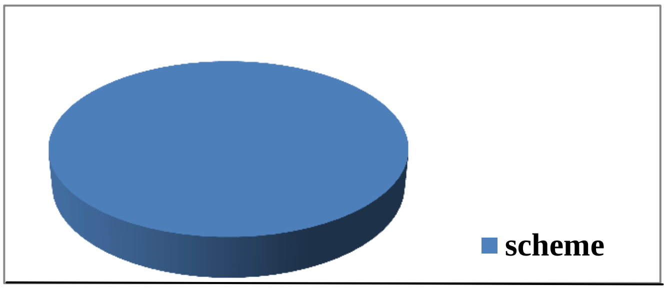


Table 33: Item 05: Scheme

Graph 29: Item 05: Scheme

None provided wrong answers for item number 3 and item number 4 (‘scheme’).

Accomodation	Wrong answers	N	%
	adaptatation	02	**10**
	assimilation	01	**05**
	Total	03	***15***

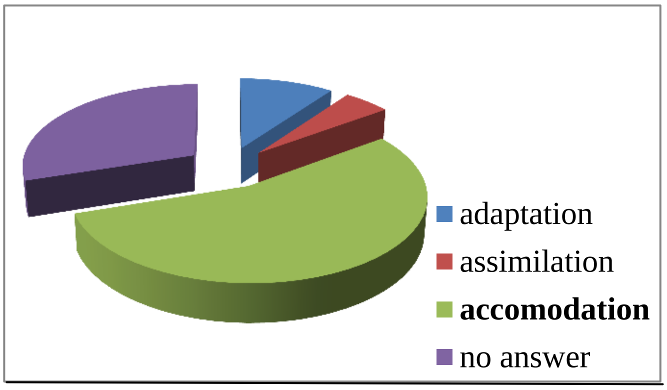


Table 34: Item 06: Accomodation

Graph 30: Item 06: Accomodation

For this item, a percentage of 15% gave wrong answers. Among them, 10% chose ‘adaptation’ as an answer. And 5% filled in the blank with ‘assimilation’.

Schemes	Wrong answers	N	%
	accomodation	02	**10**
	Total	02	***10***

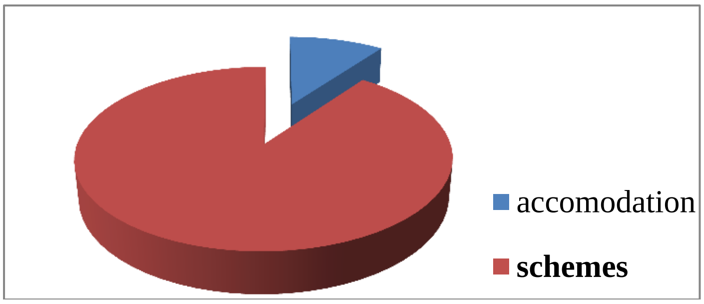


Table 35: Item 07: Schemes

Graph 31: Item 07: Schemes

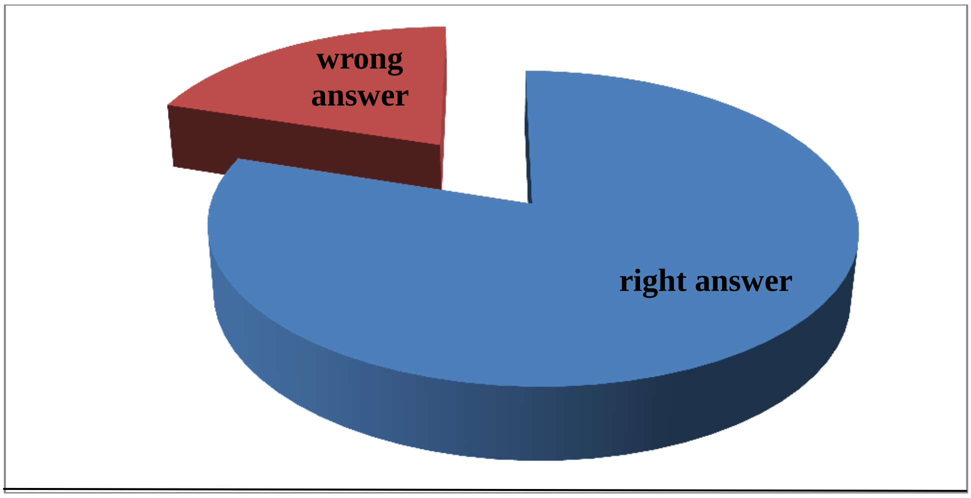
The table in the previous page indicates that a low proportion (10%) gave ‘accommodation’ as a wrong answer.

Generally, it seems that the learners are clear about the concepts included in the way development occurs according to Piaget (especially the number of the items is limited (four items (4); the vast majority of them gave correct answers.

5.3.2. Analysis of the students' answers: The Sensorimotor Stage

Item	Right Answer		Wrong Answer		No Answer		Total
	N	*%*	N	*%*	N	%	
Sensorimotor	20	100	00	00	00	00	20
Reflexes	12	60	08	40	00	00	20
Schemes	11	55	09	45	00	00	20
Sensorimotor	20	100	00	00	00	00	20
Object permanence	17	85	03	15	00	00	20
Total	16	***80***	04	***20***	00	***00***	

Table 36:Summary Table of the Cloze Procedure Format (sensorimotor stage/ Piaget)



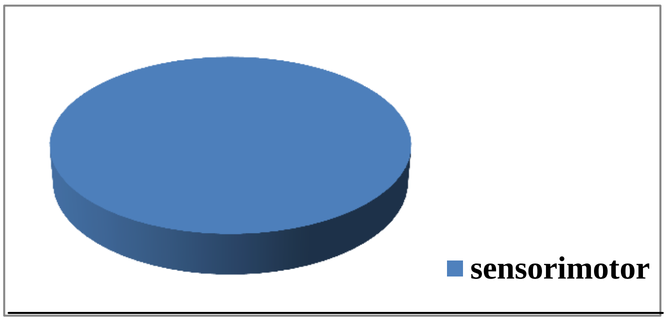
Graph 32: Summary Graph of the Cloze Procedure Format (sensorimotor stage/ Piaget)

The table indicates that the students' responses vary from one item to another; however, all the participants (100%) provided a right answer for the item *sensorimotor*, in the two corresponding blanks. When it comes to different stage, we have this tendency to grasp the first one better than the others, especially, here, I called the learners' attention to the word *sensorimotor* (sensory and motor) where the child relies on his/her senses to learn about himself/ herself and the world. The highest proportion of the learners' correct answer represents 100%, and the lowest proportion represents 55%, whereas the proportion of incorrect answers vary from 45% to 15%.

On the whole, about 20% provided wrong answers against 80% who gave correct answers.

Sensorimotor	**Wrong answers**	N	*%*
	/	00	**00**
	Total	00	***00***

Table 37: Item 01: Sensorimotor

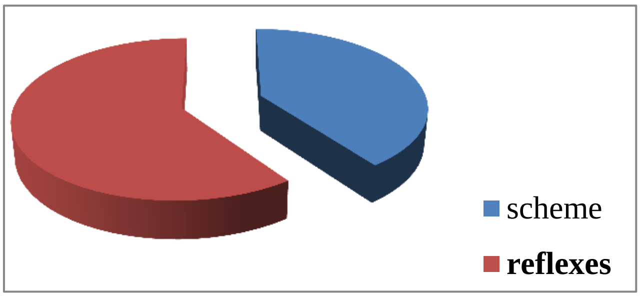


Graph 33: Item 01: Sensorimotor

None gave a wrong answer for this item.

Reflexes	**Wrong answers**	N	*%*
	schemes	08	**40**
	Total	08	***40***

Table 38: Item 02: Reflexes



Graph 34: Item 02: Reflexes

The table illustrates that a considerable number of the students of the sample (40%) gave incorrect answers; they answered by 'schemes'.

Schemes	Wrong answers	N	%
	reflexes	08	**40**
	Object permanence	01	**05**
	Total	09	***45***

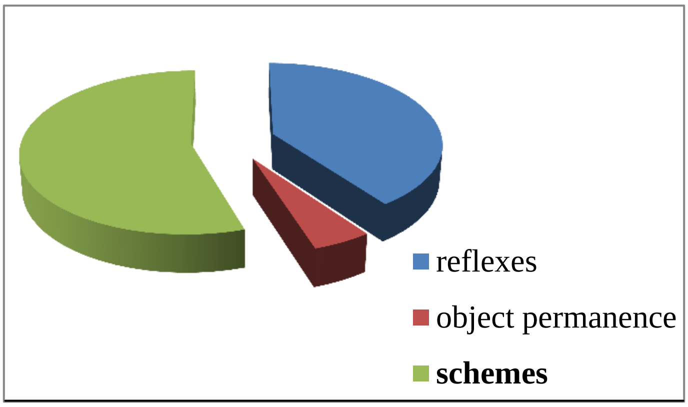


Table 39: Item 03: Schemes

Graph 35: Item 03: Schemes

A bit less than half of the students wrongly filled in the blank. They chose 'schemes' as answer.

Sensorimotor	Wrong answers	N	%
	/	00	**00**
	Total	00	***00***

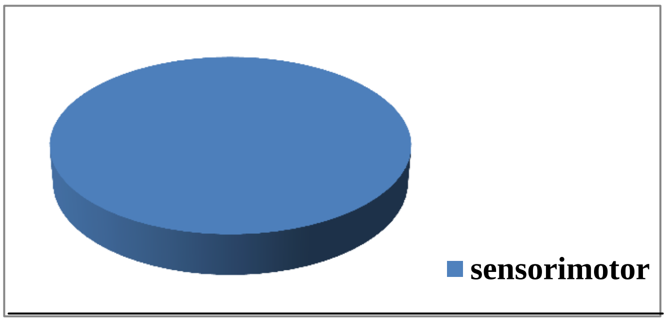


Table 40: Item 04: Sensorimotor

Graph 36: Item 04: Sensorimotor

Again, none gave a wrong answer for this item.

Object permanence	Wrong answers	N	%
	schemes	03	**15**
	Total	03	***15***

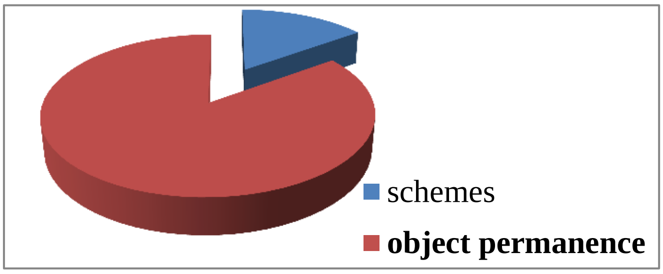


Table 41: Item 05: Object permanence

Graph 37: Item 05: Object permanence

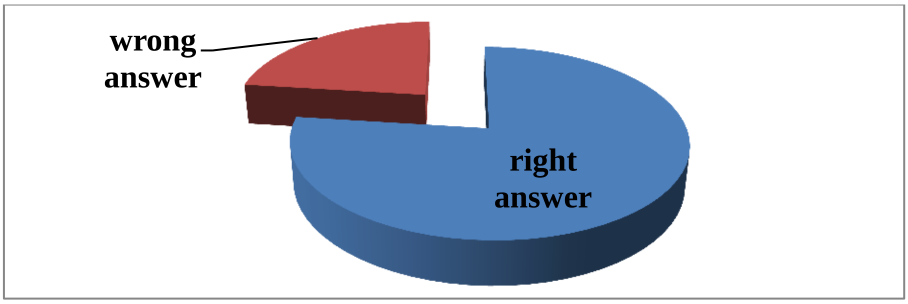
Concerning this item, only 15% of the students could not deduce the right answer; they answered by ‘schemes’. It seems that the students had a have understood what that terminology means.

Well, in general, it is remarkable that the notion of *scheme* was used interchangeably with *reflexes*. The students might be confused because of the interconnection between the two; as reflexes are coordinated actions (like looking and grasping), whereas schemes are innate reactions (to external stimuli) that we are born with (in our genes). In this sense, reflexes are the raw materials to build up sensorimotor schemes.

5.3.3. Analysis of the students' answers: The Preoperational Stage

Item	Right Answer		Wrong Answer		No Answer		Total
	N	%	N	%	N	%	
Preoperational	20	100	00	00	00	00	20
Conservation	18	90	02	10	00	00	20
Preoperational	11	55	09	45	00	00	20
Centration	14	70	06	30	00	00	20
Reversibility	18	90	02	10	00	00	20
Preoperational	18	90	02	10	00	00	20
Egocentric	18	90	02	10	00	00	20
Total	16,71	***83,57***	03,28	***16,42***	00	***00***	

Table 42:Summary Table of the Cloze Procedure Format (preoperational stage/ Piaget)



Graph 38: Summary Graph of the Cloze Procedure Format (preoperational stage/ Piaget)

The table indicates that the students' responses vary from one item to another, and even for the same item (the proportions of correct and/ or wrong responses are different for items that appear twice in the passage). The highest proportion of the learners' correct answer represents 100%, and the lowest proportion represents 55%, whereas the proportion of incorrect answers vary from 45% to 10%.

All in all, about 16,42% provided wrong answers against 83,57% who gave correct answers.

Preoperational	**Wrong answers**	N	*%*
	/	00	**00**
	Total	00	***00***

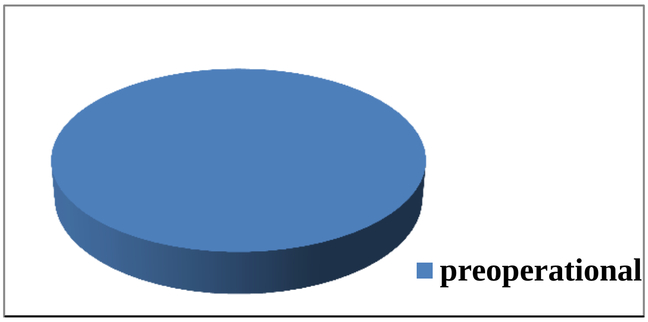


Table 43: Item 01: Preoperational **Graph 39: Item 01: Preoperational**

All the students (100%) gave correct answer.

Conservation	**Wrong answers**	N	*%*
	centration	02	**10**
	Total	02	***10***

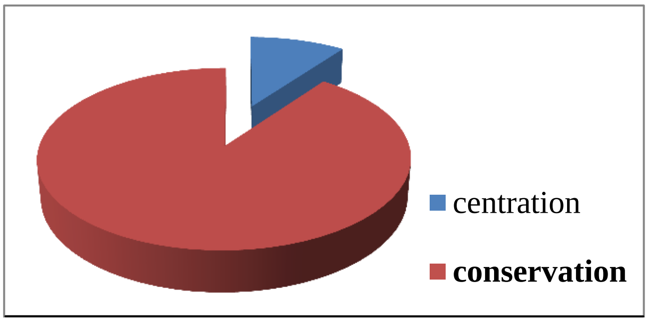
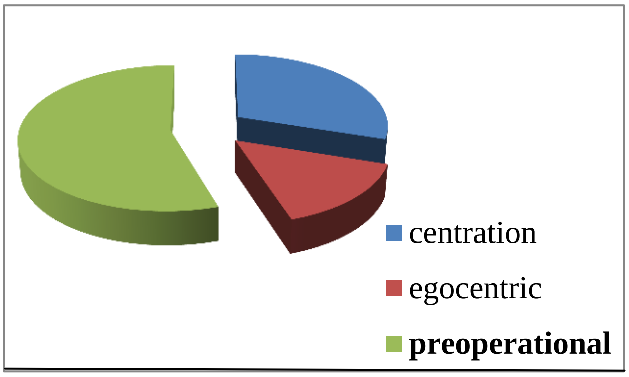


Table 44: Item 02: Conservation **Graph 40: Item 02: Conservation**

The table indicates that few among the students (10%) have been mistaken. They answered by 'centration'.

	Wrong answers	N	%
Preoperational	centration	06	**30**
	egocentric	03	**15**
	Total	09	***45***

Table 45: Item 03: Preoperational

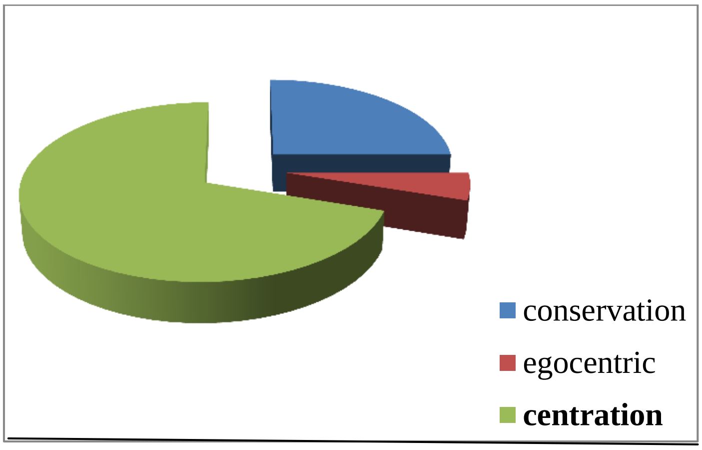


Graph 41: Item 03: Preoperational

A proportion that approximate half of the sample (45%) finds it difficult to deduce the right answer. The wrong answers ‘centration’ and “egocentric” had the percentages of 30% and 15% respectively.

