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Investigating The Growth Of Vocabulary Size And Depth Of Word Knowledge In Iraqi Foreign Language Learners Of English

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INVESTIGATING THE GROWTH OF VOCABULARY SIZE AND DEPTH OF WORD KNOWLEDGE IN IRAQI FOREIGN LANGUAGE LEARNERS OF ENGLISH

A Masters Thesis

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In Partial Fulfillment

Of the Requirements for the Degree

Master of Arts, English

By

Akram Basim Mohsin Alfatle

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ABSTRACT

This study examined the growth of vocabulary size and depth of word knowledge in Iraqi foreign language learners of English (EFLs) over four years of university instruction. The secondary objective was to investigate the influence of language learning and practice variables on the lexical growth of Iraqi EFLs. Tools two published vocabulary tests of English vocabulary size and word associations. A self-report questionnaire was used to collect demographic information and language learning variables from participants. (n = 120) following a cross-sectional method, 30 students from each of the four years of study, were randomly selected to participate. A test administrator from an Iraqi university conducted the recruitment and the testing process. Self-report measures were analyzed for validity and reliability; based on these results the data from 25 participants were excluded from further analysis. Multivariate analyses (n = 95) indicated significant vocabulary growth by a large effect across every year of study with students averaging a gain of 800-1,000 word annually and vocabulary growth accelerating moderately over the course of study. The findings have implications for curriculum development and materials selection for this population.

KEYWORDS: vocabulary size, word knowledge, vocabulary acquisition, lexical growth, L2 lexicon, foreign language teaching, EFL, TESOL.

This abstract is approved as to form and content

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INTRODUCTION

General Background of the Study

For most foreign language learners, the ultimate goal of language learning is to be able to use the language fluently and communicate effectively. In order to achieve this, the two main components of the language to acquire are the grammar or structure of the language and its vocabulary. In order to form an utterance, learners need to be able to string together a number of words whose meaning they know. Words are the basic units for constructing phrases, utterances, and extended discourse. Whether learners are learning a first, second, or a foreign language, developing vocabulary is central to that purpose; without lexical knowledge speakers could not convey meaning, they could not communicate their thoughts. Lexical knowledge of language entails the number of words learners know and the depth of knowledge they have of each of those words. Researching lexical knowledge is fundamental to understanding the nature of second language acquisition and foreign language learning and, as researchers have pointed out (Hunt & Beglar, 2005; Goulden et al., 1990; Zareva et al, 2005), more studies are needed in this area, particularly to understand the size and depth of the lexicon, the productive strategies that contribute to word learning, and the assessment of vocabulary knowledge.

Key measures of foreign language learning are vocabulary size and word knowledge quality. Measuring the growth of vocabulary size and word knowledge quality over time provides an important index for assessing foreign language proficiency (Schmitt & Meara, 1997; Qian & Schedl, 2004; Read, 2004; Horst & Collins, 2006; Pearson et al., 2007; Kaivanpanah & Zandi, 2009; Rashidi & Khosravi, 2010; Hellman,

2008; Hellman, 2011). These studies have revealed important aspects about the assessment of lexical knowledge and provided motivating implications for more research in this area. Additionally, research in the field of vocabulary acquisition has aimed at discovering strategies and techniques for assessing and teaching vocabulary. The focus on this research area has intensified because experts have noticed that vocabulary learning poses one of the major challenges that learners encounter when learning another language. Researchers recognize that more information is still necessary to improve recommendations on how to help learners overcome the challenge of building a large vocabulary with deep word knowledge, to employ strategies that aid productive word learning, and to assess progress towards these goals. Read (2000) has argued that the goal of assessing vocabulary is not only to evaluate the achievement of individual learners but also to provide a better understanding of the process of vocabulary acquisition. Therefore, research on vocabulary assessment has become a rapidly expanding and much needed field in foreign language research.

Statement of the Problem

The reason for undertaking this research in vocabulary assessment is that little is known about the lexical development of students who are preparing to become English as a foreign language teachers in Iraq. Two recent studies (Yasin & Jawad, 2015; Darabkh & Sabah, 2014) investigated the role of morphological knowledge in vocabulary knowledge and the relation between the dictionary skills and word knowledge of Iraqi EFL students. However, the participants of these research projects were small groups of students who lived and studied outside the country; therefore, the findings did not inform

us about the vocabulary development of those Iraqi students who study at Iraqi universities without the benefit of being immersed in the target language within a native speaker environment. The aim of the present study was to investigate the growth of English vocabulary size and depth of word knowledge in Iraqi university students across the four years of study using the tools of Hellman (2008), which were two vocabulary tests.

When studying to become English language teachers, Iraqi students have limited contact with the target language, and most of their English acquisition is limited to the classroom and their homework assignments. Although they may opt to supplement their formal instruction with pleasure reading, movie watching, and social media, students vary as to the extent that they pursue these informal opportunities to develop their English language proficiency. Using the instruments of Hellman's (2008) study, I gained better insight about how Iraqi pre-service teachers develop their English vocabulary over time, what the growth curve is, and which student variables relate significantly to the growth of vocabulary knowledge.

Iraqi EFL teacher candidates are all admitted to the university with at least a basic proficiency in English, developed in English as a foreign language classes taken from the first grade through high school, with instructional hours gradually increasing every year. Iraqi universities admit into the English major only those applicants who achieved a high A in the subject in the senior year of high school. In addition, selective universities have additional admission criteria, such as an oral exam/interview and a subject test. Once admitted, teacher candidates take most of their courses within the same department and progress through a course of study in phonetics, grammar, conversation, reading

comprehension, and English literature. During the first two years, the same courses are repeated with progressively more difficult content. The main source of vocabulary learning is a reading comprehension course, which students take for four semesters. The syllabus of this course includes vocabulary learning goals.

As a learner and teacher of English in Iraq, my impression was that students varied dramatically in their vocabulary size and depth of word knowledge. While some students attain a relatively small vocabulary size and depth of word knowledge, others achieve a high levels of proficiency in both of those variables. Sometimes, even when learners manage to develop a considerable vocabulary size, weaknesses are apparent with using words correctly. For example, many learners use synonyms randomly or interchangeably without clear understanding of each word's specific meaning, connotation, or distribution, which leads to a wide range of semantic errors that interfere with meaning. Other common vocabulary problems are similar to what Laufer (1990) described as typical challenges in word learning in English, such as the similarity of form between different words (*embrace/embarrass*); morphological similarity (*respectable/respective*); abstractness; connotations; and other linguistic interfering linguistic factors. Then, assessing the lexical development of Iraqi learners of English may contribute to our general understanding of the lexical outcomes of typically developing foreign language learners of English who acquire their lexical knowledge during four years of university studies as English language majors.

Research Questions

The present study aimed to address the following research questions:

1. Is there a significant growth in the vocabulary size and depth of word knowledge in Iraqi EFL students over the four years of university instruction?

2. Is there a relationship between language practice variables and the two vocabulary achievement measures?

The Purpose of the Study

The main purpose of the study was to assess vocabulary size and depth of word knowledge of Iraqi foreign language learners of English using two vocabulary tests and a questionnaire. The primary objective was to determine if Iraqi pre-service teachers of English show a significant growth, over the course of their four-year undergraduate careers, in their vocabulary size and depth of word knowledge. The secondary objective was to investigate the connection between vocabulary proficiency and learner variables, which were collected with a questionnaire.