	Wrong answers	N	*%*
Centration	Conservation	05	**25**
	Egocentric	01	**05**
	Total	06	***30***

Table 46: Item 04: Centration



Graph 42: Item 04: Centration

This table reports that a relatively large number of the learners (30%) inserted the wrong item in the blank. 25% answered by “conservation”, and few (10%) filled in the blank with ‘egocentric’.

Reversibility	***Wrong answers***	N	*%*
	egocentric	02	**10**
	Total	02	***10***

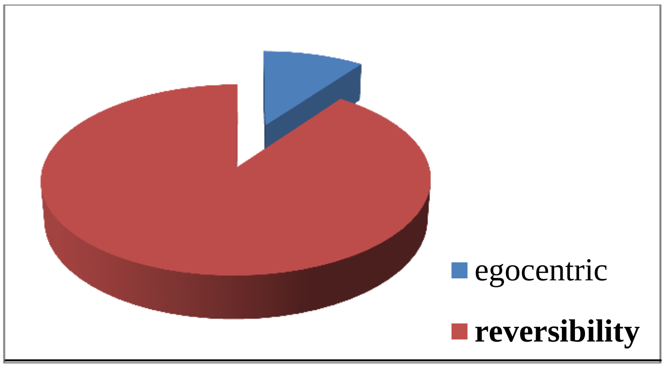


Table 47: Item 05: Reversibility

Graph 43: Item 05: Reversibility

The information indicates that a number of the learners (10%) chose the wrong item 'egocentric'.

Preoperational	***Wrong answers***	N	*%*
	centration	02	**10**
	Total	02	***10***

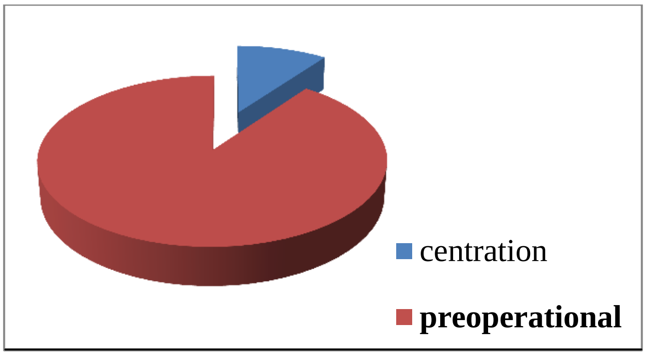


Table 48: Item 06: Preoperational

Graph 44: Item 06: Preoperational

Few among the learners (10%) gave wrong answers. They answered with the item 'centration'.

Egocentric	**Wrong answers**	N	*%*
	conservation	02	**10**
	Total	02	***10***

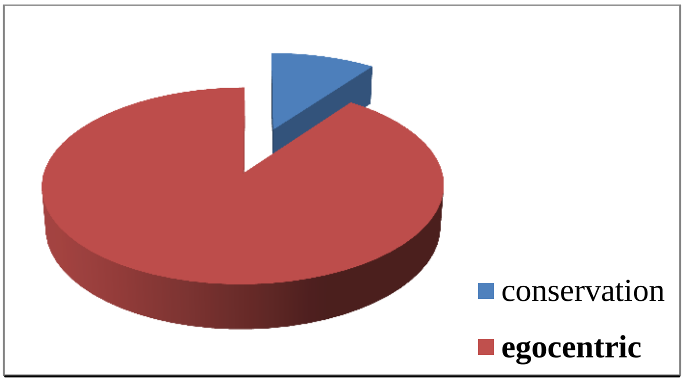


Table 49: Item 07: Egocentric

Graph 45: Item 07: Egocentric

Again, the same proportion (10%) answered, wrongly, with 'conservation'.

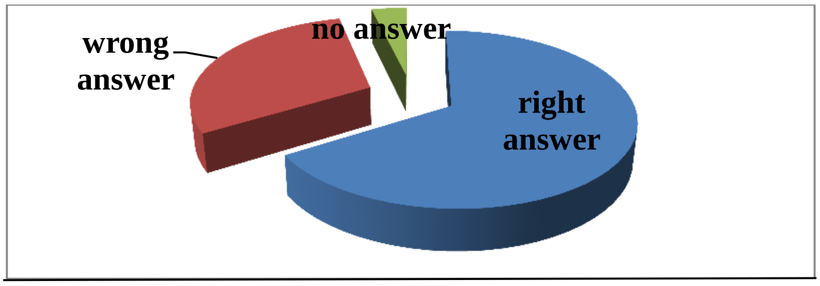
On the whole, and unexpectedly, the vast majority of the learners answered correctly for this passage (almost 84%). It seems that the learners have grasped the meaning of the concepts related to the preoperational stage. It might be that their level of concentration was high especially that the exams were not so far.

We should state, also, that the proportions that represent wrong answers for the first, third and sixth item ‘preoperational’ are totally different (0%, 45%, and 10%). This, again, shows that the learners are not clear about what this concept stands for or they have problems with the language.

5.3.4. Analysis of the students' answers: The Concrete and Formal Operational Stages

Item	Right Answer		Wrong Answer		No Answer		Total
	N	%	N	%	N	%	
Seriation	17	85	03	15	00	00	20
Transitivity	17	85	03	15	00	00	20
Transitivity	03	15	14	70	03	15	20
Concrete	13	65	06	30	01	05	20
Abstract	17	85	03	15	00	00	20
Hypothetical	14	70	04	20	02	10	20
Formal operations	10	50	10	50	00	00	20
Abstract	15	75	05	25	00	00	20
Total	13,25	***66,25***	06	***30***	*0,75*	***03,75***	

Table 50:Summary Table of the Cloze Procedure Format (concrete and formal operational stage/ Piaget)



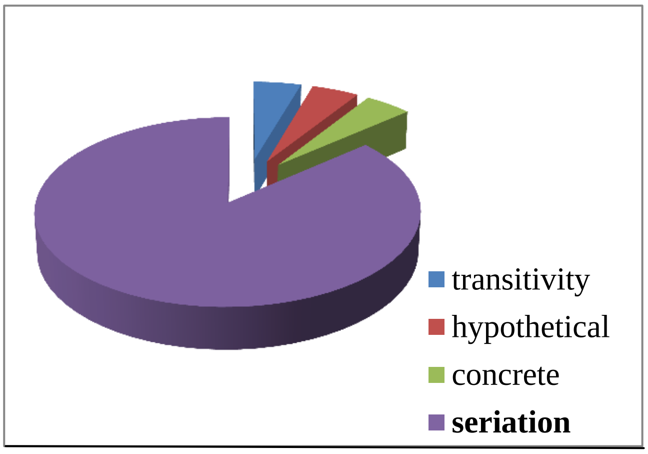
Graph 46: Summary Graph of the Cloze Procedure Format (concrete and formal operational stage/ Piaget

The table indicates that the students' responses vary from one item to another, and even for the same item (the proportions of correct and/ or wrong responses are different for items that appear twice in the passage). The highest proportion of the students' correct answer represents 85%, and the lowest proportion represents 15%. The proportion of incorrect answers lies in the same scope (vary from 70% to 15%). We should state also that some students (between 15% and 5%) provided no answers for some items.

Overall, about 66,25% provided wrong answers against 30% who gave correct answers. And 3,75% had no answer.

	Wrong answers	N	*%*
Seriation	transitivity	01	**05**
	hypothetical	01	**05**
	concrete	01	**05**
	Total	03	***15***

Table 51: Item 01: Seriation



Graph 47: Item 01: Seriation

The table illustrates that few among the learners of the sample (15%) gave incorrect answers. The same proportion (5%) answered by 'transitivity' and 'seriation', and 'concrete'.

	Wrong answers	N	%
Transitivity	seriation	03	**15**
	Total	03	***15***

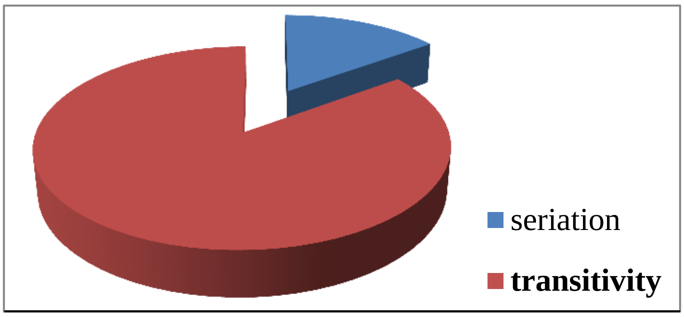


Table 52: Item 02: Transitivity

Graph 48: Item 02: Transitivity

For this item, a percentage of 15% gave wrong answers. They chose ‘seriation’.

	Wrong answers	N	%
Transitivity	concrete	06	**30**
	abstract	06	**30**
	hypothetical	02	**10**
	Total	14	***70***

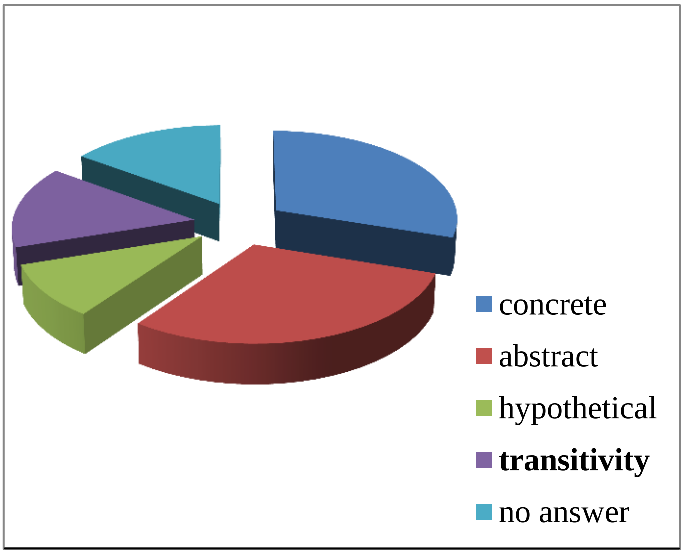


Table 53: Item 03: transitivity

Graph 49: Item 03: Transitivity

A very large number of the students (70%) did not find the right answer. The highest proportion (30%) replaced the item with ‘concrete’ and ‘abstract’, and the lowest proportion (10%) answered by ‘hypothetical’. Whereas 15% gave no answer.

Concrete	***Wrong answers***	N	***%***
	Abstract	03	**15**
	hypothetical	01	**05**
	transitivity	01	**05**
	Seriation	01	**05**
	Total	06	***30***

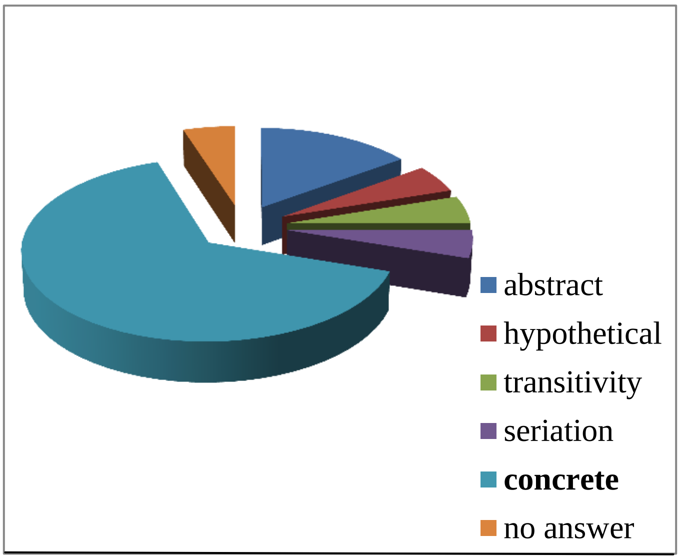


Table 54: Item 04: Concrete

Graph 50: Item 04: Concrete

A relatively large number of the students (30%) inserted the wrong item in the blank. Among them, the same percentage answered by: ‘hypothetical’, ‘transitivity’, and/ or ‘seriation’. 15% filled in the blank with ‘abstract’. While 5% gave no answer.

Abstract	**Wrong answers**	N	***%***
	Concrete	03	**15**
	Total	03	***15***

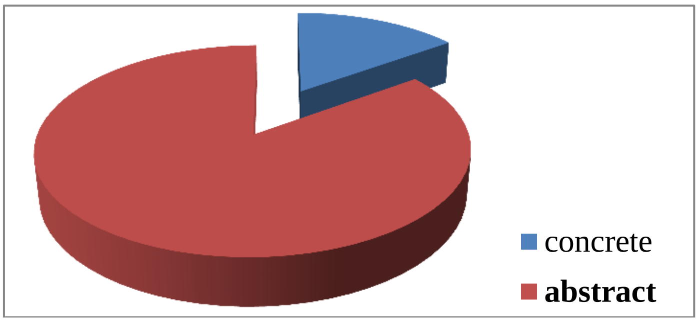


Table 55: Item 05: Abstract

Graph 51: Item 05: Abstract

A small proportion of the sample (15%) gave incorrect answers for this item. They inserted ‘concrete’.

	Wrong answers	N	*%*
Hypothetical	concrete	03	**15**
	seriation	01	**05**
	Total	04	***20***

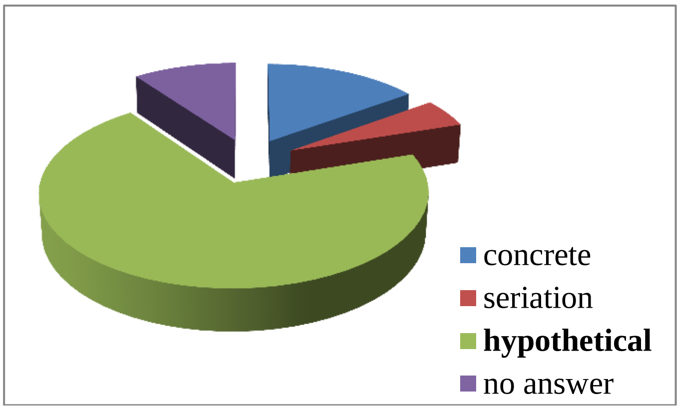


Table 56: Item 06: Hypothetical **Graph 52: Item 06: Hypothetical**

Among the students of the sample, 20% gave incorrect answers; they answered by ‘concrete’ (for 15%) and ‘seriation’ (for just 5%). And 10% provided no answer.

	Wrong answers	N	*%*
Formal operations	concrete	08	**40**
	transitivity	01	**05**
	seriation	01	**05**
	Total	10	***50***

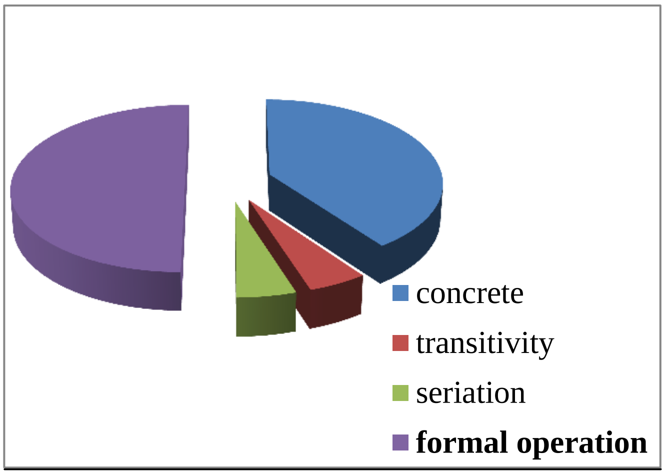
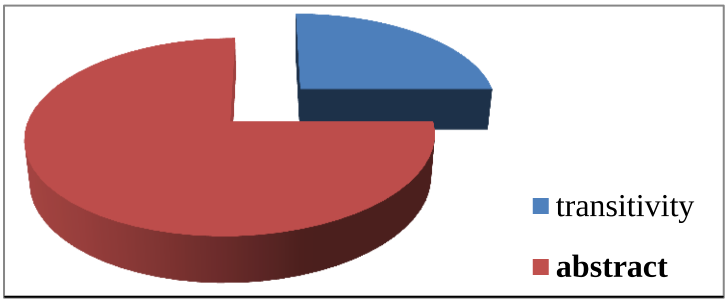


Table 57: Item 07: Formal operations **Graph 53: Item 07: Formal operations**

Half of the sample (50%) provided wrong answers. Among which 40% answered by ‘concrete’, and the same proportion (5%) inserted ‘transitivity’ and/ or ‘seriation’.

	Wrong answers	N	*%*
Abstract	Transitivity	05	**25**
	Total	05	***25***

Table 58: Item 08: Abstract



Graph 54: Item 08: Abstract

Concerning this item, 25% of the students of the sample could not guess the right answer. This proportion answered by ‘transitivity’.

Generally, it seems that the students have difficulties with the concept of *transitivity* as they differently and wrongly answered for it in the second and third item (‘transitivity’) for 15% and 70% respectively. Or the students might have problems with understanding.

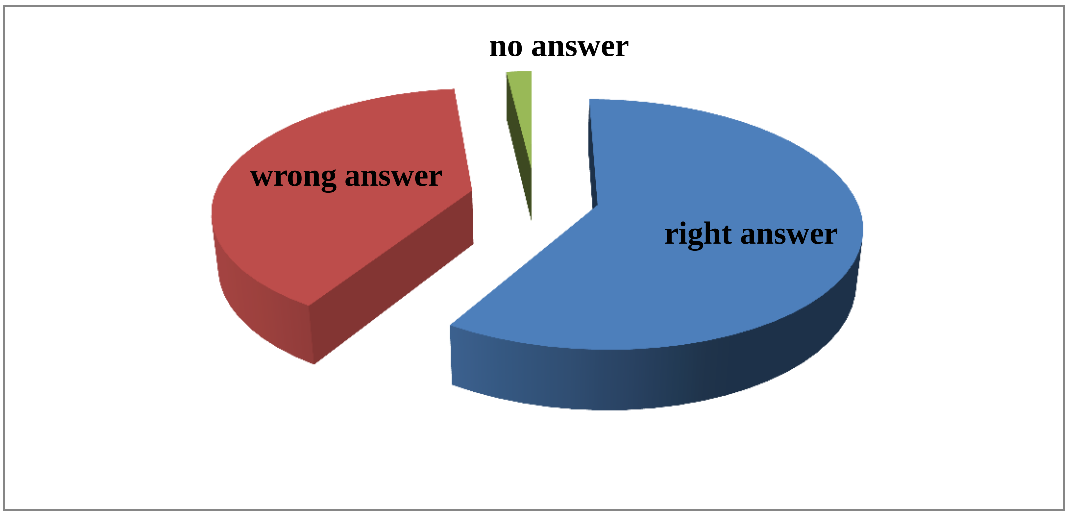
In addition, the students of the sample seem to mix the third stage of cognitive development suggested by Piaget with the last (fourth) stage. For example, they illogically inserted ‘concrete’ in the blank instead of ‘formal operations’ for 40% (the highest proportion), and/ or ‘concrete’ instead of ‘abstract’ for 30% which is the highest proportion too (among the wrong answers given for *abstract*). And surprisingly, 50% among them have been mistaken when it comes to ‘the formal operational stage’ that has mainly to do with abstract thinking.

The concept *abstract* and *hypothetical* could be used interchangeably (items number five, six, and eight (5, 6, 8).

5.4. Analysis of the students' answers/ Maslow's Hierarchy of Human Needs

Item	**Right Answer**		**Wrong Answer**		**No Answer**		**Total**
	N	*%*	N	*%*	N	*%*	
Physiological Needs	14	70	06	30	00	00	20
Physiological needs	16	80	04	20	00	00	20
Deficiency needs	09	45	11	55	00	00	20
Aesthetic	11	55	09	45	00	00	20
Self-actualization	14	70	06	30	00	00	20
Self-actualization	09	45	11	55	00	00	20
Self-actualization	09	45	09	45	02	10	20
Growth needs	12	60	07	35	01	05	20
Total	11,75	***58,75***	07,87	***39,37***	*0,37*	***01,87***	

Table 59:Summary Table of the Cloze Procedure Format (Maslow's theory of needs)



Graph 55: Summary Graph of the Cloze Procedure Format (Maslow's theory of needs)

The table indicates that the students' responses vary from one item to another, and even for the same item (the proportions of correct and/ or wrong responses are different for items that appear twice in the passage). The highest proportion of the learners' correct answer represents 80%, and the lowest proportion represents 45%, whereas the proportion of incorrect answers vary from 55% to 20%. We should state also that some students (between 10% and 5%) provided no answers for some items.

Overall, about 39,37% provided wrong answers against 58,75% who gave correct answers. And 1,87% had no answer.

	Wrong answers	N	*%*
Physiological needs	deficiency needs	05	**25**
	basic	01	**05**
	Total	06	***30***

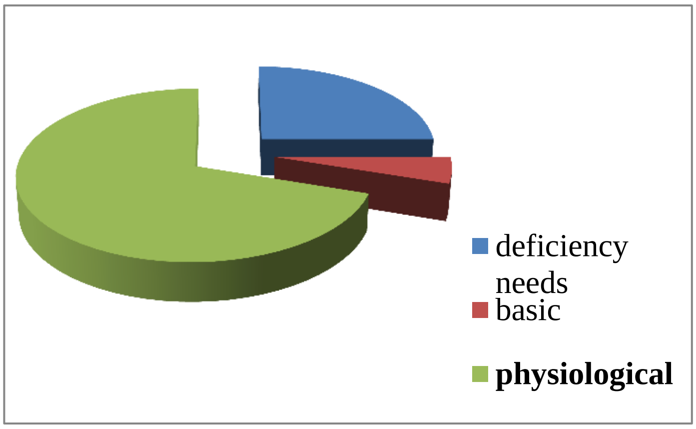


Table 60: Item 01: Physiological **Graph 56: Item 01: Physiological**

The information indicates that a number of 30% wrongly filled in the blank. Among them, 25% answered by 'deficiency needs' and a percentage of 5% answered by 'basic' which is not wrong but just not part of the terminology provided.

	Wrong answers	N	%
Physiological	deficiency needs	04	**20**
	Total	04	***20***

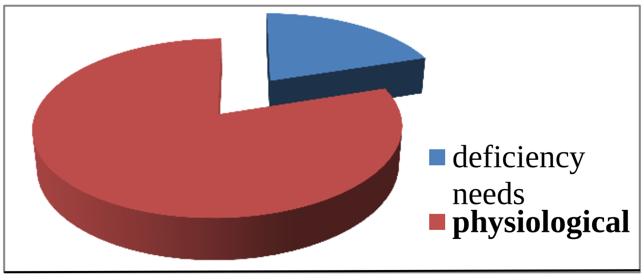


Table 61: Item 02: Physiological **Graph 57: Item 02: Physiological**

A proportion of 20% of the students' sample finds it difficult to deduce the right answer. The wrong answer they provided is 'deficiency needs'.

	Wrong answers	N	%
Deficiency needs	growth needs	03	**15**
	self-actualization	08	**40**
	Total	11	***55***

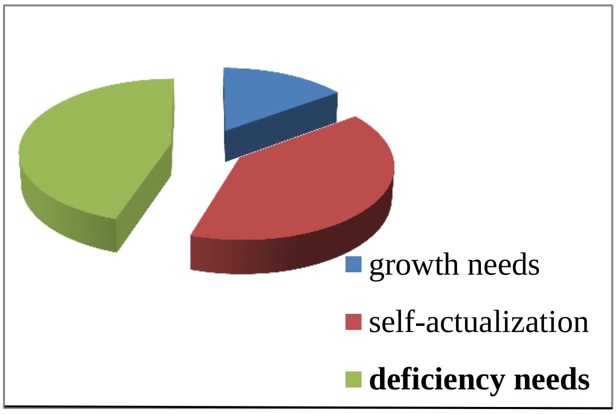


Table 62: Item 03: Deficiency needs **Graph 58: Item 03: Deficiency needs**

More than half of the sample (55%) chose the wrong items. While 40% gave 'self-actualization' as an answer, 15% inserted 'growth need' in the blank.

Aesthetic	**Wrong answers**	N	*%*
	deficiency needs	05	**25**
	growth needs	04	**20**
	Total	09	***45***

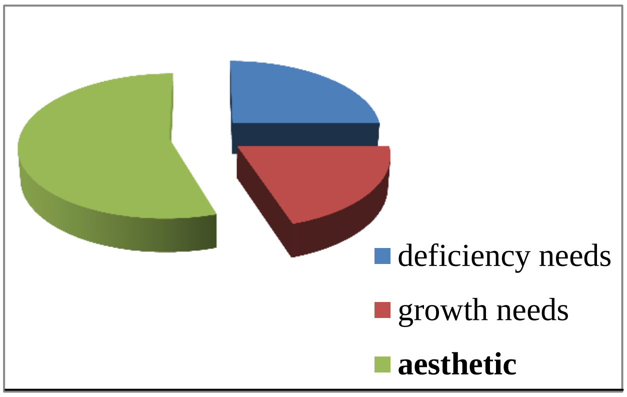


Table 63: Item 04: Aesthetic

Graph 59: Item 04: Aesthetic

The table shows that almost half of the students of the sample (45%) gave incorrect answers. 25% among them had ‘deficiency needs’ as an answer, and 20% filled in the blank with ‘growth needs’.

Self-actualization	**Wrong answers**	N	*%*
	aesthetic	04	**20**
	deficiency needs	01	**05**
	growth needs	01	**05**
	Total	06	***30***

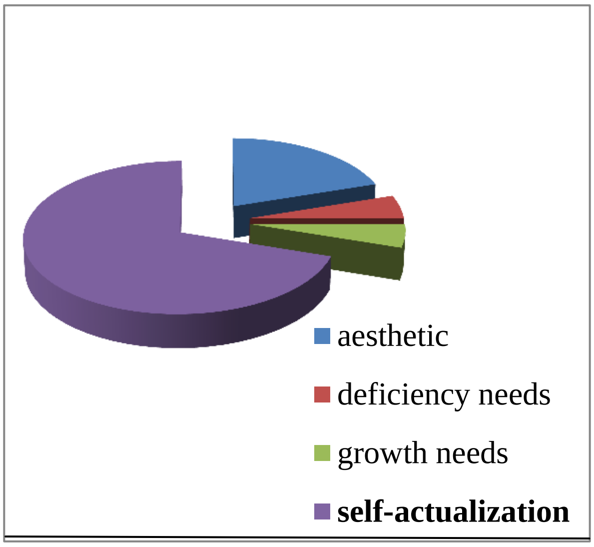


Table 64: Item 05: Self-actualization

Graph 60: Item 05: Self-actualization

For this item, 30% did not find the right answer. The highest proportion (20%) answered with ‘aesthetic’, and the same proportion (5%) answered with ‘deficiency needs’ and/ or ‘growth needs’.

Self-actualization	**Wrong answers**	N	*%*
	growth needs	04	**20**
	Aesthetic	06	**30**
	physiological	01	**05**
	Total	11	***55***

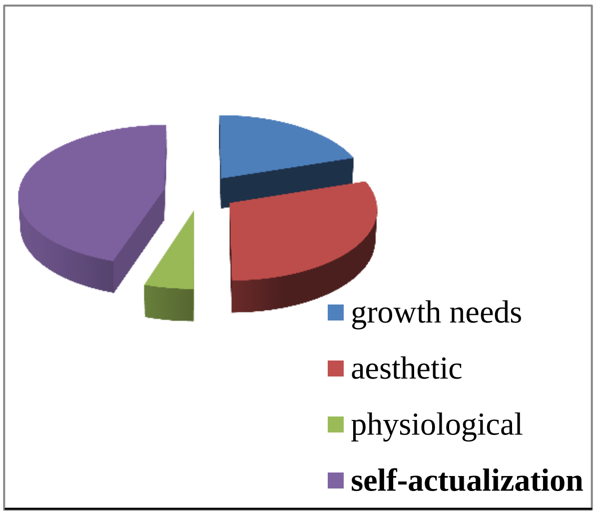


Table 65: Item 06: Self-actualization

Graph 61: Item 06: Self-actualization

Again, a bit more than half of the sample (55%) could not guess the right answer. 30% chose ‘aesthetic needs’. 20% opt for ‘growth needs’, while just 5% chose ‘physiological’.

Self-actualization	**Wrong answers**	N	*%*
	deficiency needs	05	**25**
	growth needs	02	**10**
	Aesthetic	02	**10**
	Total	09	***45***

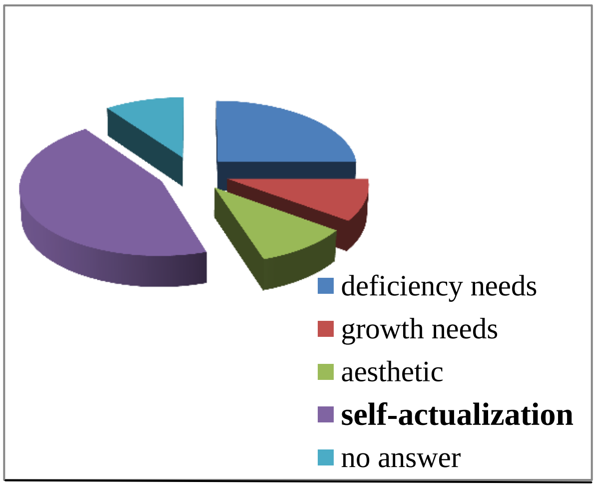


Table 66: Item 07: Self-actualization

Graph 62: Item 07: Self-actualization

A proportion that approximates half of the sample (45%) have been mistaken. 25% chose ‘deficiency needs’ to fill in the blank. And the same proportion (10%) gave ‘growth needs’ and/ or ‘aesthetic.

	Wrong answers	N	%
Growth needs	Self-actualization	04	**20**
	Aesthetic	03	**15**
	Total	07	***35***

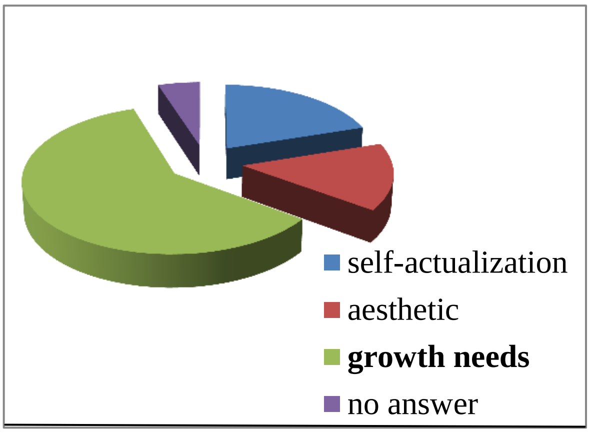


Table 67: Item 08: Growth needs

Graph 63: Item 08: Gowth needs

35% replaced the item whether by ‘self-actualization’ (for 20%), and/ or by ‘aesthetic’ (for 15%).

In general, we can say that, first; the vast majority of the students of the sample got the meaning of the notion of *physiological*. This is confirmed by a totality of 50% who gave wrong answers (for *physiological* as a first and second item”) but inserted ‘deficiency needs’ instead (that physiological needs belong to).

Secondly, and to some extent, the students confuse between the concepts of *deficiency needs*and *growth needs*. The former had the highest proportions as wrong answers (40% and 25%). It has been replaced by ‘growth needs’besides ‘self-actualization’ (here, self-actualization is part of growth needs).

5.5. Discussion of the Results

In their 5th semester university language studying, students are expected to reach the proficiency level that permits them to infer meanings of unknown words efficiently. The inference capacity, despite the easiness of the texts used in the study, requires a deeper understanding and processing of information. And since the students have been requested on terms they have learnt in the same lecture, and because of memory limited capacity (new information in working memory does not last beyond 15 seconds, so it decays if not activated or rehearsed), the omitted technical terms in the texts are provided so that the participants have better opportunities to recognize them and use their inferring capacities to come to a correct inference about the words' meanings. In other words, provided technical terms permit them to get access to what they already have in their memory.

Overall, the findings reveal a bit more than half of the participants (63, 06%) gave right responses while 34, 70% provided wrong answers. However, students have more wrong than right answers with the texts on **conditional stimuli** and **Piaget's formal operational stage**. This might be because there are difficulty differences between texts. For example, the former text, on conditioning, may be a bit more challenging as it involves an example about applying the principle of conditioning, other than Pavlov's experiment. Moreover, the students, may be, did not grasp well the terms' meanings, or they were tired, or the teacher failed to transmit the information to them. Again, they might be numerous unfamiliar, though simple words, in the texts to use their background knowledge, effectively, to infer word meaning. Unfamiliar words in a text inhibit L2 reading comprehension. The students who failed to make correct guesses might have bad memory capacities too, or have learnt the concepts yet are not ready to meet them in different contexts; terms' representations in their memories are not secure enough. Moreover, they, may be, have poor reading comprehension skills which make it difficult to use the clues in the texts.

Hosenfeld (1981) suggests the term *reading strategies* required to be used by the learners for reading comprehension. She claims that effective learners use a variety of sources and reading strategies to determine meaning:

> *"an efficient reader reads to identify meaning rather than words, takes chances in order to identify meaning, considers illustrations, evaluates guesses, uses a variety of types of context clues, and*

> *follows through with proposed solutions" (Hosenfeld, 1981; cited in Barnett, 1988, p. 110).*

Oxford (1990) considers learning strategies as learner's behaviour to simplify the process of learning when she says *"Learning strategies are specific actions taken by the learner to make learning easier, faster, more enjoyable, more self - directed, more effective..." (p. 8).* Moreover, Schmitt's (1997) defines VLS through the different memory processes *"The process by which information is obtained, stored, retrieved, and used" (p. 29).*While, according to Schmitt (1997), *"Vocabulary learning strategies could be any action which affects this rather broadly-defined process" (p. 203).* Similarly, Cameron (2001) relates it to memory and comprehension skills too: *"actions that learners take to help themselves understand and remember vocabulary" (p. 92).*

Concerning the linguistic sources, the students seem to rely mostly on contextual clues, or at least more than other clues (like background knowledge related to their knowledge of the word, associations, discourse knowledge), in working out the meaning of unfamiliar words. In other words, they relied on contextual support (explicituse of sentence and paragraph level context: clarification, example, cause/ effect, summary, etc). This might be because of the accessibility of this knowledge which involves the words' immediate co-text. Many division of knowledge sources has been mentioned in the theoretical part; Paribakht and Wesche's (1999) simplest division is as follows:

Extralinguistic source	Linguistic sources	
	Major	
Minor		
World knowledge	-sentence-level grammatical	-discourse/text
knowledge	-hyponymy	
	-word morphology	-word associations
	-punctuation	-cognates

Figure 5: Knowledge sources used in inferencing (Paribakht&Wesche, 1999)

Therefore, the students, in the study, seem to read the whole passage to form a general idea, instead of stopping at every single word, especially technical term meaning is not guessable from the individual words (it has semantic specification). Hence, the morphological (and the phonological) aspect could not help the learners infer the meanings of technical terms since the latter requires direct learning; knowledge of derivations is not useful because these terms are not guessable. This is apart from sub-technical terms which are minimally connected to particular fields, and in which the former aspect might have a very limited role in guessing the terms' meanings, like for the word *unlimited* (with 90% of correct responses), which is used in the field of Psychology of Education to talk about memory capacity, yet, used, by the same sense, in general language, and hence is easily understood out of the field. Other examples involve the word *five senses, adaptation, abstract, growth (needs)*, with 80%, 100%, 85%, and 60% correct answers successively.