REVIEW OF THE LITERATURE

Introduction

A growing body of research on investigating vocabulary size and depth of word knowledge supports the notion that the lexicon has a dominant part in language learning. Researchers have developed a variety of tools to obtain qualitative and quantitative measures of language learners' lexical attainment (Laufer, 2001; Laufer et al., 2004; Read, 2004; Nation & Webb, 2011; Nation, 2008; Read, 1993). Since the main goal of the current research is to measure vocabulary size and depth of word knowledge in Iraqi EFL university students, this chapter will review the various notions that researchers associate with vocabulary size and word knowledge. Some of the tools that were previously used to measure the above two aspects are also examined.

Conceptual Framework of Word Knowledge

Researchers have explored a complex framework of word knowledge (Richards, 1976; Nation, 1990; Nation; 2001). Although a pervasive mistaken notion endures that the main tool for learning new words is the dictionary and word learning entails the memorization of long lists, this type of learning is most definitely not the main source of the acquisition of large number of vocabulary items a speaker needs to know in order to be able to communicate in a target language (Read, 2000). Word knowledge is in fact much deeper than memorizing isolated words. In order to communicate, a large number of words must be readily accessed and a great deal must be known about each word. The speaker must know how the word is pronounced, what forms it has, with what other

words it should co-occur; the speaker must know the constraints on the word's use and the linguistic patterns it fits into (Nation, 1990). Consequently, researchers pointed out that having a complete knowledge of words is rather a gradual process for learners of English that results from a significant exposure to the language over a long period of time.

To investigate the different dimensions associated with vocabulary knowledge, Henriksen (1999) suggested that more precise descriptions of the various dimensions of lexical competence are required to guide research in the area of vocabulary acquisition. She proposed a model of lexical competence that is based on three dimensions. The first dimension is the *partial to precise knowledge*, which is related to studies that use reading to measure vocabulary size or breadth, achievement tests, word-recognition tasks, or a combination of these tasks. According to this dimension, word knowledge starts with recognition then moves to incomplete understanding of the meaning and finally to a complete understanding of the word (Zhong, 2011). Examples of studies that used this dimension are, Hazenberg and Hulstijn, (1996), and Herman, Anderson and Nagy (1987). The second dimension is the *depth of word knowledge*, according to which a researcher tests learners' depth of word knowledge by probing the different relations among words like synonymy and antonymy, or using words' collocational restrictions. Read (1993) associated this dimension with the quality of word knowledge, that is, links between different words. This dimension was used in many studies (Erdmenger, 1985; Ghadessy, 1989). The third dimension is the *receptive-productive dimension*, which is related to the difference between comprehension and production of words. Receptive, sometimes called passive, knowledge is the ability to recognize a word within a context, while productive

or active knowledge is the ability to use a word in speech or writing (Nation, 2001). For example, Bahrick and Phelps (1987) used a combination of tasks (a translation task from L1 to L2 and selection of the correct translation from a list) to measure recognition and production of words (Henriksen, 1999, pp. 304-307).

As mentioned before, words do not occur as isolated items but rather within a complex network. Therefore, knowledge of different levels of lexical items is essential for language learners to use the target language effectively. However, knowing a word is not an easy process for language learners. The most frequently cited elaboration of what it means to know a word comes from Nation (2001). Nation conceptualized word knowledge as the ability to understand the form of a word while listening or reading, which means receptive knowledge, and the ability to appropriately use the written and spoken form, which means the productive knowledge. He extended the elements of word knowledge into three wider concepts: form, meaning, and use. Being able to know the *form* of a word includes knowing its parts, its sounds, and its spelling. Knowing the *meaning* of a word includes connecting its form and meaning appropriately, knowing the notions and referents of the word, and knowing the other words that can be associated with this word. Finally, the ability to know how to *use* a word includes knowing its grammatical functions, what words it can be collocated with, and its incorporated parts of speech (Nation, 2001, pp. 26-28).

In Nation's (2001) view, the process of vocabulary acquisition involves processing a network of information about each word's form, meaning, and use if language learners are to use a word appropriately, accurately, and meaningfully. Other researchers explored this notion of word knowledge through a somewhat similar

framework. For example, Celce-Murcia and Larsen-Freeman (1999) stated that to know a word to its full extent is to know the following: spelling, phonetic representation (i.e., pronunciation, syllabification, and stress), morphological irregularity, syntactic features and restrictions, common derivations and collocations, semantic features, pragmatic features, and restrictions of these latter features. In order to actually use words appropriately in their writing or speaking, English language learners must understand much more than merely the general meaning of the word. As a result, the amount of information they must master in terms of the lexicon is definitely immense (Celce-Murcia & Larsen-Freeman, pp. 30-31).

Further, researchers deem that acquiring the same quantity of knowledge for every word is not a straightforward process. It should be taken into account that the range of words that the native speakers of a language are able to understand is wider than the range of words they really use. Kojima and Yamashita (2014) declared that the most noticeable difference between second language (L2) learners and native speakers is the vocabulary they use. While native speakers speak and write with an extensive vocabulary, the L2 learner is limited by a relatively narrow range of vocabulary. However, as learners develop in their proficiency, their vocabulary range widens and their knowledge of individual words increases. Therefore, researchers stressed the importance of enhancing the productive knowledge of words. For example, Shejbalova (2006) explained that the ability to recall words and identify them in their spoken and written forms should be the principal aim of language learners.

Moreover, Iso and Aizawa (2008) noted the wide acceptability of the notion that vocabulary knowledge is probably the most fundamental and important asset to a

student's success in verbal communication tasks. Of the many tests that have been devised to measure outcomes of vocabulary learning, vocabulary size tests have attained the most attention among researchers and teachers. Examples of these include the Vocabulary Levels Test (Nation, 1990), the Yes/No Test (Meara, 1992), and the Eurocentres Vocabulary Size Test (Meara & Jones, 1990) (Iso & Aizawa, 2008, p. 13). Iso and Aizawa (2008) noted that considering the popularity of vocabulary size tests, there is a paucity of studies investigating the limitations of these tests. Although test scores by which vocabulary sizes have been estimated have been shown to vary according to type of test, it has yet to be shown which factors of a vocabulary size test actually affect results. Iso & Aizawa's research identified one factor to be the *sequence of questions*. The rationale has to do with the time it takes to complete an entire vocabulary size test. As the time increases, the test taker becomes increasingly susceptible to fatigue towards the latter part of the test. *Confidence* is another factor. Practitioners and researchers agreed that learners do not always answer questions with the same level of confidence when taking these tests, particularly multiple-choice tests. It is still not known how confidence can be incorporated conceptually while designing vocabulary size tests. Iso and Aizawa (2008) emphasized that confidence was related to learners' vocabulary size; learners who had a significantly larger vocabulary were also more confident in their responses on the *Vocabulary Levels Test*.

A general assumption in the measurement of vocabulary size is that the frequency of a word is strongly connected to the word's difficulty. Aizawa (2006a) asserted that vocabulary size decreased regularly as the frequency of the words tested became lower until the 4,000 frequency level (Nation, 1986). Below this level no tangible relationship

exists between word frequency and the size of a learner's vocabulary. A number of studies attempted to make clear this relationship between the frequency levels of vocabulary and learners' vocabulary knowledge (Mochizuki, 2007; Mochizuki, 1998; Aizawa & Iso, 2004). However, none had taken into consideration what Aizawa (2006a) saw as an obvious yet neglected factor: the sequence of test items, and to a lesser extent, the confidence factor.

While it is generally accepted that mastering a high percentage of vocabulary is a crucial part in language learning, it is also acknowledged that acquiring vocabulary items is a gradual process that requires an enormous effort by learners. Folse (2006) pointed out that English vocabulary acquisition is considered by students the most challenging problem in English language learning and that language learners desired explicit instruction. He asserted that learners need a minimum of 2,000 words to converse in English and 3,000 words families for beginning to be able to read authentic texts. He further stated that as large as a 10,000 word vocabulary may be minimally necessary to understand advanced academic texts. Therefore, developing curricula and materials for vocabulary teaching is vital to support L2 learning.