As for grammar knowledge, the technical terms are all nouns that resist to alteration.

On the other hand, syntactic knowledge seems to work well. At the sentence level, many students might have relied on the semantic definitions of the terminology to provide a correct inference, like with the term *assimilation* which appears in the sentence *"(Assimilation)* is the process of understanding a new object...in terms of an existing scheme", in which the students reached 95% of correct answers. Also with the word *physiological*: "Maslow suggested that the first and most basic need people have is the need for survival: their *(physiological)* requirement for food, water, and shelter".

In addition to that, the role that memory (background knowledge) can play to help make successful guess is an undeniable factor. Despite the fact that memory has a limited capacity, students have more or less learnt definitional meanings via explanations through the lectures, what makes them familiar with the topics in the passages, and permits them to create background knowledge: semantic representations of the new concepts/ technical terms in our memory (a simulation of previous perceptual experience with the word's referent), as a knowledge source that influences lexical inference and its outcomes. These findings sustain the concept that beginning L2 readers with more exact and effective lexical representations show better lexical inferencing capacities, mainly because of the growing automatization of word reading, which releases resources for higher level processing. The findings propose that lexical inferencing from text in the L2 might be restricted not only by vocabulary knowledge and higher order comprehension processes, yet also by essential deciphering abilities (like text representation) (Prior, Goldina, Shany, Geva, & Katzir, 2014). However, for lexical inference, the role of these knowledge sources at different levels of L2 language proficiency remains an area of ongoing research.

Constructing textual meaning is dependent on using *the bottom-up* process starting by identifying small units of meaning like morphemes and words analysis which are combined, after that, until the entire text is understood. However, may be, because of the previous mentioned reasons, the students abandoned the *bottom-up* vocabulary inference strategy used to determine meaning. It seems that, in our case dealing with technical terms, it would be easier for the students to try to understand the whole passage (than reading the individual words separately) since they have background knowledge about it. This is called *the top-down process*, where the student form a general idea of the text before one proceeds to parse it to smaller units of meaning, through the use of contextual information and prior knowledge, to make predictions about the text. However, as mentioned in the theoretical part, none of the ('*top-down' and 'bottom-up"*) approaches can work alone, i.e. both the students' prior knowledge and linguistic knowledge/ clues are more or less used to in reading comprehension.

Conclusion

In order to learn about the students' inference capacities, rational cloze procedure activities, where the participants should have to recognize the omitted technical terms, are used. The results reveal that more than half of the answers are correct (63, 06%). Hence, inference is worth to be implemented in classrooms as a strategy used to teach technical words. In addition, the students, in inferring words' meanings, seem to rely more on contextual clues that involve background knowledge (related to word knowledge, associations, discourse), besides syntactic knowledge (semantic definitions). And since the participants have taken every lesson before answering the corresponding task, they, to some extent, have built background knowledge in the selected topics of the activities. Hence, the *top-down process* which involves contextual information and prior knowledge is utilized to make correct inference.

Chapter VI

Analysis of Pilot Study and Experiment: VST Pre and Post- tests Results of the Control and the Experimental Groups

Conclusion

Introduction

This chapter is mainly devoted to the description and the analysis of the experiment (and the pilot study) investigating the role of foreign language technical words in the acquisition of non-technical written receptive vocabulary. Both the experimental and the control groups are assigned the 14 000 version of the VST as a pre-test, while the post-test is presented in the same way by the end of the academic year, 2014. The results obtained are likely to add more understanding about how do learners acquire vocabulary.

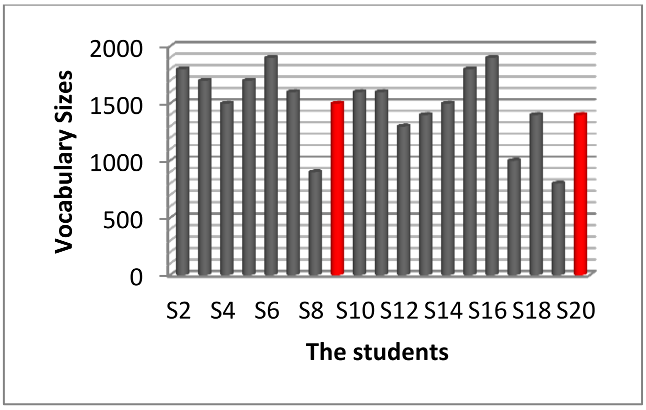
6.1. Analysis of the Pilot Study

Around the final week of November 2014, 14 000 version of the VST test is administered to a number of third year ESL class students (N= 20), at the University of Frères Mentouri/ Constantine1. The VST test (as a receptive test) measures whether or not students can provide meaning when they see the form of a word; i.e. if they have knowledge required for reading. The same group is administered the test after two months (by the first week of February 2014). The learners are given 40 minutes to complete the test. In addition, they are instructed to leave the room once they finish the test, to reduce distractions.

6.1.1. The VST (Vocabulary Size Test/ 14 000 version) Pre-test Results of the Pilot Study

	Scores (A)	Vocabulary Size (scores x 100)
S1	16	1600
S2	18	1800
S3	17	1700
S4	15	1500
S5	17	1700
S6	19	1900
S7	16	1600
S8	9	900
S9	15	1500
S10	16	1600
S11	16	1600
S12	13	1300
S13	14	1400
S14	15	1500
S15	18	1800
S16	19	1900
S17	10	1000
S18	14	1400
S19	8	800
S20	14	1400
Mean	*14,95*	***1495***

Table 68: The VST Pre-test Results of the Pilot Study



Graph 64: The VST Pre-test Results of the Pilot Study

In this pre-test, third year students, by the beginning of the college year, score between 8 and 19. This means that their vocabulary sizes range between 800 and 1900 words. The Mean = 1495, i.e. the students know on average 1495 receptive words.

Among the students, 2 (10%) have not reached the 1000 word families, 90% rate between 1000 and 2000 word families (≥ 1000 < 2000 word base), while none knows 2000 words.

6.1.1.1. Discussion of the VST Pre-test Results of the Pilot Study

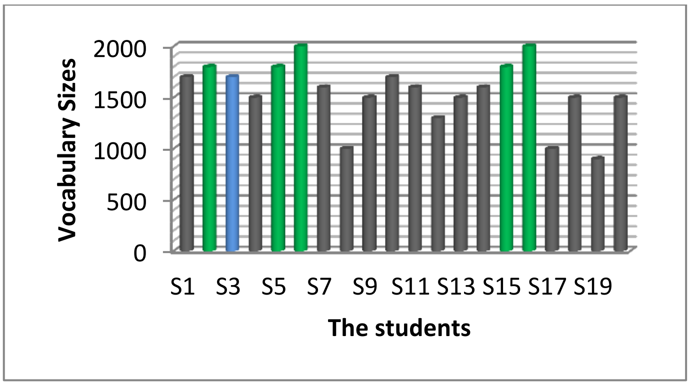
It seems that the majority of the students (90%) have not attained the 2000 most frequent English words. Their vocabulary sizes, ranging between 1000 and 2000 words, allow them to somehow take part in daily communication as they provide around 90% text coverage of spoken discourse. Yet, they present poor understanding of unscripted texts. From the other hand, these students' vocabulary knowledge offers less than 80% of written text coverage which makes written materials hard to understand to them, since it means that the students are unfamiliar with 20 words out of 100 words in any written text.

The two other students have not reached the 1000 word families (they know 800 and 900 words), which might permit them to communicate in English, while they have significant poor reading comprehension skills.

6.1.2. The VST (Vocabulary Size Test/ 14 000 version) Post-test Results of the Pilot Study

	Scores (B)	Vocabulary Size (scores x 100)
S1	17	1700
S2	18	1800
S3	17	1700
S4	15	1500
S5	18	1800
S6	20	2000
S7	16	1600
S8	10	1000
S9	15	1500
S10	17	1700
S11	16	1600
S12	13	1300
S13	15	1500
S14	16	1600
S15	18	1800
S16	20	2000
S17	10	1000
S18	15	1500
S19	9	900
S20	14	1400
Mean	*15,45*	***1545***

Table 69: The VST Post-test Results of the Pilot Study



Graph 65: The VST Post-test Results of the Pilot Study

The post-test results of the pilot study reveal a receptive vocabulary size averaging 1545 word families. Learners' vocabulary sizes vary between 900 and 2000 word families.

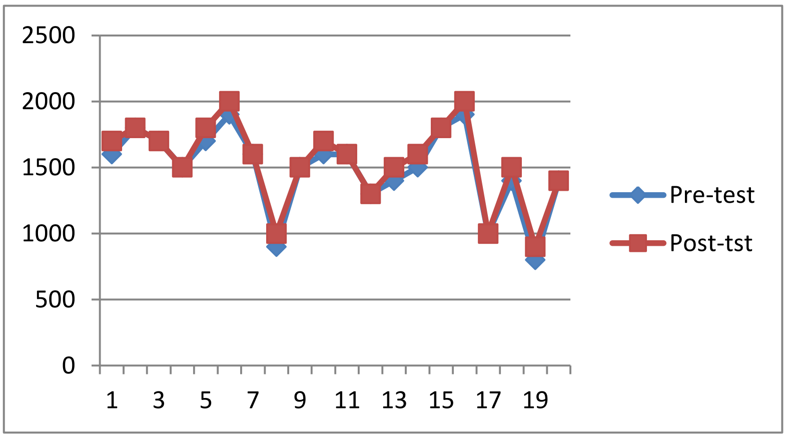
The majority of the students (95%) rate between 1000 and 2000 words (≥ 1000 < 2000), while 2 (10%) students have vocabulary sizes that equals 2000 words. And 1 (5%) learner knows less than 1000 words.

6.1.2.1. Discussion the VST Post-test Results of the Pilot Study

Again, almost all the students (95%) have not attained the 2000 most frequent English words (≥ 1000 > 2000). Their vocabulary knowledge allows them to somehow use English in communication while they are viewed as poor readers of spoken discourse. Also, the students' vocabulary knowledge does not permit reading comprehension. The student who have not reached the 1000 word families (knows 900 words) might be able to communicate in English.

As for the students who have reached 2000 word families, they have a better ability to communicate in English but cannot attain total understanding of spoken discourse. Moreover, they have difficulty understanding written texts.

6.1.3. Comparing the VST Pre-test and Post-test Results of the Pilot Study



Graph 66: Comparing the VST Pre-test and Post-test Results of the Pilot Study

$$\bar{B} - \bar{A} = \frac{\sum B}{N2} - \frac{\sum A}{N1}$$

= 15.45 – 14.95

= 0.50

0.50 x 100 ***= 50*** (the scores should be multiplied by 100 to find the vocabulary size).

Considering the students' scores in the post-test of the pilot study (after two months from the pre-test), there seems to be a progress, yet very slow, in their vocabulary knowledge. The highest size of the vocabulary learned equals to 100 word families. The students have added, on average, 50 words to their vocabulary knowledge.

In order to confirm this progress in the vocabulary knowledge, *t-test* for paired samples is used, since we measure the vocabulary size of the participants twice (repeated measures:

$$t_{N-1} = \frac{Difference\ between\ sample\ and\ population\ means}{Standard\ error\ of\ the\ mean}$$

where*N* is the sample size (number of ds) and *sd* is the standard deviation of the ds, and $N-1$ is the number of degrees of freedom.

6.1.3.1. General Procedure

1. Calculate the difference, d, between each pair of scores: ($X_1 - X_2$). Subtract consistently and be sure to record the minus signs.
2. Calculate the mean difference using:

$$\bar{d} = \frac{\sum d}{N}$$

3. Calculate the standard deviation of the differences using the formula:

$$S_d = \sqrt{\frac{\sum d^2}{N}} - \sqrt{\bar{d}^2}$$

4. Substitute the values of the mean difference the standard deviation of the differences (Sd), and the sample size (N) in the following formula and calculate t:

$$t_{N-1} = \frac{\bar{d}}{S_{d/\sqrt{N-1}}}$$

5. Find the critical value of *t* for the desired level of significance.

6.1.3.2. Presenting the Data

	Pilot Study			
	Pre-test scores (A)	Post-test scores (B)	D	d^2
S1	16	17	1	1
S2	18	18	0	0
S3	17	17	0	0
S4	15	15	0	0
S5	17	18	1	1
S6	19	20	1	1
S7	16	16	0	0
S8	9	10	1	1
S9	15	15	0	0
S10	16	17	1	1
S11	16	16	0	0
S12	13	13	0	0
S13	14	15	1	1
S14	15	16	1	1
S15	18	18	0	0
S16	19	20	1	1
S17	10	10	0	0
S18	14	15	1	1
S19	8	9	1	1
S20	14	14	0	0
			$\sum d = 10$ $\bar{d} = 0.5$	$\sum d^2 = 10$

Table 70: Comparing the Pre-test and Post-test Results of the Pilot Study

6.1.3.3. Computation of S_d, df, t

$$S_d = \sqrt{\frac{\sum d^2}{N}} - \sqrt{\bar{d}^2}$$

$$= \sqrt{\frac{10}{20}} - \sqrt{0,25}$$

$$= 0.70 - 0.5$$

$= \boldsymbol{0.2}$

$df = N-1$

$= 20 - 1$

$= \boldsymbol{19}$

$$t_{N-1} = \frac{\bar{d}}{S_{d/\sqrt{N-1}}}$$

$$= \frac{0.5}{0.2\ /\sqrt{19}}$$

$$= \frac{0.5}{0.04}$$

$= \boldsymbol{12.5}$

6.1.3.4. Finding the critical value of t in the t-ta*ble*

In order to find out the value of t, first we have to look for the value corresponding to 19 degrees of freedom for 0.05 level of significance. Miller's (2005) t table for one-tailed test (below) shows that there is no row for 19 degrees of freedom. Accordingly, Dietz and Kalof (2009) stated: Looking in the t-table, the critical value for an alpha level of 0.05 and 19 degrees of freedom is not listed. But we have *t* values for 17 and 29 degrees of freedom. *"It is always better to be cautions and use fewer degrees of freedom than we actually have." (p. 352).* Thus, the value 17 is our degree of freedom. The critical value of *t* required for 0.05 level of significance is 2.110. As for Miller (2005) the value (2.110) has to be divided by 2 for a one-tailed test. Hence, the critical value of *t* that will be compared to the calculated t is 1.055 (2.110÷2 = 1.55).

	Level of significance				Level of significance		
df	·10	·05	·02	df	·10	·05	·02
12	1·782	2·179	2·681	29	1·699	2·045	2·462
13	1·771	2·160	2·650	30	1·697	2·042	2·457
14	1·761	2·145	2·624				
15	1·753	2·131	2·602	40	1·684	2·021	2·423
				60	1·671	2·000	2·390
16	1·746	2·120	2·583	120	1·658	1·980	2·358
17	1·740	2·110	2·567		1·645	1·960	2·326

*For a one-tailed test the significance levels should be divided by 2.

Table 71 : T-table (Miller, 2005, p.141)

Thus, the calculated value of t is greater than 1.055 (12.5 > 1.055). Hence, there is a significant difference between the students' performance in the pre-test and post-test.

What is important about the results of this study is not only about how the students scored on the VST test, yet about how the procedures are used too. The main objective of the pilot study is to create a similar environment to that of the actual study, by means of which the accuracy of procedures would be tested. Hence, we can say that:

- Some of the students left the room very early (after 5 minutes). Hence, to make sure the learners would take the test seriously, and to have more accurate scores, they, in the actual study, are not allowed to leave the room and take the whole time required for the test.
- Moreover, in order that the students take the test more seriously, they are told that it is part of a research paper aiming mainly to try out the influence of lexical inference on improving SL vocabulary knowledge.
- The great majority of the participants have failed to answer the test as they attained the 4th level; where, for few students, the scores go down a lot. Hence, I decided to consider only the first three (3) levels of the VST test as it seems to fit the learners level of proficiency, especially that the latter (as well as my supervisor) judged the test to be difficult and long (two factors that attract boredom and arbitrary guessing that weakens the test's reliability); hence,

- 15 minutes are considered enough to complete the three first levels (the test). – In addition, it is worth mentioning that there is a lack of studies, in Algeria, used to test the vocabulary size of first or third year university students of English as a foreign language, provided that they have English as a module since they were in secondary school (for few hours of instruction per week). I kindly asked Professor John Read (whose main area of specialisation is language testing and assessment, and who was President of the International Language Testing Association (ILTA) for help in such matters. Dr. Read explained to me that some time ago one of his Masters students from Indonesia have measured the English vocabulary knowledge of learners after they are first year at her university (a situation like this is somewhat similar to mine as the learners have studied English for a few hours a week for six years in high school). On average, he says, the students know about 1200 receptive words. He adds: some other studies elsewhere have produced comparable figures, that this is related to written vocabulary, and that there has been little work of any kind on spoken vocabulary, so:

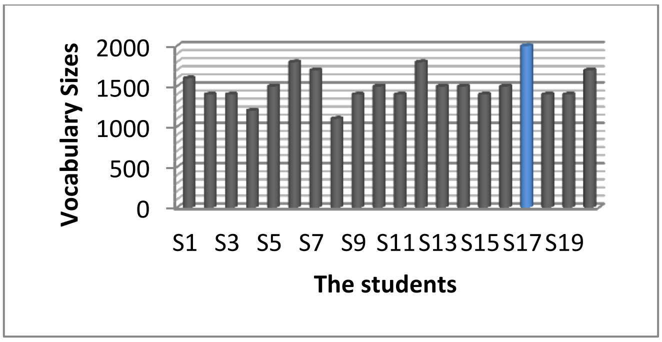
- Considering earlier studies, Dr. Read said, third year ESL university learners should have a reading vocabulary size of between 2000- 3000 words(J. Read, personal communication, May & June, 2013). Hence,
- 50 words learning average, in two months, demonstrated by the pilot study is considered low and very slow.

6.2. Analysis of the VST (Vocabulary Size Test/ 14 000 version) Pre-tests Results of the Experimental Group and the Control Group

6.2.1. The VST Pre-test Results of the Experimental Group

	Scores (X1)	Vocabulary Size (scores x 100)
S1	16	1600
S2	14	1400
S3	14	1400
S4	12	1200
S5	15	1500
S6	18	1800
S7	17	1700
S8	11	1100
S9	14	1400
S10	15	1500
S11	14	1400
S12	18	1800
S13	15	1500
S14	15	1500
S15	14	1400
S16	15	1500
S17	20	2000
S18	14	1400
S19	14	1400
S20	17	1700
Mean	*15,10*	***1510***

Table 72: The VST Pre-test Results of the Experimental Group



Graph 67: The VST Pre-test Results of the Experimental Group

Students of this group (the experimental group) know on average 1510 receptive words; the majority of them have vocabulary sizes ≥ 1000 < 2000 (95%), and only 1 student (5%) has reached the 2000 word families.

6.2.1.1. Discussion of the VST Pre-test Results of the Experimental Group

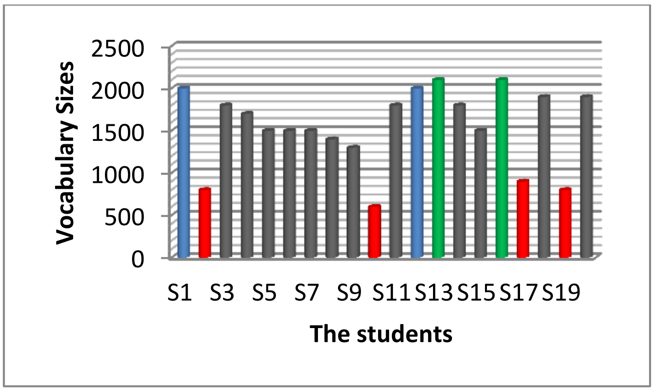
The results have shown that only one (1) learner is familiar with the 2000 most frequent words in English. This size provides around 90% text coverage of spoken discourse, which permits him to take part in everyday conversation. Yet, that student would have difficulty totally understand spoken discourse. As for reading comprehension, the 2000 word families offers 80% text coverage, the percentage at which text comprehension is almost impossible: it means that for 100 words in texts, 20 words are unknown.

Concerning the other students (95%) who have vocabulary sizes ≥1000 yet < 2000, written text comprehension is not possible. Likewise, the learners are more or less not familiar with unscripted texts.

6.2.2. The VST Pre-test Results of the Control Group

	Scores (Y1)	Vocabulary Size (scores x 100)
S1	20	2000
S2	8	800
S3	18	1800
S4	17	1700
S5	15	1500
S6	15	1500
S7	15	1500
S8	14	1400
S9	13	1300
S10	6	600
S11	18	1800
S12	20	2000
S13	21	2100
S14	18	1800
S15	15	1500
S16	21	2100
S17	9	900
S18	19	1900
S19	8	800
S20	19	1900
Mean	*15,45*	***1545***

Table 73: The VST Pre-test Results of the Control Group



Graph 68: The VST Pre-test Results of the Control Group

The students' lowest vocabulary size equals 600 words while the highest size represents 2100 word families. Among the students, 3 (20%) rate below 1000 words, 12 students (60%) rate between 1000 and 2000 words (≥1000 < 2000), while only 2 (10%)

have a vocabulary size that equals 2000, and the same percentage (10%) know more than 2000 words (=2100 words). The mean= 1545.

6.2.2.1. Discussion of the VST Pre-test Results of the Control Group

The results obtained demonstrate that the more than half the number of the participants (60%) have not reached the 2000 basic words in English; they had between 1000 and 2000 word families. These students are not expected to understand what they read as a vocabulary size below 2000 words provides around 75% text coverage of written discourse. However, they are supposed to manage to communicate somehow in English.

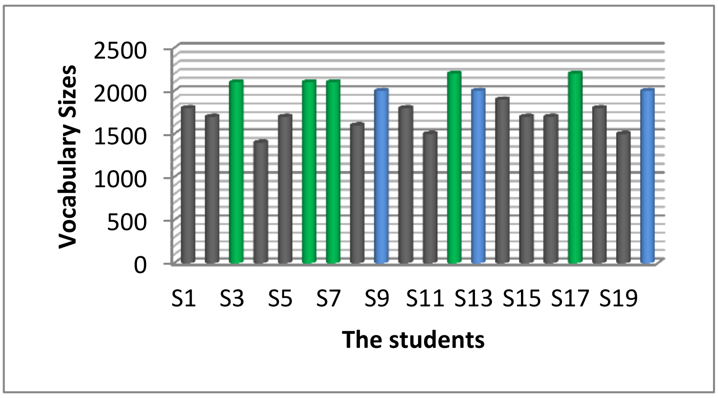
Moreover, the 4 students, in the group, who have reached the 2000 / 2100 words, have the minimum vocabulary size that permits them to use English; though they still view reading comprehension as a difficult task. The 3 students left rate below the 1000 word families. They have vocabulary sizes representing the AWL (= 570 words) which is highly frequent in English language academic texts, and permit 90% text coverage of academic or newspaper texts if added to the 2000 most frequent English words (some students can read adequately at this text coverage); that is to say, that list (2570 words) the understanding of written texts be increased by 10%.

6.3. Analysis of the VST (Vocabulary Size Test/ 14 000 version) Post-tests Results of the Experimental Group and the Control Group

6.3.1. The VST Post-test Results of the Experimental Group

	Scores (X2)	Vocabulary Size (scores x 100)
S1	18	1800
S2	17	1700
S3	21	2100
S4	14	1400
S5	17	1700
S6	21	2100
S7	21	2100
S8	16	1600
S9	20	2000
S10	18	1800
S11	15	1500
S12	22	2200
S13	20	2000
S14	19	1900
S15	17	1700
S16	17	1700
S17	22	2200
S18	18	1800
S19	15	1500
S20	20	2000
Mean	*18,35*	***1835***

Table 74: The VST Post-test Results of the Experimental Group



Graph 69: The VST Post-test Results of the Experimental Group

The receptive vocabulary size in the post-test of the experimental group averages 1835 words. It rates between 1400 and 2200 word base, with 12 students (60%) rating between 1000 and 2000 words, 3 (15%) students that have reached 2000 words, and 5 (25%) having oversized that latter figure.

6.3.1.1. Discussion of the VST Post-test Results of the Experimental Group

The post-test assigned to the experimental group of the experiment reveals 60% among the students know between 1000 and 2000 (< 2000 words), a size which more or less allows to participate in daily communication, while it does not permit to understand written texts.

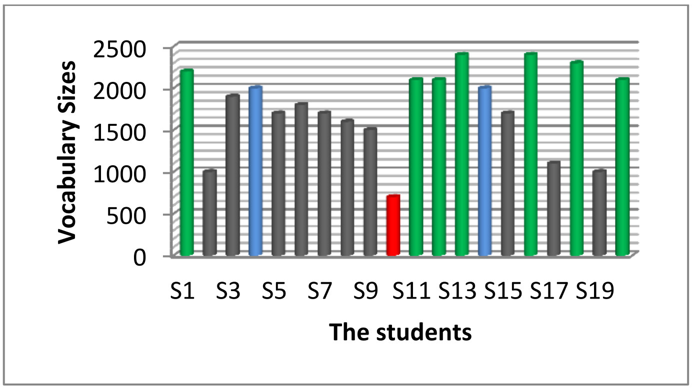
Moreover, 3 learners (15%) have reached 2000 word families that, again, would allow them to use the English language. Yet, the students are almost not able to get meaning from written materials.

Concerning the 5 students left, they, to a certain extent, have oversized the 2000 words (know between 2100 and 2200 word families) which provides them with text coverage a little more than 80%, i.e. the students would be able to use the language but could not attain adequate comprehension of written texts; they would find difficulty understanding what is written.

6.3.2. The VST Post-test Results of the Control Group

	Scores (Y2)	Vocabulary Size (scores x 100)
S1	22	2200
S2	10	1000
S3	19	1900
S4	20	2000
S5	17	1700
S6	18	1800
S7	17	1700
S8	16	1600
S9	15	1500
S10	7	700
S11	21	2100
S12	21	2100
S13	24	2400
S14	20	2000
S15	17	1700
S16	24	2400
S17	11	1100
S18	23	2300
S19	10	1000
S20	21	2100
Mean	*17,65*	***1765***

Table 75: The VST Post-test Results of the Control Group



Graph 70: The VST Post-test Results of the Control Group

The results of the post-test related to the Control group show a receptive vocabulary size averaging 1765 word families. Vocabulary sizes range between 700 and 2400 words. Among the students, 1 (5%) have less than 1000 words, 10 (50%) rate between 1000 and

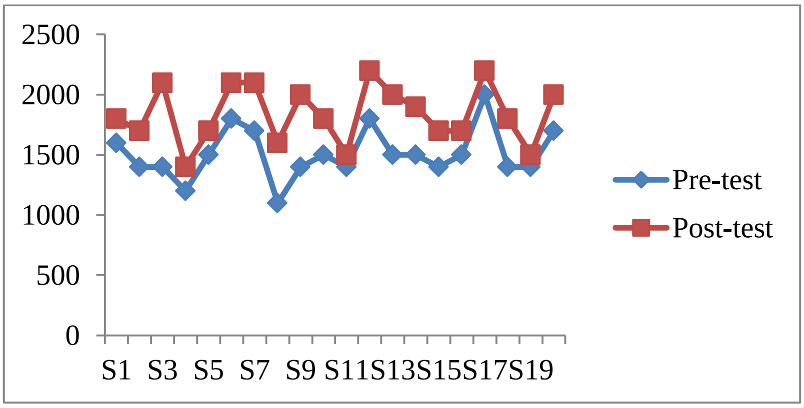
2000 word base (≥1000 < 2000), 2 (10%) have reached 2000 words, while 7 students (30%) know more than 2000 words receptively.

6.3.2.1. Discussion of the VST Post-test Results of the Control Group

Among the post-control participants, the 10 learners (50%) who have word knowledge between 1000 and 2000 (< 2000) are expected to be able, to a certain extent, to talk in English, while they are almost not being capable of understanding what they read. However there are two students who have attained 2000 words, a size which permit them to communicate in English while reading is still considered to be a hard task to them. Again, there are 7 (30%) among the students who, comparing to their peers, are supposed to be able to use English in conversation and can have a better understanding of unscripted texts, as they get over 2000 words size (from 2100 to 2400 word families). In addition, the students might reach 90% text coverage of written discourse which allows some of them to read adequately while it allows some others to gain, limited, reading comprehension.

6.4. Comparing the VST Pre-test and Post-test Results of both the Experimental and the Control Groups of the Study

6.4.1. Comparing the VST Pre-test and Post-test Results of the Experimental Group



Graph 71: Comparing the VST Pre-test and Post-test Results of the Experimental Group

The experimental group in this experiment have witnessed an enhancement in the overall receptive vocabulary size. Students have added, at maximum, 700 word families and 100 words minimally. On average, the increase is 325 word families within almost the two semesters. As shown previously in the tables:

$$\overline{X}_1 = \frac{\sum X1}{N}$$

$$= \frac{302}{20}$$

$$= \boldsymbol{15.10}$$

$$\overline{X2} = \frac{367}{20}$$

$$= \boldsymbol{18.35}$$

$$\overline{X2} - \overline{X1} = 18.35 - 15.10$$

$$= \boldsymbol{3.25}$$

3.25 x 100 = ***325***(the scores should be multiplied by 100 to find the vocabulary size).

In order to confirm this progress in the vocabulary knowledge, t-test for paired samples is used:

$$t_{N-1} = \frac{Difference\ between\ sample\ and\ population\ means}{Standard\ error\ of\ the\ mean}$$

where$N$ is the sample size (number of ds) and $S_d$is the standard deviation of the ds, and $N-1$ is the number of degrees of freedom.

6.4.1.1. Presenting the Data

	Experimental Group			
	Pre-test scores (X1)	Post-test scores (X2)	D	d^2
S1	16	18	2	4
S2	14	17	3	9
S3	14	21	7	49
S4	12	14	2	4
S5	15	17	2	4
S6	18	21	3	9
S7	17	21	4	16
S8	11	16	5	25
S9	14	20	6	36
S10	15	18	3	9
S11	14	15	1	1
S12	18	22	4	16
S13	15	20	5	25
S14	15	19	4	16
S15	14	17	3	9
S16	15	17	2	4
S17	20	22	2	4
S18	14	18	4	16
S19	14	15	1	1
S20	17	20	3	9
			$\sum d = 66$ $\overline{d} = 3.3$	$\sum d^2 = 266$

Table 76: The Experimental Group VST Pre-test and Post-test Grades

4.1.2. Computation of S_d df, t

$$S_d = \sqrt{\frac{\sum d^2}{N}} - \sqrt{\bar{d}^2}$$

$$= \sqrt{\frac{266}{20}} - \sqrt{10.89}$$

$$= 3.64 - 3.3$$

$$= \boldsymbol{0.34}$$

$df = N - 1$

$= 20 - 1$

= ***19***

$$t_{N-1} = \frac{\bar{d}}{S_{d/\sqrt{N-1}}}$$

$$= \frac{3.3}{0.34\ /\sqrt{19}}$$

$$= \frac{3.3}{0.07}$$

= ***47.14***

6.4.1.3. Finding the critical value of t in the t-table

In order to find out the value of t, first we have to look for the value corresponding to 19 degrees of freedom for 0.05 level of significance. Miller's (2005) t table for one-tailed test (below) shows that there is no row for 19 degrees of freedom but we have *t* values for 17 and 29 degrees of freedom. Thus, the value 17 is our degree of freedom. The critical value of *t* required for 0.05 level of significance is 2.110. Hence, the critical value of t that will be compared to the calculated t is 1.055 (2.110÷2 = 1.055).

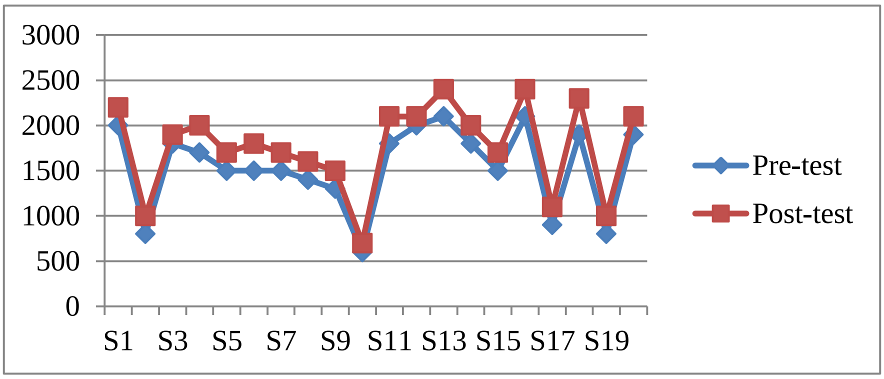
	Level of significance				Level of significance		
df	·10	·05	·02	df	·10	·05	·02
12	1·782	2·179	2·681	29	1·699	2·045	2·462
13	1·771	2·160	2·650	30	1·697	2·042	2·457
14	1·761	2·145	2·624				
15	1·753	2·131	2·602	40	1·684	2·021	2·423
				60	1·671	2·000	2·390
16	1·746	2·120	2·583	120	1·658	1·980	2·358
17	1·740	2·110	2·567		1·645	1·960	2·326

*For a one-tailed test the significance levels should be divided by 2.

Table 77 : T-table (Miller, 2005, p.141)

Thus, the calculated value of t is greater than 1.055 (47.14 > 1.055). Hence, there is a significant difference between the experimental students' performance in the pre-test and post-test .

6.4.2. Comparing the VST Pre-test and Post-test Results of the Control Group



Graph 72: Comparing the VST Pre-test and Post-test Results of the Control Group

Concerning the control group, the students have gained on average 220 more word families by the end of the year. They have generally added between 300 and 100 words, while one among them have gained 400 word base. In the following how the average number of learned words has been calculated:

$$\overline{Y1} = \frac{\sum Y1}{N}$$

$$= \frac{309}{20}$$

$$= \boldsymbol{15.45}$$

$$\overline{Y2} = \frac{\sum Y2}{N}$$

$$= \frac{353}{20}$$

$$= \boldsymbol{17.65}$$

$$\overline{Y_2} - \overline{Y_1} = 17.65 - 15.45$$

$$= \boldsymbol{2.20}$$

2.20 X 100 = ***220***(the scores should be multiplied by 100 to find the vocabulary size).

In order to confirm this progress in the vocabulary knowledge, t-test for paired samples is used:

$$t_{N\text{ -}1} = \frac{Difference\ between\ sample\ and\ population\ means}{Standard\ error\ of\ the\ mean}$$

where*N* is the sample size (number of ds) and *sd* is the standard deviation of the ds, and $N-1$ is the number of degrees of freedom.