Along the same lines, Meara (1996) referred to what he considers to be "one of the most influential papers in the *canon* of writing on vocabulary acquisition" written by Jack Richards in 1976 (p. 1). The main contribution of Richard's work was to explicate how the notions of linguistic theory should inform classroom practice. Many researchers, including Meara, do utilize Richards' ideas as a way to characterize word knowledge, and some theoretical research projects have as their foundation that of Richard's vocabulary knowledge framework (Ellis, 1995). However, Richards himself maintained a distinct

caution in linking research and pedagogical practice, the reason being that the applied and theoretical linguistics does not necessarily lend itself well lead to new and exciting discoveries in vocabulary teaching (Meara, 1996, pp. 1-2).

The long history of the study of word knowledge leads to the conclusion that vocabulary knowledge is a multidimensional construct that can only be conveyed within a knowledge framework. In fact the vocabulary has dimensions that are quantitative and qualitative; this knowledge is both incremental and cumulative, both receptive and productive, and probably has not been accepted in full. As far as vocabulary knowledge in English, Nation's taxonomy (2001, p. 27) provides a useful and influential guide to what it means to know a word (Milton & Fitzpatrick, 2014)

Research on Vocabulary Assessment

Not only do English language learners have an immense task of acquiring a large number of new words to add to their lexicon, but there are many aspects that learners need to know in order to have a complete command of the words. Therefore, assessing vocabulary has become a persistent need for its essential role in developing strategies for the process of vocabulary learning.

A noticeable shift has occurred in vocabulary research during the last few decades. Specifically, some researchers have attempted a variety of methods to investigate vocabulary size and depth of word knowledge. For example, Laufer and Paribakht (1998) claimed that there is wide variance in the definition of lexical knowledge as it applies to vocabulary acquisition, depending on the nature of the task and the instrument used to measure it. For example, lexical knowledge, which enables the

effective use of words in sentences and discourse, is different from the ability to select meanings in a multiple-choice test. Most researchers agree that lexical knowledge should be considered as a continuum rather than an all-or-nothing matter, that is, either knowing or not knowing a word. The continuum starts as vague familiarity with a word and continues to the ability to use the word in free production. The researchers maintain that although receptive vocabulary develops in a variety of ways, it does not necessarily develop in parallel with productive vocabulary.

Like Laufer and Paribakht (1998), Laufer (1994) supported that the process of learning a second language is often explained in terms of a learner's development along the interlanguage continuum, from knowing nothing of the L2 towards a native-like competence; in this view of language acquisition, the research would have to account for the increasing vocabulary of the learner. The most notable distinction between the vocabularies of native speakers and L2 learners is the number of words they can produce in speaking or writing. About this, Laufer posited that there are almost no longitudinal studies regarding the development of productive lexicon, and that this is unfortunate because it would provide two key pieces of information, "a. information about the lexical increase in the course of learning and b. information about a possible improvement in the writing quality" (Laufer, 1994, p. 21). She believed that, since writing quality and lexical quality are interrelated, writing progress could be measured through lexical progress.

As stated earlier, researchers have approached vocabulary from different perspectives, leading to some controversies among researchers about the different approaches used to assess the lexicon. An example of this is found in Read and Chapelle's (2001) study, which claimed that the nature of vocabulary as a construct is ill-

defined; different authors approach vocabulary from different perspectives, resulting in various, mostly non-explicit, assumptions about the lexical dimension of learners' language. Their first perspective was about some of the pioneers of the research, such as Laufer, Nation, and Meara, and argued that these researchers investigated size and growth of ELLs' vocabulary by "counting, classifying and assessing knowledge of individual word forms" (Read & Chapelle, 2001, p. 2). Instead, Read and Chapelle asserted that words should be incorporated with all aspects of language knowledge, such as grammar and discourse. Another perspective that surfaced in the late 1990s came from Singleton (1999), who argued that vocabulary research should not be limited to measures involving only knowledge of individual content words. Singleton went on to point out that vocabulary teaching should also be expanded. A third perspective that is noted by Read and Chapelle is credited to Peter Skehan (1996) and his associates, who, while not directly investigating vocabulary such as mentioned above, inadvertently found lexical measures to be useful in their analysis of type of task and the effect the amount of planning time had on linguistic results. Skehan developed a theoretical framework which explained how memorized lexical units play a significant role in L2 writing production at the beginning stages of language acquisition as well as in the development of native-like fluency in the later, more advanced stages (Skehan, 1996, p. 41).

In fact, Laufer and Nation's (1995) study aimed at measuring lexical knowledge to quantify a writer's use of variation and number of vocabulary words. They reported that their interest in these measures had been primarily to distinguish factors that affect quality in writing and to study the relationship between knowledge of vocabulary and the use of vocabulary. They argued that if lexical knowledge is to any substantial part

affected by factors other than vocabulary size, which cannot be controlled, it may not be possible to reliably measure vocabulary knowledge, thereby making the existing measures of little or no use to researchers or teachers.

Among the different methods used by researchers to assess vocabulary size are dictionary-based methods, which were criticized for providing inaccurate results. However, in their study Goulden et al. (1990) demonstrated some of the methodological problems that were encountered by vocabulary size studies that are based on dictionary sampling methods. For their study, they summarized the factors that contributed to the occurrence of these problems, such as how to decide which words count as words, what words to choose for testing, and by what method to test the chosen words (Goulden et al., 1990, p. 343). Then, they chose *Webster's Third New International Dictionary* (1961) for their analysis because it was larger than other dictionaries of English and did not contain historical terms. For the testing, they considered base words only in their sampling method, justifying that, for example, a learner who knows the meaning of the word *govern* needs less effort to learn the meaning of *misgovern* (p. 344). The researchers excluded many words that they listed under a category they called *others*, such as proper words, compound words, derived words, and various items (p. 350). They divided words according to their frequency levels into five tests. Each test contained five items and knowledge of each item represents knowing 500 words. By examining these lists with 20 graduate-level native speakers of English, the researchers found that the mean score was 17,200 words.

A similar method was used by D'Anna et al. (1991), who also focused on how vocabulary size estimation studies using dictionary sampling methods have vastly

disparate results. They based the words they chose for their study on sampling the *Oxford American Dictionary* (*OAD*), which they considered the most practical English dictionary for word sampling. In the *OAD*, words are classified under main entries. In their methodology, they eliminated the three major categories that they claimed many other studies failed to contemplate, which were scientific words, proper names, and archaic or very rare words. Their selection yielded 26,901 main entries and two lists of words (A and B), each of which consisted of 200 words. Of the 200 words in each list, 191 were real words represent the random sample of the entire word list and nine were non-words. The nine non-words were added on the two lists by the researchers as a control measure for validity. To get vocabulary size estimation, participants rated each word as known or unknown. Then, the resulting number of known words was multiplied by the main entries number 26,901 and divided by 191. Their research indicated that the best estimate of vocabulary known by native English speaker college students was 16,785 words.

As pointed out earlier, many researchers focused on investigating and developing measures for the dimension of depth of word knowledge. One of the pioneers in this kind of research is John Read. For example, in his (1993) study, Read started developing measures that investigate what he called quality of knowledge through associations between words basing his choice of words on the University Word List (UWL) from Nation (1990).

In this method, two lists of target words, each of which has 50 words, is followed by a set of eight words. Each target word on the list has only four correct associates. Two different types of associations, synonyms and collocates, are included to specify the connection between the target word and the associates. Therefore, the relationship either

denotes mutually exclusive choices between the target word and the associate words (paradigmatic) or denotes sequential choices to make well-formed structures (syntagmatic) (Read, 1993, p. 359). In addition, the relationship between the word and the associate could be analytic, which denotes part of the dictionary definition of the word - for example, *team – together*. Read assumed that high-frequency words have a larger association network than low-frequency words. Furthermore, learners who have deeper knowledge of the word are expected to be better in their ability to choose the associates than learners who have superficial knowledge. Read used the word *distractors* to refer to the 4 words that have no association with the main word. He also called the target word a *stimulus*. In order to assure that the test-takers would not be presented with different levels of difficulty for each word and its associates, the researcher was careful in checking that all words, including the associates, the distractors, and the stimulus, were at the high frequency level. Later, Read (1998) modified the above version and created one list of 40 target words to measure learners' depth of word knowledge.

To conclude, the abovementioned and many other studies confirm that there has been extensive research that has focused on the lexical development from different viewpoints. Most of these studies have led to the development of many successful tools, such as the *Word Associates Test* in several editions (Read, 1993, 1998), the *Self-Rated Vocabulary Test*, which also appeared in several versions (D'Anna et al., 1991; Zechmeister et al., 1993, 1995, 1998), and others. Some of these tools are explained in more details within studies in the next section.

Vocabulary Assessment Tools

As part of the study of vocabulary acquisition, researchers have been working on a variety of tools to assess the different dimensions of vocabulary. For example, in his investigation of word knowledge construct, Read (2004) focused on three approaches to language vocabulary assessment: precision of meaning, comprehensive word knowledge, and network knowledge. Precision of meaning refers to the understanding of vocabulary words. For example, multiple-choice answering and self-reporting of degrees of understanding (such as the *Vocabulary Knowledge Scale* (VKS) developed by Paribakht & Wesche, 1993; Wesche & Paribakht, 1996) are popular methods of assessing precision of meaning understanding. Comprehensive word knowledge takes a more inclusive view of vocabulary words with focus placed on pronunciation, spelling, word parts, word associations, and grammatical functions. Network knowledge considers how newly-acquired words are accommodated within a network of existing language understanding. Within this network, learners need to be able to pronounce the word, recognize it in connected speech and writing, and use it fluently in their own production. Therefore, "Measures of declarative knowledge need to be complemented by tests of vocabulary in use of order to obtain a full picture of the learners' lexical competence" (Read, 2004, p. 224).

One of the remarkable tools that investigates learners' word knowledge is the *Computer Adaptive Test of Size and Strength* (CATSS) developed by Laufer et al. (2004). The researchers explained that vocabulary tests are important for determining learners' knowledge in both breadth and depth. They also indicated that understanding how to link word form to word meaning is important for language learners. Therefore, CATSS

focused on four areas: vocabulary size, vocabulary strength, computer adaptiveness, and scoring. Sample words from five levels of word frequency (2,000, 3,000, 5,000, 10,000, and (AWL)) were used to determine the vocabulary size of the participants. To test vocabulary strength, four modalities were scored: active recall, passive recall, active recognition, and passive recognition. Computer adaptiveness refers to programming that keeps words in memory for the next modality if not answered correctly in previous questions, and scoring methods were scrutinized to make sure results are recorded in the most effective manner. According to their findings, the researchers indicated that the final version of CATSS can function as a beneficial and effective tool for measuring vocabulary knowledge using the form-meaning relationship.

Hellman (2008) investigated the lexical development of adult speakers of English as a second language through the framework of vocabulary size and depth of word knowledge. Her participants consisted of three groups. The first group was 33 adults who learned English as a second language, the second group was 30 participants who spoke English only, and the third group was 30 bilinguals who spoke English and another different language as their native languages. The second and the third groups were recruited by the researcher as controls for her analyses and comparisons of the results. In her methodology, she used three different kinds of tests to measure vocabulary size and depth of word knowledge: *The Peabody Picture Vocabulary Test*, *Fourth Edition* (aural test) and the *Self-Rated Vocabulary Test* (SRVT) to measure vocabulary size, and the *Word Associates Test* (WAT) to measure depth of word knowledge. However, Hellman piloted two studies to ensure the validity and reliability of *WAT* because the words on the original test were based on New Zealand English. Therefore, she modified the test to

eliminate the problems she noticed in her pilot studies, such as wrong associations, effect of cultural differences between the US and New Zealand, and other distractors which required credit even when they were wrong (Hellman, 2008, p. 98).

Further, Hellman changed the test directions and the self-report categories on the SRVT to reduce the effect of several problems she noticed through piloting the test, such as choosing the non-words on the test and the confusion associated with the way that some words are spelled (for example, the confusion of *spirit* for *sprit*) (Hellman, 2008, p. 94). Finally, she asked participants to think of definitions or examples for only ten words they rated as known because defining all the known words would affect the practicality of the test and require too much time from the participants (Hellman, 2008, p. 95). While her results indicated that the adult speakers of English as a second language showed a significant difference from the two control groups on the aural test (PPVT), they attained the level of native speakers on the WAT and SRVT because the their scores were not significantly different from those of the native speakers. Hellman's study supported the validity and reliability of the instruments used to measure the lexical attainment.

A word's frequency level is a principal factor in the process of vocabulary acquisition. The higher a word's frequency, the easier it is to learn. In this line, Laufer and Nation (1999) introduced the *Productive Vocabulary Levels* Test, which incorporated five frequency levels of words (2,000, 3,000, 5,000, 10,000, and the AWL). They based the structure of the test on the *Vocabulary Levels Test* (Nation, 1983, 1990) with three other parallel versions they adapted from Norbert Schmitt (Laufer & Nation, 1999, p. 37). They conducted two studies to estimate the validity of the test and evaluate the versions of the test.

In the first study, four groups of EFL students were recruited: 24 tenth graders, 23 eleventh graders, 18 twelfth graders, and 14 first-year university students. The test was based on what the researchers called "controlled productive vocabulary", which means using words in a writing task or a fill-in task (Laufer & Nation, 1999, p. 37). On the other hand, "free productive vocabulary" indicates using words without constraints or contexts of use. Before administering the test to the four groups of the study, the researchers piloted the test with a group of three native speakers to determine the difficulty level and suggest modifications. Then they piloted the test again with seven native speakers to ensure the reliability and measure the difficulty level of the test. At the final stage, the test was administered to four groups of participants. The descriptive statistics of their results showed that, according to word frequency, scores increased as the proficiency levels of participants increase and vice versa. Further, the researchers explained that, for the 10,000 word frequency list, significant difference appeared in the results of the university students only. For this study, the researchers suggested that this test was valid and practical because of its easiness and the short time it required

The second study measured the equivalence of the four versions that Laufer and Nation (1999) suggested for comparison. In this section, four groups of participants who had different proficiency levels were selected to participate in the study. Each of the four groups was tested with only one level of these four levels: 2000, 3000, 5000, AWL, but according to the four versions of the test. In other words, the first group was tested with four versions of the 2000-word level, the second group with four versions of the 3000-word level, and so on (Laufer & Nation, 1999, p. 41). Their results indicated the

reliability and practicality of the four versions for measuring the controlled productive vocabulary for diagnostic purposes, while they stressed using two versions for testing.

To conclude, as it has been shown in this chapter, researchers made different tools available for further research. These tools not only serve as measures for the lexical development of language learners, but also as means for enhancing the process of learning. While lexical knowledge represents a principal factor for successful English language learning, it is not a stressed element in most EFL contexts. Therefore, it is necessary to conduct more studies on the acquisition of vocabulary especially in EFL environments.