6.4.2.1. Presenting the Data

	Control Group			
	Pre-test scores (Y1)	Post-test scores (Y2)	D	d^2
S1	20	22	2	4
S2	8	10	2	4
S3	18	19	1	1
S4	17	20	3	9
S5	15	17	2	4
S6	15	18	3	9
S7	15	17	2	4
S8	14	16	2	4
S9	13	15	2	4
S10	6	7	1	1
S11	18	21	3	9
S12	20	21	1	1
S13	21	24	3	9
S14	18	20	2	4
S15	15	17	2	4
S16	21	24	3	9
S17	9	11	2	4
S18	19	23	4	16
S19	8	10	2	4
S20	19	21	2	4
			$\sum d = 44$ $\bar{d} = 2.2$	$\sum d^2 = 108$

Table 78: the Control Group VST Pre-test and Post-test Grades

6.4.2.2. Computation of S_d df, t

$$S_d = \sqrt{\frac{\sum d^2}{N}} - \sqrt{\bar{d}^2}$$

$= \sqrt{\frac{108}{20}} - \sqrt{4.84}$

= 5.4 – 2.2

= ***3.2***

df =N-1

= 20 – 1

= ***19***

$$t_{N\text{-}1} = \frac{\bar{d}}{S_{d/\sqrt{N-1}}}$$

$$= \frac{2.2}{3.2/\sqrt{19}}$$

$$= \frac{2.2}{0.73}$$

= ***3.01***

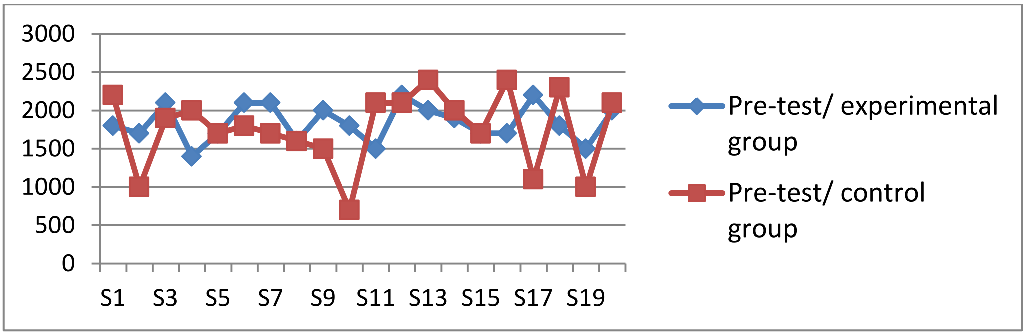
6.4.2.3. Finding the critical value of t in the t-table

Looking in the t-table, the critical value for an alpha level of 0.05 and the degree of freedom 17 (since the 19 degrees of freedom is not listed). The critical value of *t* required for 0.05 level of significance is 1.055 (2.110÷2 = 1.055). This is the same as for the t-test used for the experimental group.

Thus, the calculated value of *t* is greater than 1.055 (3.03 > 1.055). Hence, there is a significant difference between the students' performance in the pre-test and post-test.

6.5. Comparing the VST Pre-tests and Post-tests Results of both the Experimental and the Control Groups of the Study

6.5.1. Comparing the VST Pre-tests Results of both the Experimental and the Control Groups



Graph 73: Comparing the VST Pre-tests Results of the Experimental and the Control Groups

The graph reveals a fluctuation in the scores of the pre-test for both groups; they vary between 800 and 2100 word families. However, the scores provide an assurance of equivalence; the Means for the two of them are approximate:

$\overline{Y1}$ = ***15.45*** (1545 word families), while $\overline{X1}$ = ***15.10*** (1510 word families).

In order to confirm this equivalence, t-test for independent samples was used:

6.5.1.1. T-test procedure

In order to scrutinise the effect that technical terms' inference might have on the enhancement of general EFL receptive words a t-test was employed, as the most powerful statistical tests, to draw statistical inferences about the data. Since the experiment in the study employs the control group and the experimental group, which receives the treatment, the two groups are independent.

Miller (2005) suggests the following general procedure for the computation of the t-test for independent samples (one-tailed):

1. Calculate the two groups' means: $\overline{y1}$ (control group) and $\overline{x1}$ (experimental group).

2. Compute the3. Substitute the values of $\overline{Y}_1$, $\overline{X}_1$(control group), S_1^2, S_2^2, N1, N2 to calculate *t* using the following formula:

two groups' variances: S_1^2 and S_2^2.

$$t_{N1+N2-2} = \frac{(\overline{x}1 - y\overline{\iota})\sqrt{(N\iota + N2 - 2)N\iota N2}}{\sqrt{N\iota S\iota^2 + N2\ S2^2\ (N\iota + N2)}}$$

4. Find the number of degrees of freedom: df.

5. Using Miller's t-table, find the value of *t* required for the chosen level of significance. Finding it depends on the number of degrees of freedom and whether the test is one-tailed or two-tailed.

6. If the calculated *t* is equal or greater than the value of *t* found in t-table then we can reject the null hypothesis in favour of the alternate one.

6.5.1.2. Presenting the Data

The data used for the computation are the scores obtained from the post-test of both the Experimental and the Control groups.

	Control Group		Experimental Group	
N	Y1	$Y1^2$	X1	$X1^2$
S1	20	400	16	256
S2	8	64	14	196
S3	18	324	14	196
S4	17	289	12	144
S5	15	225	15	225
S6	15	225	18	324
S7	15	225	17	289
S8	14	196	11	121
S9	13	169	14	196
S10	6	36	15	225
S11	18	324	14	196
S12	20	400	18	324
S13	21	441	15	225
S14	18	324	15	225
S15	15	225	14	196
S16	21	441	15	225
S17	9	81	20	400
S18	19	361	14	196
S19	8	64	14	196
S20	19	361	17	289
Total	$\sum \mathbf{Y1} = \mathbf{309}$ $\overline{\mathbf{Y}}_{\mathbf{1}} = \mathbf{15.45}$	$\sum \mathbf{Y1^2} = \mathbf{5175}$	$\sum \mathbf{X1} = \mathbf{302}$ $\overline{\mathbf{X}}_{\mathbf{1}} = \mathbf{15.1}$	$\sum \mathbf{X1^2}$ $= \mathbf{4644}$

Table 79: The Experimental and Control Groups Pre-test Grades

6.5.1.3. Computation of the Means, Variance, t and df

1- Calculating the Means ($\overline{x}$) of the Experimental and the Control Group

To find the means($\overline{x}$), the formula: $\overline{x} = \frac{\sum X}{N}$ was used.

* For the experimental group, the sum of the students' grades ($\sum X1 = 302$) was divided by the number of the students (N1= 20). Making the substitution we found:

$$\overline{X1} = \frac{\sum X1}{N1} = \frac{302}{20} = \boldsymbol{15.45}$$

* For the control group, the sum of the students' grades ($\sum Y1 = 309$) was divided by the number of the students (N2= 20). Making the substitution we found:

$$\overline{Y1} = \frac{\sum Y1}{N2} = \frac{309}{20} = \boldsymbol{15.1}$$

2- Calculating the Variances $S1^2$ and $S2^2$

To find the variances of both groups, the following formulae were used:

$$S1^2 = \frac{\sum X1^2}{N1} - \overline{X1}^2 \text{ (Experimental Group)}$$

$$S2^2 = \frac{\sum Y1^2}{N2} - \overline{Y1}^2 \text{ (Control Group)}$$

Making the substitution from table it was found:

$$S_1^2 = = \frac{4644}{20} - 15.1^2 = \boldsymbol{4.19}$$

$$S_2^2 = = \frac{5175}{20} - 15.45^2 = \boldsymbol{20.05}$$

3- Computing t

To calculate t, the following formula was used and the right substitutions of the previously figured values: $\overline{X}1$ (experimental group), $\overline{Y}1$ (control group), N1, N2, S_1^2 and $S2^2$ were made.

$$t_{N1+N2-2} = \frac{(\bar{x}1 - \overline{Y1})\sqrt{(N1+N2-2)N1N2}}{\sqrt{(N1S1^2 + N2S2^2)(N1+N2)}}$$

$$= \frac{(15.1-15.45)\sqrt{(20+20-2)20x20}}{\sqrt{(20x20{,}05+20x4.19)(20+20)}}$$

$$= \frac{(0{,}35)\sqrt{38x400}}{\sqrt{(401+83.8)40}}$$

$$= \frac{0{,}35x\ 123{,}28}{\sqrt{19\ 394}}$$

$$= \frac{43.14}{139{,}26}$$

= -0,3

4- Calculating df (degree of freedom)

To find the value of the degree of freedom, the following formula was used:

$df = N_1 + N2 - 2$

$= 20 + 20 - 2$

$=$ ***38***

The df value (38) is used to read the t-table to figure out the critical value of t.

5- Finding the critical value of t in the t-table

For the purpose to find out the value of t, first we have to look for the value corresponding to 38 degrees of freedom for 0.05 level of significance. Miller's (2005) t table for one-tailed test (below) shows that there is no row for 38 degrees of freedom. We have *t* values for 30 and 60 degrees of freedom. Thus, the value 30 is our degree of freedom. The critical value of *t* required for 0.05 level of significance is 2.042; 2.042÷2 = 1.021.

	Level of significance				Level of significance		
df	·10	·05	·02	df	·10	·05	·02
12	1·782	2·179	2·681	29	1·699	2·045	2·462
13	1·771	2·160	2·650	30	1·697	2·042	2·457
14	1·761	2·145	2·624				
15	1·753	2·131	2·602	40	1·684	2·021	2·423
				60	1·671	2·000	2·390
16	1·746	2·120	2·583	120	1·658	1·980	2·358
17	1·740	2·110	2·567		1·645	1·960	2·326

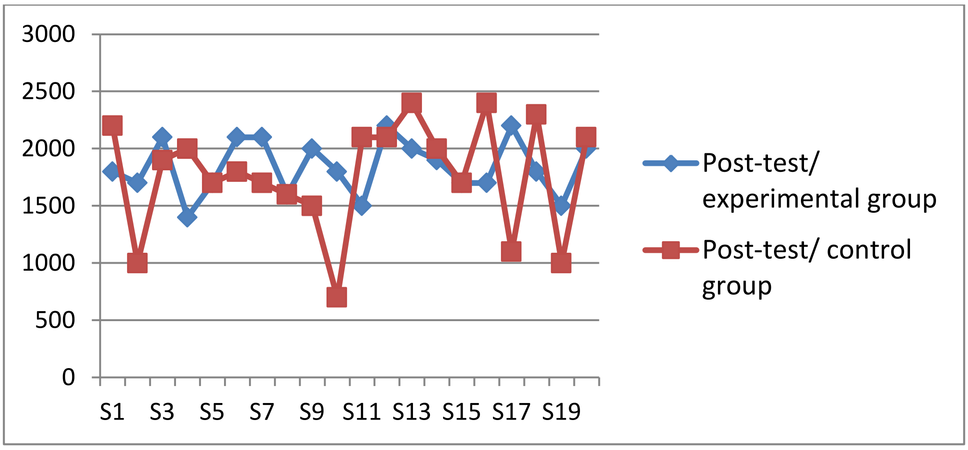
*For a one-tailed test the significance levels should be divided by 2.

Table 80: T-table (Miller, 2005, p.141)

6.5.1.4. Discussion of the Results

After the computations (means, variances, *t* and *df*) were carried out, the observed/calculated value of t of the experiment was found to be smaller than the critical value of *t* (0.3 < 1.021). A conclusion could be made that we accept the null hypothesis (H_0); i.e, the means of the two groups are approximate (or equal).

6.5.2. Comparing the VST Post-tests Results of the Experimental and the Control Groups



Graph 74: Comparing the VST Post-tests Results of the Experimental and the Control Groups

Again, there seems to be a noticeable variability in the scores of the post-test for both groups; they vary between 700 and 2400 word families. The Mean for the two of them are not far off: $\overline{X}2$= 18.35 (1835 words), while $\overline{Y}2$ = 17.65 (1765 words).

6.5.2.1. Presenting the Data

The data used for the computation are the scores obtained from the post-test of both the Experimental and the Control groups.

	Control Group		Experimental Group	
N	Y2	$Y2^2$	X2	$X2^2$
S1	22	484	18	324
S2	10	100	17	289
S3	19	361	21	441
S4	20	400	14	196
S5	17	289	17	289
S6	18	324	21	441
S7	17	289	21	441
S8	16	256	16	256
S9	15	225	20	400
S10	7	49	18	324
S11	21	441	15	225
S12	21	441	22	484
S13	24	576	20	400
S14	20	400	19	361
S15	17	289	17	289
S16	24	576	17	289
S17	11	121	22	484
S18	23	529	18	324
S19	10	100	15	225
S20	21	441	20	400
Total	$\sum \mathbf{Y2} = \mathbf{353}$ $\overline{\mathbf{Y2}} = \mathbf{17{,}65}$	$\sum \mathbf{Y2^2} = \mathbf{6691}$	$\sum \mathbf{X2} = \mathbf{367}$ $\overline{\mathbf{X2}} = \mathbf{18{,}35}$	$\sum \mathbf{X2^2} = \mathbf{6882}$

Table 81: The Experimental and Control Groups Post-test Grades

6.5.2.2. Computation of the Means, Variance, t and df

1- Calculating the Means($\overline{x}$)of the Experimental and the Control Group

To find the means($\overline{x}$), the formula: $\overline{x} = \frac{\sum X}{N}$was used.

* For the control group, the sum of the students' grades ($\sum Y2 = 353$) was divided by the number of the students (N1= 20). Making the substitution we found:

$$\overline{Y2} = \frac{\sum Y2}{N1} = \frac{353}{20} = \boldsymbol{17{,}65}$$

* For the experimental group, the sum of the students' grades ($\sum X2 = 367$) was divided by the number of the students (N2= 20). Making the substitution we found:

$$\overline{X2} = \frac{\sum X2}{N2} = \frac{367}{20} = \boldsymbol{18{,}35}$$

2- Calculating the Variances S_1^2 and $S2^2$

To find the variances of both groups, the following formulae were used:

$$S_1^2 = \frac{\sum x1^2}{N1} - \overline{X_1}^2 \text{ (Experimental Group)}$$

$$S2^2 = \frac{\sum Y2^2}{N2} - \overline{Y2}^2 \text{ (Control Group)}$$

Making the substitution from table it was found:

$$S_1^2 = = \frac{6882}{20} - 18{,}35^2 = \boldsymbol{7{,}38}$$

$$S_2^2 = = \frac{6691}{20} - 17{,}65^2 = \boldsymbol{23{,}02}$$

3- Computing t

To calculate *t*, the following formula was used and the right substitutions of the previously figured values: $\bar{x}2$ (experimental group), $\overline{y}2$ (control group), N1, N2, S_1^2 and $S2^2$ were made.

$$t_{N1+N2-2} = \frac{(\bar{x}2-\overline{Y2})\sqrt{(N1+N2-2)N1N2}}{\sqrt{(N1S1^2+N2S2^2)(N1+N2)}}$$

$$= \frac{(18{,}35-17{,}65)\sqrt{(20+20-2)20x20}}{\sqrt{(20x23{,}02+20x7{,}38)(20+20)}}$$

$$= \frac{(0{,}7)\sqrt{38x400}}{\sqrt{(460{,}4+147{,}6)40}}$$

$$= \frac{0{,}7x\ 123{,}28}{155{,}94}$$

$$= \frac{86{,}29}{155{,}94}$$

= 0,55

4- Calculating df (degree of freedom)

To find the value of the degree of freedom, the following formula was used:

$$df = N_1 + N2 - 2$$

$$= 20 + 20 - 2 = \boldsymbol{38}$$

The df value (38) is used to read the t-table to figure out the critical value of *t*.

5- Finding the critical value of *t* in the t-table

In order to find out the value of *t*, first we have to look for the value corresponding to 38 degrees of freedom for 0.05 level of significance. We have *t* values for 30 and 40 degrees of freedom. Thus, we take value 30. The critical value of t required for 0.05 level of significance is 2.042. 2.042÷2 = 1.021 (for a one-tailed test). Hence, the critical value of *t* that will be compared to the calculated t is 1.021.

	Level of significance					Level of significance	
df	·10	·05	·02	df	·10	·05	·02
12	1·782	2·179	2·681	29	1·699	2·045	2·462
13	1·771	2·160	2·650	30	1·697	2·042	2·457
14	1·761	2·145	2·624				
15	1·753	2·131	2·602	40	1·684	2·021	2·423
				60	1·671	2·000	2·390
16	1·746	2·120	2·583	120	1·658	1·980	2·358
17	1·740	2·110	2·567		1·645	1·960	2·326

*For a one-tailed test the significance levels should be divided by 2.