METHODOLOGY

Research Design

This cross-sectional study was designed to investigate the growth of vocabulary size and depth of word knowledge in EFL at the university level in Iraq. The 120 participants were students from a four-year university in Iraq representing each year of study. The number of participants allowed for statistical analyses. Every student was a pre-service teacher of English. Prior to being admitted to the university, all students have studied English from elementary school to high school. The ages of the participants were 18-22; all were full-time students. Participants included 30 students from each of the four years of study, 120 in total (n = 120). However, in order to assure the reliability of the results, the total number of participants included in the analysis was smaller, as explained in details in the data analysis section.

All participants were native speakers of Iraqi Arabic, who were learning English as a foreign language under similar conditions, namely regular EFL classrooms in Iraq. All participants had a minimum of 12 years of exposure to English in Iraqi schools, where the language of instruction was Arabic. For the present study, all participants completed two lexical tasks; one measured vocabulary size and the other measured depth of word knowledge. Both tasks were written and provided to participants in testing packets. Prior to performing the lexical tasks, participants completed a questionnaire and an informed consent form. The purpose of the questionnaire was to collect learner background information including gender, first language, parents' educational attainment,

and language learning variables. The purpose of the informed consent was to explain the benefits and risks of participation.

The tests scores were analyzed to determine whether Iraqi pre-service teachers show a significant growth in their vocabulary size and depth of word knowledge over four years of EFL instruction. Quantitative tests were used to investigate the relationship between the lexical development and language practice variables. In addition, variables from the questionnaire data were used to calculate their correlation with participants' lexical development scores. The same test administrator, a faculty member from the Iraqi university conducted the recruitment and the testing for the study.

Participants

This project received prior approval from the Missouri State University IRB (#16-0064; Sep 24, 2015). Participants in this study were 120 learners of English as a foreign language in Iraq, 30 from each year of study. The 30 participants in each group were selected randomly from the total of 80-100 students in their grade at the Iraqi university. The university where the study was carried out is a highly selective, prominent institution of higher learning. Participants were studying in a teacher education program within the English department. Admission to the university is based on outstanding academic achievement in high school. In addition, there are specific admission tests for every major. When students are admitted to the program, they already have some proficiency in English. Those who are admitted in the major are the highest scorers on the university's English language admissions test. T1 shows the distribution of participants by year of study.

As shown in T1, the number of female participants was 78 (65%), and the number of male participants was 42 (35%). The total gender ratio is representative of English language majors across Iraqi universities.

Test administrator and Selection of the Participants

The test administrator was a faculty member from the university's English department. He agreed to administer the tests and was provided with all necessary information about the study. The researcher instructed the administrator to ascertain that all participants sign the informed consent form voluntarily. The administrator assigned a code for each participant on the questionnaire and the tests in order to protect participants' anonymity. The administrator verbally explained the purpose of the study, as well as the benefits and risks of participation. Participants were allowed withdraw from the study at any time.

The administrator randomly selected 30 names from each grade and invited those participants to volunteer for the study. If anyone declined, that participant was replaced by another randomly selected student in the same year of study. The purpose was to ensure that the sample was representative of the pre-service teachers at the institution. In fact, the administrator reported that none of the selected participants declined to participate in the research.

Instruments and Questionnaire

Following the methodology of Hellman (2008), the growth of vocabulary in this study was investigated in terms of vocabulary size (the number of known words) and

depth of word knowledge (how much is known about a set of target words). To obtain variables, two paper and pencil tests and a questionnaire were used in this study. The *Self-Rated Vocabulary Test* (SRVT) measures vocabulary size and the *Word Associates Test* (WAT) measures depth of word knowledge. The *Word Associates Test* was originally developed, validated, and published by Read (1993, 2004). Hellman (2008) revised one version of the test with Read's supervision. In this study, I used the versions of the WAT and SRVT that Hellman (2008) revised and modified in her study. Hellman eliminated several technical issues with the earlier versions. She also modified the testing directions on SRVT, which made it easier to understand for the participants. For further details about the instruments used in this study, see Chapter 2 and Hellman (2008). Finally, I added a questionnaire to collect demographic data and variables related to vocabulary learning. The next section details the purpose and structure of the questionnaire.

The questionnaire, which included two parts, was self-designed to measure variables related to individual differences and means of practicing and learning English. The first part included demographic information, such as gender, age, and level of education. In the second part of the questionnaire, the participants responded to seven questions on a 3-point Likert scale to report on their practicing and learning English on a daily basis. The participants were informed that their responses should be carefully considered and they should select the answers that best reflected their practice activities. The researcher added an open-ended question that required participants to report on their primary methods of learning new words in English. In all, the information provided

through the questionnaire helped the researcher construct a learner profile of each participant.

Procedure and Scoring

The administrator received the testing materials electronically. He agreed to assemble the testing packets for the 120 participants. Participants completed the tests in the following order: (1) the consent form and the questionnaire (10 minutes), (2) SRVT (25 minutes), (3) WAT (25 minutes). An exception to the amount of time provided above was that the administrator needed an extra ten minutes to explain the tests to first-year students. The tests were done in the participants' regular classrooms. The original plan was to transmit the data from the administrator to the researcher electronically. The forms of each participant were to be coded prior to electronic transmission. The questionnaire and the two tests were to be merged into a single .pdf document using a smart scanner. These data were to be sent to the researcher via secured email attachment. However, because the administrator was unable to scan the large number of lengthy files and merge them correctly, the researcher asked the administrator to make an extra copy of each testing packet including the informed consent, and send the originals in a box via express mail. The purpose of the extra copies was to secure the data in case the originals were lost or damaged during the transportation. After the packets were delivered to the researcher unopened and undamaged, the administrator was instructed to properly dispose of the copied forms.

The administrator did not score the tests or know the results of individual participants. The researcher scored all the tests after the submission was complete. To

ensure accuracy of the scoring, the researcher used an answer key. Ten percent of the tests (12 testing packets) were scored by an assistant to establish inter-scorer reliability. The data gathered from the *Self-Rated Vocabulary Test* were scored according to the number of words selected as known words by participants with 191 as the highest possible score. Different criteria were applied to the data that were gathered from SRVT to ensure the reliability of the results. Further explanation of these criteria will be provided in the data analysis. The *Word Associates Tests* were scored using an answer key with 160 as the highest possible score. On the questionnaire, the first part was scored on a 3-point Likert scale. The second part of the questionnaire, which consisted of seven questions, was scored according to the following criteria:

0.0 = none
0.5 = less than one hour
1.0 = 1-2 hours
3.0 = more than 3 hours

On the questionnaire, the mother's education level was scored in the following manner: primary education was given six points and for each additional year of education one point was added.

Data Analysis

Data were analyzed by using the Statistical Package for the Social Sciences (SPSS) for Mac Version 23. A two-way MANOVA test was used to evaluate the research question. The researcher published a correlational table to explore individual learner variables and the dependent variables. There were three individual learner variables (independent variables): mean score of self-reported practicing and learning English, hours of reading English daily, and mothers' years of education. The dependent variables were scores on

the two vocabulary tests. To measure vocabulary size, the test score was multiplied by 26,901 (the population of words sampled), then divided by 191 (the sample size) (Hellman, 2008, p. 91). Depth of word knowledge was measured by counting the correct number of associates of each of the 40 words. Like Hellman (2008, 2011), the test directions on the *Self-Rated Vocabulary Test* were the following:

> On the following list, there are also words that are not real words. Please be careful with these words. If you rate non-words as familiar, I will not be able to use your data.
>
> Please treat every word as it is spelled. The spelling of each word was carefully checked. There are no spelling errors.
>
> At the end, you will be asked to explain the meaning of some words that you rated 4, 5, or 6. Please rate the words carefully.