Table 82: T-table (Miller, 2005, p.141)

6.5.2.3. Discussion of the Results

In order to scrutinise the effect that technical terms' inference might have on the enhancement of general EFL receptive words, a *t-test* is employed, as the most powerful statistical tests, to draw statistical inferences about the data. After the computations (means, variances, *t* and *df*) are carried out, the observed/calculated value of t of the experiment is found to be smaller than the critical value of *t* (0.55 < 1.021). Hence, a conclusion could be made that we accept the null hypothesis (H_0) which rejects the effect of the independent variable (terminology inference) on the dependent variable (EFL non-technical written receptive vocabulary learning).

6.5.3. Discussion of the Comparison between VST Pre-test and Post-test Results of Both the Experimental and the Control Groups

The vocabulary size results of the experimental group and the control group of the study show that within two semesters, the increase was 325, and 220 word families, respectively. The table below summarizes the findings:

	The vocabulary size		The increase in the vocabulary Size
	Pre-test	Post-test	
The experimental group	1510	1835	325
The control group	1545	1765	220

Table 83: Summary Table of the VST Pre-tests and Post-tests Results' Findings of Both the Experimental and the Control Group

In order to make sense of these vocabulary sizes, we have to answer the questions: (1) How many words Algerian EFL students of Constantine1 University should attain to read their school texts (2) ?

Can Algerian third year EFL university students acquire a receptive vocabulary size similar to that of native speakers?

Pondering on the different researches mentioned mainly in the methodology chapter, on receptive vocabulary size and lexical coverage of written (and spoken) discourse, would answer the first question. The following is a summary of the most important and useful points:

The researches above seem to agree on certain points, but not on others. What Nation (2006) considers adequate reading comprehension seems to correlate with Laufer and Ravenhorst-Kalovski (2010) optimal threshold. The latter is estimated to be around 8000 word families, with lexical coverage of 98%; yet, 4000-5000 word families are acceptable/ required to attain 95% coverage of both written and spoken English discourse. This is agreed by Nation, Laufer and Ravenhorst-Kalovski. 95% text coverage is the point at which learners can read without the assistance of dictionaries (Bogaards & Laufer, 2004; Word engine, 2017). Moreover, Laufer (1992) reveals that the 3000 word families are a minimal vocabulary level to read successfully. Also, Nation research shows that the 2000 most frequent word families' knowledge provide 80% coverage of written (and spoken) discourse. This is agreed upon by bogaards and laufer (2004); also by Francis and Kucera (1982) through their scrutiny. However, at this text coverage, comprehension is almost impossible.

Both Staehr and Nation (in Chapter IV) make the point that the vocabulary required for written English is larger than that required to understand spoken English. Yet, Staehr's study also shows that learners may attain scores more than average on reading and listening comprehension tests without the estimated vocabulary size; this could imply that less than basic vocabulary size is sufficient. Hence, more precise definition of 'adequate comprehension' is needed.

All the findings in the above researches ended up that vocabulary acquisition beyond the 2000 word level is indeed required for basic understanding of any English text. Schmitt (2000) claims: *"The learning of these basic words cannot be left to chance, but should be taught as quickly as possible, because they open [...] the door of further learning" (p. 137).*

Concerning the second question, on contrasting the vocabulary size of native and non-native speakers, it has been found, as mentioned in the theoretical part, that English native university graduates have a set of vocabulary that ranges between 16 000 to 20 000, and that the latter are estimated to add a mean of 1000 word families to their vocabulary per year. Zechmeister et al. (1995) research shows that the receptive vocabulary size of college native English speaker is about 17 000 word families. Nation and Waring (1997) reach the conclusion that the receptive vocabulary size of English natives is about 20 000 words. Whereas Goulden, Nation, and Read's (1990) found that the average of university natives is of 17 000 words (Mokhtar et al., 2010).

Schmitt (2000) considers that the above aims (adding 1000 word families per year) are controllable for non-native speakers of English (mentioned in the literature review).

Moreover, Cervatiuc's (2007) research shows that the average receptive vocabulary size of competent university EFL English speakers goes from 13 500 to 20 000 word families; this outcome is similar to university native English speakers' vocabulary size which is approximately 17 000 word families. In addition, Meara's (1995) study finding indicates that adult learners of English as a second language could learn 2650 base words per year. This rate would permit adult learners of English as a second language to attain a native English vocabulary size of 17 200 base words in 6.49 years (Mokhtar et al., 2010).

The data in the previous paragraph show that developing a native vocabulary size can be possible for second language learners (Schmitt, 2000). Goulden, Nation, *and Read* (1990) consider that it would be more accurate that the median educated native speaker of English knows approximately 17 000 words at the rate of around 2 to 3 words per day:

> *It is more likely that the average educated native speaker has a vocabulary of around 17,000 base words and has acquired them at the average rate of about two or three words per day. If native speakers do in fact acquire vocabulary at this relatively slow rate, it would seem that for second language learners, direct teaching and learning of vocabulary is a feasible proposition (p. 356)*

Again, as mentioned in the theoretical part, L2 vocabulary learning can improve faster than L1 vocabulary learning usually does; if not L2 learners would never reach the totally or close-to-totally native speaker levels. However, it is possibly that 1000 words is not a usual product of second language learning (Wagner, Muse, & Tannenbaum, 2007); this rate is far from what the majority of learners of English as another language are pragmatically able to accomplish.

Conclusion

The major findings of this experiment are as follows: first, the great majority of the pre-diploma students have a written receptive vocabulary size of below 2000 word families. This means that most of them do not know the most frequent English words that are necessary to understand simplified spoken discourse and to use English in communication. Staehr (2008) explains that the threshold of 2000 headwords (base words) is an essential learning objective for low level EFL students.

As for reading comprehension, students having a vocabulary size averaging 2000 words provide less than 90% of text coverage, which is not enough to carry out adequate reading comprehension. Laufer (1997), and others mentioned previously, demonstrate that a learner requires a vocabulary size of about 3000 words for successful text comprehension (Kerten, 2010). So, the vocabulary size required to understand spoken English is lower than that required for reading comprehension. Secondly, for the students who oversized the 2000 words, they have a better understanding of spoken English but still have poor reading comprehension skills. Hence, the students failed to attain the threshold that allows successful reading.

And despite the fact that the students are able to approach the natives' vocabulary knowledge as several studies confirmed, yet they seem to have a quite small vocabulary compared to the latter.

The findings of the post-test do not support the research hypothesis; they point to one clear conclusion: technical terms inference method is not useful for students to enhance their general written receptive vocabulary knowledge; the Experimental Group didn't improve in comparison to the Control Group.

However, the study findings need to be interpreted cautiously because of the following:

Limitations of the Study

There are some limitations in this study which are:

-The sample size of the actual study is relatively small (40) from the entire population of third year EFL students at the university of Frères Mentouri/ Constantine 1.

-Time devoted to Cloze Procedure Activities is limited since not all the lectures in Psychology of Education involve technical terms of the field, especially students have only 1,5 an hour session per week to study this module, besides that it is not possible to ask other teachers teaching modules in specialized language to, each time, allow me half an hour (or more) of their lectures as they have programmes to finish in due year time. Besides that, it is difficult to manage to prepare cloze procedure activities related to the topics (or some of the topics) of their modules as there is no guarantee that they finish every lesson within less than the time limits of the lecture (as the activities should have been administered right after the lesson because of memory limits).

- Test design of vocabulary test is Multiple Choice test. So, participants, may be, have randomly guessed the answers; what would result in unreliable results.

- Finally, the current study concentrates on the receptive vocabulary size (breadth), i.e. vocabulary knowledge required for reading. No claim could be made with regard to productive vocabulary size. In fact it is not possible to assign such test as the tests used are time-consuming (VST and CPF activities).

In the light of the findings of the experiment, some suggestions and recommendations for further research follow:

Suggestions and Recommendations

Using Dictionaries*: Dictionaries can aid students with understanding and writing as well as with vocabulary learning. They seem helpful mainly for students having poor inferential capacities. Luppescu and Day (1993) found that learners who used a dictionary got higher scores on vocabulary test assigned directly after the reading, than learners who did not use a dictionary. Yet, some words, with several senses, in the vocabulary test are answered wrongly by more students who used a dictionary than those who did not. This finding proposes that learners are not so experienced in relation to dictionary searches (Luppescu & Day, 1993; cited in Nation, 2001).

Learners should be taught *how to use dictionaries*. For receptive use, the meaning of words should be linked to the context where it occurs (Nation, 2003; cited in Mokhtar et al. 2010), mainly for words with multiple meanings. It involves (1) determining the part of speech of the word to be searched for, (2) determining if it is an inflected or derived form that can be restricted to a base form, (3) inferring the general sense of the word and (4) determining if the word is required to be searched for by estimating its relation to the activity. In addition, *learners should find the dictionary entry.* Capacities required for this involve: (1) learning the alphabetical order (2) learning the dictionary characters and the different parts of speech and (3) learning other sites to look up the word, like derived forms, different spellings
(Nation, 2001).

***Word-part information:**Studies by Thorndike (1941), Bauer and Nation (1993), the studies, of affixes, of Stauffer (1942), Bock (1948), Hardwood and Wright (1954), and Becker, Dixon and Anderson -Inman (1980), all reveal that there is a somehow few functional available affixes that learners should learn at proper levels of their language learning progress (Nation, 2001).

To use word parts, learners are required to learn many things. For receptive use, they should be capable of identifying that a word like *unhappiness* is constituted of parts that can

appear in other words like unpleasant, happily, and sadness; what is named “relational knowledge” by Tyler and Nagy (1989). They should also know the significance of the parts, and how the significances link to form a novel yet connected sense. Hence, using word parts to aid retain novel words is a main vocabulary learning strategy. It merits time and frequent attention as it can include a considerable amount of English vocabulary (Nation, 2001).

***Using Computer-technology Words:** Jewell (2006) considered that technology is used as an aid in autonomous learning when he said *“allows for increased learner autonomy and control, providing a student-centered peadagogy” (p. 178)*. Pegrum (2009) suggested: *“teachers should stop seeing them as technologies and start seeing them as tools which suit some purposes” (p. 23).*

Words in the previously mentioned sizes cannot be learned through explicit teaching alone. And because the novel words that can be incidentally (unintentionally) acquired by EFL learners is restricted (Schmitt, 2010; cited in Loucky & Ware, 2017), scholars (e.g. Pellicer- Sanchez & Schmitt, 2010, Teng & He, 2015; cited in Loucky & Ware, 2017) have encouraged an approach involving both explicit and incidental vocabulary learning. Yet, Teng (2015) thinks the latter provides insignificant word knowledge. Hence, scholars and teachers have put more effort in using technology for teaching and learning outside the classroom, because certain essential low-frequency words appear seldom in authentic L2 texts, hence, there would be insufficient repetition to acquire their word knowledge from context. Moreover, there might be no contextual clues for unknown words, besides that certain authentic texts involve so many unfamiliar words.

Incidental acquisition of unfamiliar words is just possible if the learners understand. For deep understanding, large text coverage and background knowledge of the majority of the other Words in the context are required. So, the restricted time available for this learning effort requires a methodical plan for vocabulary learning. This can be reached via technology. So, a lot of teachers have been interested in the implication of computer-based technology in teaching English (Loucky & Ware, 2017).

Computer-assisted Language Learning (CALL) has been identified as the investigation for examination of applications of the computer in language teaching (Beatty, 2013; cited in Loucky & Ware, 2017) in order to aid learners learn a language. It involves lexical learning, word recognition, speaking, writing, and reading performance. Hence, so many tools -computers, mobiles, and personal digital assistants- have been largely used in language learning (Loucky & Ware, 2017).

*****Using textbook where learning new specialized words is part of learning about new field and and language.

In addition to that, to find out what students should be performing to enhance their vocabulary size, we are required to link the vocabulary size rating to the three major frequency levels of higher frequency, mid-frequency, and low-frequency words (Nation, 2010).

General Conclusion

Lexical inference is an important lexical strategy as it is connected to second/ foreign language vocabulary learning, and consequently reading comprehension and academic progress. In terms of pedagogy, this study has added support for the effectiveness of lexical inference strategy in learning technical words. Thus, students would better develop their vocabulary knowledge of specialized terms in context besides simple memorizations.

In the process of inferring technical terms through the CPF tasks, the students use their background knowledge related to their knowledge of the word, contextual support (clarification, example), besides their syntactic knowledge (semantic definitions). Moreover, they rely more on the top-down process in dealing with technical terms, especially the meaning of these latter is generally not guessable from the individual words (they are characterised by semantic specification). The think-aloud protocol, that was supposed to help uncovering the latter processes, was eliminated shortly after the learners were assigned the first cloze procedure format activity; the majority of the participants said it was difficult and disturbing to them to explain their thinking while answering the exercise in hand and in a limited time. Hence, more researches on easy/ practical ways of getting information about learners' inferring (thinking) procedures are required.

In addition, the findings reveal that third year students have a limited/ poor receptive vocabulary knowledge (an average of below 2000 words), since they do not have the minimum vocabulary size goal (around 3000 words) that permit them to read successfully at their level. The situation is quite alarming as the learners have been formally exposed to the English language for a minimum of 6 years before they attended the university level.

Overall, having a limited vocabulary size, the students may struggle to achieve comprehension. This will result in other difficulties like a feeling of disappointment from not getting the meaning of what is read and hence they may read less. Stanovich (1986) depicted this mutuality as "the Matthew effect" which proposes the rich get richer mechanism. Good readers (comprehenders) read more while poor readers will avoid reading, hence, the former can get better as readers and learn more from reading while the latter get worst and have less chance to learn new words and understand scripted texts (Caldwell, 2008).

Concerning the t-test results, they do not confirm the hypothesis of the study. They show that learning the two variables in the study, technical terms inference and EFL non-technical written receptive vocabulary knowledge, are independent. In other words, technical words inferring do not assist constructing new semantic representations of EFL (non-technical) written receptive words. Therefore, although words are connected and do not appear alone in our minds, they might be unrelated to each other. However, the fact that there has been an increase, though restricted, in the post-test grades of the experimental group's knowledge of the receptive words (1835 word families against 1765 for the control group), one suggests to conduct a long-term experiment to find out more about the effectiveness of the treatment used. In addition, more exploration of this area, technical terms in mind, which lies at the intersection of language and subject learning is required to discover how subject- knowledge terms might cognitively connect to other general words, and to examine more deeply how new connections to existing words are made (how repertoires are updated), because one thing is sure: little is known about the mental lexicon.

Finally, L2 students may be able to approach the vocabulary size known by natives, yet that knowledge, according to researches like that of Adolphs and Schmitt (2003) and Nation (2006), may be too huge mainly for foreign language students (EFL learners), i.e., on the contrary to ESL environment, English is not a predominant language for EFL students. Again, it might be possible that the teaching practices that these students have are not enough. If it is the case, increasing learners' receptive knowledge of new lexical items is possible out of their classroom work (without taking out time of their classroom work). Hence, the study proposes to get further examining L2 vocabulary size and the process of EFL lexical inference via scrutinizing the type of knowledge sources needed for successful inference of word meaning, for example. Also, the relationship between them to help students become more aware of the VLS (vocabulary learning strategies) profiles. This can even be done through learning inference and reading in a separate learning module. Students should be encouraged as much as possible to read (varying between easy texts below their level and little challenging ones). Studies propose that extensive reading, free reading, and reading for pleasure support incidental (unintentional) vocabulary learning. Gass and Selinker (1999) consider that learners may incidentally get knowledge of meaning (through reading). Gee (2007) thinks that too much reading is the only way to guarantee vocabulary learning success. So, students should be encouraged to guess the meaning of unfamiliar words in different texts. The good news is that inferring, as stressed in the theoretical part, is a trainable strategy. Therefore, the learners should be instructed, trained, and assisted through practice, on how to effectively use contextual clues to make successful guessing while reading until they become independent with the strategy.

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APPENDICES

Cloze Procedure Format Activities Appendices

Exercise01: **In the following passage, some words have been crossed out. First, read the passage and then fill in each blank with the word you find mostly appropriate:**

long-term memory - rehearsal - sensory memory - neurons - five senses - stimuli (information received through senses) - encoding - limited capacity - attention - storageunlimited - short-term memory - retrieval.

N. B.an item may appear twice and some items are irrelevant

..………………..is the shortest-term element of memory. It is the ability to retain

(1)**Sensory memory**

impressions of sensory information after the original stimuli have ended. It acts as a kind of buffer [temporary holder of information] for stimuli received through the…………..[...].

(2) **five senses**

The**....……………….**detected by our senses can be either deliberately ignored, in which

(3)**stimuli**

case they disappear almost instantaneously, or perceived, in which case they enter our sensory memory […].

………………………decays or degrades very quickly [...].

(4) **Sensory memory**

Information is passed from the sensory memory into**…………………….** via the process

(5)**short-term memory**

of**……………………..[**…] which effectively filters the**………………**to only those which

(6)**attention** (7)**stimuli**

are of interest […].

The transfer of information to……………………… for more permanent storage can be

(8) **<u>long-term memory</u>**

facilitated or improved by mental repetition of the information [...].

Short-term memory has a…………………, which can be readily illustrated by the simple

(9) **<u>limited capacity</u>**

expedient [means] of trying to remember a list of random items (without allowing repetition or reinforcement) […].

It is usually assumed that short-term memory spontaneously decays over time […], however, it can be extended by……………………[…].

(10) **<u>rehearsal</u>**

……………………….can store a seemingly………………… amount of information

(11) **<u>Long-term memory</u>** (12) **<u>unlimited</u>**

almost indefinitely.

……………………….can become long-term memory through the process of consolidation

(13) **<u>Short-term memory</u>**

[strengthening; sleeping for example is thought to be important to this process], involving rehearsal and meaningful association.

"**The Human Memory**"
Luke Martin, 2010

Exercise 02: **Read the text and fill in the blanks with the appropriate following terminology:** unconditioned response - conditioned stimulus - conditioned response - neutral stimulus - unconditioned stimulus

N. B. each might appear twice in the text.

A boy enjoys listening to his father talk about the boy's baseball talent and potential [capacities] to play professional baseball …………………....Later, the boy's

(1) **neutral stimulus**

father begins to drink alcohol excessively while he lectures his son for extended periods about things the boy is not doing properly to become a great athlete. These aversively[1] perceived lectures include many ……............................ (e.g., bad breath, screaming,

(2) **unconditioned stimuli**

shaking) that bring about the ………………………….. of anger in the child. Alternating

(3) **unconditoned response**

throughout these aversive lectures are compliments from the father about the boy's baseball talents and potential …………………..**..** After a few of the aforementioned

(4) **neutral stimulus**

[above-mentioned] lectures, whenever the father, whether sober or intoxicated [clear-headed or drunk], compliments the boy on his talents, the boy evidences [shows] the …………………………of anger. Thus, the first ………………… (discussing the boy's

(5) **unconditioned response** (6) **neutral stimulus**

baseball talents and potential) becomes a ……………………….. because it elicits

[1]aversion: an aversion (to sb/ sth) a feeling of great dislike (Oxford, 1999, p. 45)

(7) **conditioned stimulus**

[evokes],by itself, the …………………….... of anger (Donohue, Romero, and Devore,

(8) **conditioned response**

2006).

Chapter 4 "**cognitive and behavioral contribution**"
Comprehensive Handbook of Personality and Psychopathology
Robert Ammerman
2006

Exercise 03:**Read the text and fill in the blanks with the appropriate following terminology:**scheme (s) - accommodation - adaptation - assimilation.

N. B.each might appear twice in the text.

Young children demonstrate patterns of behavior or thinking, called................**[**…].

(1) **schemes**

According to Piaget, ... is the process of adjusting schemes in response to

(2) **adaptation**

the environment by means of assimilation and accommodation. **..............................**is the

(3) **Assimilation**

process of understanding a new object or event in terms of an existing....................... If

(4) **scheme**

you give small enfants small objects that they have never seen before but that resemble familiar objects, they are likely to grasp them, bite them, and bang them.

Sometimes, when old ways of dealing with the world simply don't work, a child might modify an existing...................in light of new information or new experience, a

(5)**scheme**

process called**.............................**. For example, […] because of the unexpected

(6) **accomodation**

consequences of banging the egg, the baby might change the scheme.

The baby who banged the egg […] had to deal with situations that could not be fully handled by existing schemes. This […] creates a state of disequilibrium [...] People naturally try to reduce such imbalances by [...] developing new..........................or adapting

(7) **schemes**

old ones until equilibrium is restored. This process of restoring balance is called equilibration.

Educational Psychology- Theory & Practice
Robert Slavin
2009

Exercise 04:**Read the text and fill in the blanks with the appropriate following terminology:** reflexes - schemes - sensorimotor - object permanence.

N. B. each might appear twice in the text.

Piaget divided the cognitive development of children and adolescents into four stages […]. The earliest stage is called **...........................**because during this stage babies

(1) sensorimotor

and young children explore their world by using their senses and their motor skills.

[…] Initially, all infants have inborn behaviors called................. **[**…] place your

(2)**reflexes**

finger in the palm of an infant's hand, and the infant will grasp it. These and other behaviors are innate and are the building blocks from which the infant's first........................... form.

(3) **schemes**

Another hallmark of the...........................period is the development of a grasp of

(4) **sensorimotor**

.... […]. By 2 years old, children understand that objects exist even if

(5) **object permanence**

they cannot be seen.When children develop this notion of object permanence, they have taken a step toward more advanced thinking (Cohen and Cashon, 2003).

Educational Psychology- Theory & Practice
Robert Slavin
2009

<u>Exercise 05:</u> **Read the text and fill in the blanks with the appropriate following terminology:** centration - egocentric - preoperational - conservation – reversibility.
N. B. each might appear twice in the text.

Preschoolers have greater ability to think about things and can use symbols to mentally represent objects. During the..............................stage, children's language and

(1) **<u>preoperational</u>**

concepts develop at an incredible rate. Yet, much of their thinking remains surprisingly primitive. One of Piaget's earliest and most important discoveries was that young children lacked an understanding of the principle of **..............................**For example, if you pour

(2) **<u>conservation</u>**

milk from a tall, narrow container into a shallow, wide one in the presence of a .... child, the child will firmly believe that the tall glass has more milk.

(3) **<u>preoperational</u>**

Several aspects of preoperational thinking help to explain the error on conservation tasks. One characteristic is ....: paying attention to only one aspect of a

(4) **<u>centration</u>**

situation. Children might have claimed that there was less milk after pouring because they centered on the height of the milk, ignoring its width.

Preschoolers' thinking can also be characterized as being irreversible**.** .... is a very important aspect of thinking, according to Piaget; it simply

(5)**<u>reversibility</u>**

means the ability to change direction in one's thinking so that one can return to the starting point. As an adult, for example, we know that if 7 + 5 = 12, then 12 – 5 = 7…If preoperational children could think this way, then they could mentally reverse the process of pouring the milk and realize that if the milk were poured back into the tall beaker, its quantity would not change.

Finally, ...children are .... in their thinking. Children at

(6)**preoperational** (7)**egocentric**

this stage believe that everyone sees the world exactly as they do. For example, Piaget and Inhelder (1956) seated children on one side of a display of three mountains and asked them to describe how the scene looked to a doll seated on the other side. Children below the age of 6 or 7 described the doll’s view as being identical to their own, even though it was apparent to adults that this could not be so.

Educational Psychology- Theory & Practice
Robert Slavin
2009

<u>Exercise 06:</u> **Read the text and fill in the blanks with the appropriate following terminology:** transitivity - seriation - abstract - concrete – hypothetical – formal operations.

N. B. each might appear twice in the text.

Can you remember an occasion when your gym teacher said, "line up by height from tallest to shortest"? Carrying out such a request is really quiet easy for concrete [operational children] who are now capable of........................– theability to mentally

(1) **<u>seriation</u>**

arrange items along a quantifiable dimension such as height and weight.

Closely related to seriation is the concept of ....– the ability to

(2) **<u>transitivity</u>**

accurately infer the relations among elements in a serial order. If, for example, Jane is taller than Susan, who is taller than Jo, then Jane has to be taller than Jo. Elementary as this inference may seem to us, Piaget claimed that children show little awareness of the logical necessity of the ....principle before the stage of concreteoperations (Markovits

(3) **<u>transitivity</u>**.

& Dumas, 1999).

Social and Personality Development
David R. Shaffer
2009

Piaget names this period ....operation because his research implied that 7-to-

(4) **<u>concrete</u>**

11year-olds are not yet able to apply their operational schemes to think *logically* about .... ideas or about any .... proposition that violates their conceptions of

(5) **<u>abstract</u>** (6) **<u>hypothetical</u>**

reality.

Piaget used the term .... to describe this new ability. Formal

(7) "**formal operations"**

operations refer to the ability to perform mental operations with ...., intangible

(8) **abstract**

such as "justice" or "poverty" and to be able to estimate or describe the effect of these concepts intangible concepts. Therefore, youth can now represent in their mind circumstances, or events that they have never seen, nor personally experienced.

Child Development Theory *(*www.mentalhelp.net)
Angela Oswalt
2010

Exercise 07: **Read the text and fill in the blanks with the appropriate following terminology:** aesthetic - deficiency needs - physiological - growth needs - self-actualization.

N. B. each might appear twice in the text.

Psychologist Abraham Maslow (1968) identified seven categories of basic needs common to all people. Maslow represented these needs as a hierarchy in the shape of a pyramid. A [hierarchy] is an arrangement that ranks people or concept from lowest to highest. According to Maslow, individuals must meet the needs at the lower levels of the pyramid before they can successfully be motivated to tackle the next level.

[…] the psychological needs are the foundations of the pyramid. Maslow suggested that the first and most basic need people have is the need for survival: their.........................

(1)**physiological**

requirement for food, water, and shelter.

After their **........................** needs have been satisfied, people can work to meet their

(2) **physiological**

needs for safety and security…Safety is the feeling people get when they know no harm will befall them, physically, mentally, intellectually, or emotionally; security is the feeling people get when their fears and anxieties are low.

On the third level of the pyramid are needs associated with love and belonging. These needs are met through satisfactory relationships…Satisfactory relationships imply acceptance by others.

Once individuals have…met their need for love…, they can begin to develop positive feelings of self-esteem.

If a student cannot meet one or more of these needs, that student is unlikely to be motivated to pursue any of the needs in the succeeding levels. Because of this, the first four levels of needs are called ....

(3) **deficiency needs**

The fifth level of Maslow's pyramid represents an individual's need to know and understand…[this need] is a primary area of focus for education.

......................needs refer to the quality of being creatively, beautifully, or

(4)**Aesthetic**

artistically pleasing;…are the needs to express oneself in pleasing ways.

At the top of the pyramid is the need for **..............................**, which is a person's

(5)**self-actualization**

desire to become everything he or she is capable of becoming- to realize and use his or her full potential, capacities, and talents.**...............................**is Maslow's term for

(6)**Self-actualization**

self- fulfilment (Kelly, 2009). It is rarely met completely; Maslow (1968) estimated that less than one percent of adults achieve total **................................**.

(7) **self-actualization**

The upper three levels of the pyramid constitute a person's ....

(8) **growth needs**

[They] can never be satisfied completely .

BUILDING TEACHER
David Martin et al.
2012

Vocabulary Size Test[1]

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

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

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

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

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

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

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

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

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

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

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

Second 1000

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

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

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

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

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

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

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

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

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

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

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

Third 1000

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

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

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

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

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

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

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

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

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

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

Fourth 1000

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

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

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

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

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

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

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

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

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

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

Fifth 1000

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

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

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

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

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

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

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

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

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

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

Sixth 1000

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

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

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

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

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

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

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

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

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

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

Seventh 1000

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

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

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

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

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

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

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

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

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

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

Eighth 1000

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

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

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

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

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

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

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

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

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

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

Ninth 1000

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

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

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

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

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

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

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

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

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

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

Tenth 1000

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

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

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

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

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

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

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

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

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

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

Eleventh 1000

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

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

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

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

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

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

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

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

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

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

Twelfth 1000

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

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

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

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

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

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

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

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

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

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

Thirteenth 1000

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

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

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

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

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

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

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

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

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

10. DIDACTIC: The story is very **didactic**.
    a. tries hard to teach something
    b. is very difficult to believe
    c. deals with exciting actions
    d. is written in a way which makes the reader unsure of the meaning

Fourteenth 1000

1. CANONICAL: These are **canonical** examples.
   a. examples which break the usual rules
   b. examples taken from a religious book
   c. regular and widely accepted examples
   d. examples discovered very recently

2. ATOP: He was **atop** the hill.
   a. at the bottom of
   b. at the top of
   c. on this side of
   d. on the far side of

3. MARSUPIAL: It is a **marsupial**.
   a. an animal with hard feet
   b. a plant that grows for several years
   c. a plant with flowers that turn to face the sun
   d. an animal with a pocket for babies

4. AUGUR: It **augured** well.
   a. promised good things for the future
   b. agreed well with what was expected
   c. had a colour that looked good with something else
   d. rang with a clear, beautiful sound

5. BAWDY: It was very **bawdy**.
   a. unpredictable
   b. enjoyable
   c. rushed
   d. rude

6. GAUCHE: He was **gauche**.
   a. talkative
   b. flexible
   c. awkward
   d. determined

7. THESAURUS: She used a **thesaurus**.
   a. a kind of dictionary
   b. a chemical compound
   c. a special way of speaking
   d. an injection just under the skin

8. ERYTHROCYTE: It is an **erythrocyte**.
   a. a medicine to reduce pain
   b. a red part of the blood
   c. a reddish white metal
   d. a member of the whale family

9. CORDILLERA: They were stopped by the **cordillera**.
   a. a special law
   b. an armed ship
   c. a line of mountains
   d. the eldest son of the king

10. LIMPID: He looked into her **limpid** eyes.
    a. clear
    b. tearful
    c. deep brown
    d. beautiful

Résumé

L’inférence lexicale, ou induire la signification des mots, est liée aux compétences cognitives du raisonnement verbale utilisé dans la compréhension des textes écrits. A cet égard, cette étude a pour but d’examiner l’effet de l’inférence des mots techniques en Anglais, comme langue étrangère, dans le développement du lexique réceptif général. En plus, l’étude s’intéresse aux processus linguistiques impliqués dans l’inférence de terminologie. Pour ce faire, on a mené une expérience durant l’année académique 2013-2014 ou deux groupes d’étudiantes en troisième année Licence ont été investiguées: le premier groupe sert comme groupe témoin tandis que le deuxième groupe représente le groupe expérimental. Les groupes ont été testés pour le volume du vocabulaire anglais (la variable dépendante) en utilisant la version 14 000 du VST (Vocabulary Size Test). De plus, la capacité de l’inférence (la variable indépendante) a été mesurée à travers l’emploi du ‘closure test’ dont les activités ont été distribuées avec une dose hebdomadaire, à la fin des cours en Psychologie de l’Education. A chaque séance, les étudiantes ont du remplir les textes attribués dans ce dernier domaine, avec des mots techniques donnés appris dans la même séance. Les données sont analysées à travers le t-test. Le résultat démontre d’une part que les scores de l’inférence ne correspondent pas aux scores obtenus lors des activités du test de closure, et d’autre part, l’inférence lexicale apparait être liée à l’apprentissage du vocabulaire technique; les connaissances sémantiques et les connaissances préalables étaient les sources de connaissance les plus utilisées dans l’inférence des mots manquants. En plus, le volume du vocabulaire réceptif des étudiantes s’avère insuffisant pour effectuer une compréhension adéquate. La présente étude suggère encore plus de recherche sur les sources du savoir inclus dans une inférence fructueuse. Aussi, enseigner le vocabulaire doit être renforcé, davantage de manière à encourager la lecture,et conséquemment l’inférence,en utilisant les dictionnaires ainsi que la technologie.

ملخص

يرتبط الإستدلال اللّغوي، أو تخمين معاني الكلمات المبهمة، بقدرات التّفكير اللّغويَة الّتي تساهم في تحليل النّصوص المكتوبة لاستخراج معاني المفردات المجهولة . في هدا الصَدد، تبحث هده الدَراسة في دور الإستدلال المتعلّق بالمصطلحات التّقنيَة الإنجليزيَة (كلغة أجنبيَة) في تطوير حجم المفردات المكتوبة المكتسبة. بالإضافة إلى دلك، تهتمّ الدَراسة بالعمليَات العقليَة المستعملة في الإستدلال المرتبط بالمفردات الخاصَة. لهدا الغرض، استخدمنا المنهج التَجريبي (تجربة)، خلال العام الدَراسي 2013-2014، تضمَ مجموعتين من طالبات السَنة الثّالثة ليسانس بقسم الإنجليزيَة: تمُثّل المجموعة الأولى من الطّالبات الفئة المرجعيَة بينما تعتبر المجموعة الثّانية فئة تجريبيَةَ. تمَ اختبار كلا الفئتين بالنَسبة لحجم المفردات (المتغيَر التّابع) و دلك باستخدام النّسخة 000 14 من اختبار ال VST (Vocabulary Size Test) .

بالإضافة إلى دلك، تمَ تقييم المهارات اللّغويَة الإستدلاليَة للطّلبة (المتغيَر المستقلَ) عن طريق اختبار تمارين ال CPF (Cloze Procedure Format) ، ودلك تقريبا كلَ أسبوع من العام الدَراسي، في نهاية حصص مادَة علم التَربية النَفسيَة. في كلَ حصَة، يملأ الطّلبة الفراغات في النُصَ المقدَم باستعمال المفردات التّقنيَة المقترحة والمدرَسة في نفس الحصَة. تمَ تحليل المعطيات، بعد دلك، باستخدام اختبارال t-test . بيَنت النَتائج بأنَ حجم المفردات (الإنجليزيَة) المكتوبة المكتسبة لا تتلاءم مع النَتائج المتحصَل عليها من تمارين ال CPF ،بينما أثبت الإستدلال اللُغوي ارتبا طه بتعلُم المصطلحات التَقنيَة؛ حيث المعرفة اللّفظيَة و الخلفيَة المعرفيَة هي أكثر المصادر المعلوماتيَة المستخدمة لتخمين معاني الكلمات المفقودة في النّصوص. أيضا، بيَنت الدَراسة بأنَ كمَية المفردات المكتسبة لدى الطّلبة لا تؤهّلهم للفهم الكافي للنُصوص. لدلك، نحتاج إلى المزيد من التَمحيص حول مصادر المعرفة المتعلّقة بالإستدلال النَاجح. أيضا، يجب تعزيز تعليم المفردات في الأقسام عن طريق تشجيع القراءة المكثّفة و الإستدلال اللُغوي، واستخدام المعاجم و التَطبيقات (التّكنولوجيا) الّتي يمكن استعمالها خارج الأقسام، و دلك لتنمية و تخزين أفضل للمفردات في الدَاكرة.