The researcher used the following self-report categories, which were used in Hellman (2008), with the OAD sample wordlist:

> 1 = "I have never experienced the word." 2 = "I have seen or heard the word before, but I do not know its meaning." 3 = "I have a vague idea of the meaning." 4 = "I would recognize the meaning, but I cannot define the word." 5 = "I think I know the word enough to explain its meaning, give its definition or native language translation." 6 = "I know this word well enough that I could comfortably use it in my own speech or writing.

Test takers were instructed to think of an explanation, definition, or translation before choosing answer 5, or think of a sentence in which they would use the word before selecting answer 6 (Hellman, 2008, p. 93). Therefore, in order to get more accurate results from the test the following criteria were applied:

- Participants who chose three or more non-words on the test were excluded from the analysis.
- Participants who rated three or more words with 4, 5, or 6 without explaining the meaning of those words on the other list, were excluded from the analysis.

- Participants who skipped more than 10 items without rating were excluded from the analysis.

In the WAT the following criteria were applied:

- Participants who skipped more than ten words in a row without answers were excluded from the analysis.
- Participants who chose one associate instead of four for ten words or more were excluded from the analysis.

The reason for excluding some results according to the above criteria from the analysis was that the study was set to investigate the actual growth of vocabulary size and depth of word knowledge. The test scores of participants who could not provide correct explanations for words that they indicated that they knew were judged unreliable and were excluded from the analysis. Only those participants who completed both tests by providing a definition or example for each word they rated as known in SRVT and did not skip the specified number in the above criteria were included in the analysis. Consequently, the testing packets of 25 participants were excluded from the study; five females from the first group of participants, three males and two females from the second group of participants, four males and two females from the third group of participants, and three males and six females from the fourth group of participants. Out of the excluded 25 participants, there were 16 participants who chose more than three non-words on SRVT words list. Other participants were excluded for committing a variety of errors from the criteria above, for example, ignoring a whole page from one of the tests or rating more than three words as known words without giving any explanations of those words. The resulting number of participants after applying the above criteria was 95. T2 shows the distribution of participants in the study whose scores could be considered reliable and whose variables were included in the calculation of the results.

Summary of the Methodology

This study was designed to investigate the growth of vocabulary size and depth of word knowledge in Iraqi EFL students. To achieve the goals of the study, vocabulary size and depth of word knowledge were measured with previously published tests. Participants were randomly chosen to represent students across four years of study at a leading Iraqi university. Questionnaire data provided learner profiles and variables related to vocabulary learning from various English language practice activities. Careful steps were taken to establish inter-scorer reliability and to ensure that only those participants were included in the analyses whose test scores met the criteria established for the reliability of self-reported measures. The number of participants allowed for quantitative analyses of the results, which were calculated using the Statistical Package for the Social Sciences (SPSS).

Table 1. Distribution of All Participants by Year of Study

	Gender	
Year of Study	Males	Females
First-Year	5 (17%)	25 (83%)
Second-Year	11 (37%)	19 (63%)
Third-Year	10 (33%)	20 (67%)
Fourth-Year	16 (53%)	14 (47%)
Total	42 (35%)	78 (65%)

Table 2. The Distribution of Participants with Reliable Test Scores by Year of Study

	Gender	
Year of Study	Males	Females
First-Year	5 (20%)	20 (80%)
Second-Year	8 (32%)	17 (68%)
Third-Year	6 (25%)	18 (75%)
Fourth-Year	13 (62%)	8 (38%)
Total	32 (34%)	63 (66%)

RESULTS

Introduction

The main purpose of this study was to investigate the growth of vocabulary size and depth of word knowledge in Iraqi foreign language learners of English over four years of university instruction. Furthermore, a secondary purpose was to examine the role of learner variables on the lexical development of Iraqi learners of English. In this study, two vocabulary measures, the *Self-Rated Vocabulary Test* and the *Word Associates Tests*, were used to operationalize the two dependent variables, vocabulary size and depth of word knowledge. The main independent variable was the year of university study with four levels. In addition, other independent variables were collected from a questionnaire: hours of daily practice, hours of daily reading, mother's education, and gender.

Results

The main research question was: Is there a significant growth of vocabulary size and depth of word knowledge in Iraqi EFL students over the four years of university instruction? The main independent variable was years of university study with four levels and the dependent variables were vocabulary size and depth of word knowledge. Vocabulary size was calculated based on the scores of the *Self-Rated Vocabulary Test*, which tested students' self-reported knowledge of 191 words that represented a random selection of head words in the *Oxford American Dictionary* and which allowed for an estimation of vocabulary size in relation to all words included in this dictionary. Depth of word knowledge was operationalized as the total score on the *Word Associates Test*. To

determine the effect of year of study on vocabulary size and depth of word knowledge, I used a 4 x 2 multivariate analysis of variance (MANOVA). Significant effects were found among the four years of study on the two dependent measures, Wilks's $\Lambda = .61$, F (6, 180) = 8.56, $p < .0005$. The multivariate partial η^2 based on Wilks's Λ was large, .22. Table 3 contains the means and standard deviations on the dependent variables on the four groups. The results indicated a significant growth of vocabulary size and depth of word knowledge by a large effect across the four years of English language instruction among the Iraqi university students.

Analysis of variance tests (ANOVA) were conducted as follow-up tests to the MANOVA. Using the Bonferroni approach to control for Type I error, each ANOVA was tested at the .025 level. The ANOVA on the estimated vocabulary size was significant, F (3, 91) = 14.47, $p < .0005$, partial $\eta^2 = .32$ (very strong). The ANOVA on the depth of word knowledge was also significant, F (3, 91) = 9.61, $p < .0005$, partial $\eta^2 =$ .24 (large).

Follow-up tests were carried out to evaluate pairwise differences across the four years of study, with alpha set at .006 (.025 / 4 = .006) to control for Type I error over four pairwise comparisons. The differences between the first and fourth year students were significant even at this level on both vocabulary size and depth of word knowledge. First year students knew 727 fewer words than second year student (SE = 404), 1,624 fewer words than third year students (SE = 408), and 2,628 (SE = 423) fewer words than fourth year students. Second year students knew 897 (SE = 408) fewer words than third year students and 1,901 (SE = 423) fewer words than fourth year students. Third year students knew 1,004 (SE = 427) fewer words than the fourth year students. The 95 percent

confidence interval for the vocabulary size of first year students was 3,974 – 4,961 words (*M* = 4,468, *SE* = 239, *SD* = 1,196), for the second year students 4,732 – 5,656 words (*M* = 5,194, *SE* = 224, *SD* = 1,119), for the third year students 5,590 – 6,592 words (*M* = 6,091, *SE* = 242, *SD* = 1,186), and for the fourth year students 6,133 – 8,057 words (*M* = 7,096, *SE* = 461, *SD* = 2,112).

First year students scored 12.92 lower on the WAT than second year student (*SE* = 4.81), 15,01 lower than third year students (*SE* = 4.86), and 26.81 (*SE* = 5.03) lower than fourth year students. Second year students scored 2.09 (*SE* = 4.86) lower than third year students (non-significant) and 13.89 (*SE* = 5.03) lower than fourth year students. Third year students scored 11.80 (*SE* = 5.08) lower than the fourth year students. The 95 percent confidence interval for the WAT score was 57.49 – 70, 99 (*M* = 64.24, *SE* = 3.39), for the second year students 70.41 – 83.91 (*M* = 77.16, *SE* = 3.39), for the third year students 72.36 – 86.14 (*M* = 79.25, *SE* = 3.71), and for the fourth year students 83.69 – 98.41 words (*M* = 91.05, *SE* = 3.71). T3 indicates the mean scores and standard deviations of the two dependent variables for all students across the four years of study.

F1 captures the growth of the estimated marginal means in English vocabulary size across the four years of university study and F2 illustrates the increase in the depth of word knowledge in the same group of students. It appears that vocabulary growth is steady and may even be characterized as accelerating over the years, with students learning roughly 800 words during the first year, 900 during the second, and 1,000 during the third year of study. Likewise, improvement of depth of word knowledge is also evident, although growth is not linear but seems to occur in spurts with more dramatic increases during the first and the third year. F3 and F4 show the boxplots of the estimated

marginal means and the 95 percent confidence intervals for vocabulary size and depth of word knowledge.

To summarize the results pertaining the main research question, there was a significant difference in the mean vocabulary size and mean depth of word knowledge across the four groups of Iraqi university students, who majored in English; years of university study had a large effect on both dependent variables. The average annual gain in vocabulary size was 800-1,000 words per year with upper students making slightly larger gains annually than lower students.

To answer the second research question, I explored the descriptive statistics of four learner variables: hours of daily practice, hours of daily reading, mother's education, and gender. T4 presents the descriptive statistics for daily practice and reading. The mother's education statistic had missing values for eight cases; the mean for mother's education based on 87 valid cases was 10.80 years (SD = 4.37). T5 shows the correlations for learner variables and the two dependent measures. The correlation statistic for hours of daily practice, hours of daily reading, and gender were calculated based on 95 cases; the correlation of mother's education and the dependent variables was calculated based on the 87 cases with valid values. The large number of missing values was due to two orphaned students and six students who did not report the mothers' education. The correlations table (T5) indicates the significance level for each Pearson r value. With four correlations computed, it is desirable to correct the significance level in order to avoid Type I error by dividing the .05 p value by 8 and declaring .006 significant. The correlation between estimated English vocabulary size and hours of daily practice was significant, r (93) = .45, p < .001. Similarly, the correlation between depth

of word knowledge and hours of daily practice was significant as well, r (93) = .45, p < .001. Hours of daily reading correlated significantly only with the estimated English vocabulary size (r (93) = .34, p < .005) but not with the WAT score. No other correlations approached significance with the exception of the mother's education level and estimated English vocabulary size, which may be considered marginally significant without the Bonferroni correction, r (85) = .22, p < .05. Gender had no role whatsoever in any of the learner or dependent variables. Contrary to popular assumptions about gender differences, this study found that both genders were equal on hours of daily practice, on hours of daily reading, as well as on both lexical achievement measures (vocabulary size and depth of word knowledge). Figures 5-8 illustrate this equality clearly.

While gender had no relationship to lexical achievement, hours of daily practice had a significant correlation to both vocabulary measures. F9 illustrates the relationship of vocabulary size and hours of daily practice. From the boxplot of scores, it appears that daily practice may have a dosage effect in which 2-3 hours of practice and 3-5 hours of practice make a difference of 1,000 words, or approximately the equivalent of an entire year of university study. More than 5 hours of practice would result in an additional 1,000-word vocabulary. It appears that every two hours of daily practice may equal the effect of an entire school year in terms of vocabulary gain. The same may also be true for depth of word knowledge as shown in F10, although the effect is slightly more subtle with the WAT scores. Daily reading has a definite effect on vocabulary size but not to WAT scores (F11). Additionally, hours of daily practice differs across years of study, with first and second year students practicing significantly less than third and fourth year students as demonstrated in F12.

Students' responses to the questionnaire were informative regarding their methods of language practice. First, 66 (69%) students reported that the primary method of learning new words in English was translating the unknown words into Arabic, which indicates using English-Arabic dictionaries for that purpose. For example, a student remarked that whenever she reads poetry, she writes the meanings in Arabic above the unknown words to understand the poem. A similar strategy was followed by 27 (28%) students, who reported that they learn the new English words through translation and reading, but they did not specify the types of dictionaries they use. Two students did not report their primary methods of learning new words in English. Second, 87 (92%) students indicated that they do not listen to recorded or live audio programs in English, while the other eight rated this variable with *less than one hour*. Third, 41 (43%) participants reported that they do not watch movies or programs in English at all. Fourth, five students rated reading on a daily basis with zero hours, and another eight students practice reading *less than one hour* a day. Fifth, listening to songs and surfing English websites in English were the least practiced variables because only three student rated the former with *less than one hour* a day, and two students rated the latter with *less than one hour* a day. Finally, 91 (96%) students rated chatting or conversing in English with at least *less than one hour* a day. Apparently, reading was the most practiced variable among the language learning variables. These findings suggest several implications for vocabulary learning and will be further discussed in the last chapter.

In conclusion, the learner variable that had definite connection to vocabulary achievement was hours of daily practice; hours of daily reading was clearly related to vocabulary size but not to depth of word knowledge as that construct is represented by

the scores on the *Word Associates Test*. The effect of daily practice appears to be very strong. It may surprise some that gender was not relevant for either learner variables or for lexical outcomes. Males and females practiced equally and achieved equally in the area of vocabulary learning.

Discussion of Results

Two variables that are related to lexical development were examined in this study in an EFL context. The first variable was vocabulary size and the second variable was depth of word knowledge. In addition, the study examined the relation between these two lexical variables and language practice variables. The results revealed that Iraqi pre-service teachers of English showed a significant development in both variables, vocabulary size and depth of word knowledge, over four years of English instruction. Interestingly, the results also revealed that reading scores did not correlate significantly with depth of word knowledge, while they significantly correlated with vocabulary size increase. This fact, however, may point to the features of the focus words on the WAT rather than indicate that reading does not contribute significantly to the development of deeper word knowledge. On a case by case basis, participants who reported higher practice and reading scores on the questionnaire tended to achieve higher scores on both lexical tests. Additionally, most participants reported that they use bilingual dictionaries to translate unknown words while reading as the primary method to learn new words in English. Mother's education variable showed marginal significance on estimated vocabulary size. In the present study, male and female participants showed virtually identical performance on the two tests and the language practice variables.

Although previous research investigated vocabulary size and depth of word knowledge in different contexts, the context and instruments used in this study were new as compared to previous studies. For example, Hellman (2011) used the same instruments to examine whether successful adult immigrants who had been immersed in English over a long period of time were comparable to native speakers on these lexical measures. She found that decades of interaction with native speakers paired with a habit of daily reading of a variety of texts could result in nativelike lexical attainment even in adulthood. In contrast, in this present study, participants were students in an EFL context who had limited exposure to the target language, mainly through classroom instruction and practice. Nevertheless, the present study also confirmed what Hellman (2011) indicated in her study that reading and daily practice do lead to predictable steady growth in vocabulary size and depth of word knowledge. Hellman reported that native level achievement on the *Self-Reported Vocabulary Test* was 143.78 (*SD* = 18.02), the equivalent of a vocabulary size of 27,462 words (*SD* = 3,442). The native level mean on the *Word Associates Test* was 149.95 (*SD* = 6.07). In this study, the fourth year university students in Iraq achieved a vocabulary size of 7,096 words (*SD* = 2,113), which is approximately 20,000 words below the vocabulary size of a university educated native English speaker. The Iraqi fourth year university students' mean achievement on the WAT was 91.05 (*SD* = 17.65), which is 59 points below the college educated native English speakers' mean score. The results indicate that for Iraqi learners possibly 20 additional years of daily language practice and regular reading may be necessary to achieve nativelike vocabulary in English as a foreign language. On the other hand, a vocabulary size of 7,000 words is suitable to comprehend some original texts in English

independently and it is an adequate vocabulary size for most verbal communication about general interest topics. Clearly, setting the lexical goals at native level vocabulary achievement is not realistic for most but a few exceptional learners.

Another somewhat similar study was conducted by Rashidi and Khosravi in (2010), who investigated the influence of vocabulary size and depth of word knowledge on participants' performances in reading comprehension. The researchers revealed that participants who have better knowledge of words and larger number of vocabulary achieved better scores on the reading comprehension task. Like the present study, other researchers (Chen, 2011; Horst & Meara, 1999; Hunt & Beglar, 2005) acknowledged the positive relationship between reading and vocabulary size increase. The results of the present study are comparable to the study conducted by Hatami and Tavakoli (2012), who reported that vocabulary size mattered more than depth of word knowledge in inferring the meanings of words in contexts.

Summary of Results

This chapter has provided an explanation of the results and discussed them with reference to the two research questions of the study. A brief discussion of the results with reference to previous research supported the notion that language practice variables have a positive influence on vocabulary learning. In all, the findings of the present study indicated a significant influence of language practice variables including reading and participants' lexical performances. However, as stated earlier, there was a gradual and rather slow depth of word knowledge attainment between the second-year and third-year participants. Also, reading scores did not positively correlate with the depth of word

knowledge as that construct is operationalized by the *Words Associates Test*. Therefore, the present study agreed with the findings of previous research on two notions. First, the growth of vocabulary size is faster and more salient to detect than the growth of depth of word knowledge. Second, even though reading is considered to be the best source of vocabulary acquisition, it does not fully help learners increase their knowledge of words and general daily language practice that involves a variety of skills and communication modes may be a more important source of vocabulary growth at least when learners know fewer than 8,000 words. Then, it can be concluded that all language skills should be incorporated in the process of vocabulary learning and higher dosage of daily practice can multiply the lexical outcomes of language instruction.

Table 3. Mean Scores and Standard Deviations on the Dependent Variables for the Four Groups of Participants

		Estimated Vocabulary Size (Words Known)		Depth of Word Knowledge (WAT Score)	
Year of Study	n	Mean	SD	Mean	SD
First-Year	25	4,468	1,196	64.24	17.72
Second-Year	25	5,194	1,119	77.16	17.14
Third-Year	24	6,091	1,186	79.25	15.38
Fourth-Year	21	7,096	2,113	91.05	17.65
Total	95	5,650	1,709	77.36	19.18

Table 4. Descriptive Statistics of Learner Variables

Year of Study	Mean Hours of Daily Practice	Mean Hours of Daily Reading
First-Year (n = 25)	2.98 (*SD* = 1.19)	1.20 (*SD* = .98)
Second-Year (n= 25)	3.18 (*SD* = .97)	1.70 (*SD* = 1.11)
Third-Year (n = 24)	3.79 (*SD* = .85)	2.31 (*SD* = 1.00)
Fourth-Year (n = 21)	4.17 (*SD* = 1.19)	1.81 (*SD* = 1.08)
Total (n = 95)	3.50 (*SD* = 1.08)	1.75 (*SD* = 1.10)

Table 5. Correlations among the Learner Variables

Lexical Measure	Hours of Daily Practice	Hours of Daily Reading	Mother's Education	Gender
Vocabulary Size	.45*	.34**	.22***	ns.
Depth of Word Knowledge	.45*	ns.	ns.	ns.

* $p < .001$, $N = 95$; ** $p < .005$ $N = 95$; *** $p < .05$, $N = 87$

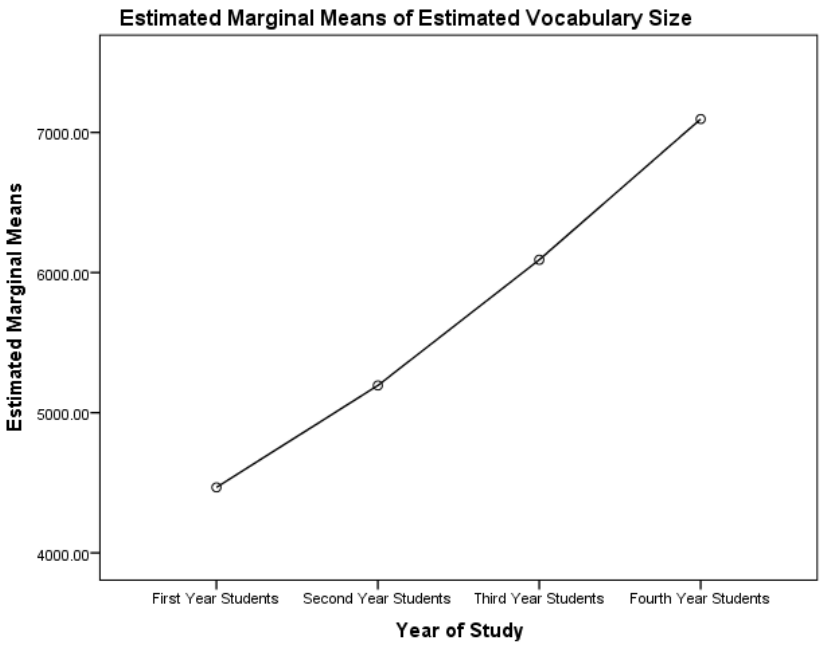

Figure 1: The Estimated Marginal Means of Vocabulary Size Based on the *Self-Rated Vocabulary Test*

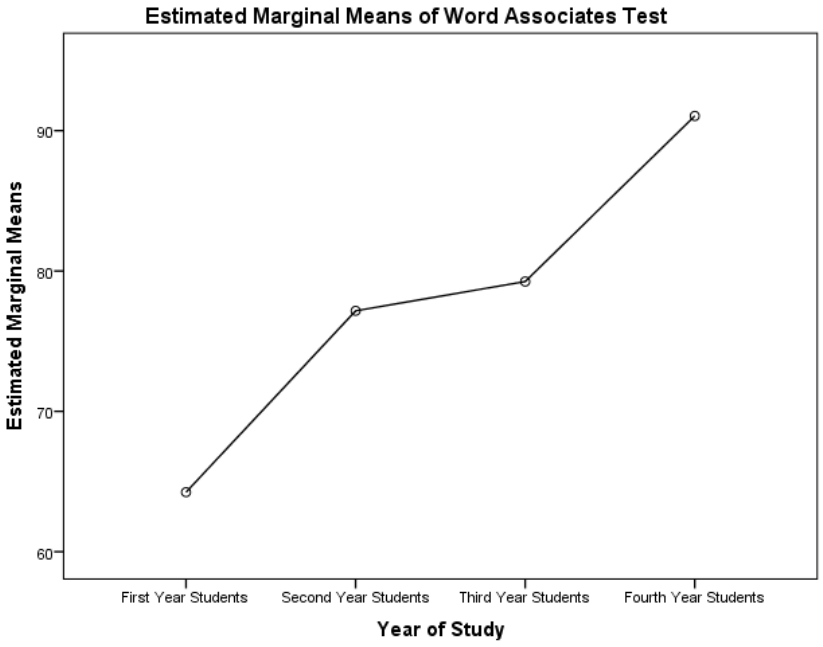

Figure 2: The Estimated Marginal Means of the *Word Associates Test* of the Four Groups of Participants

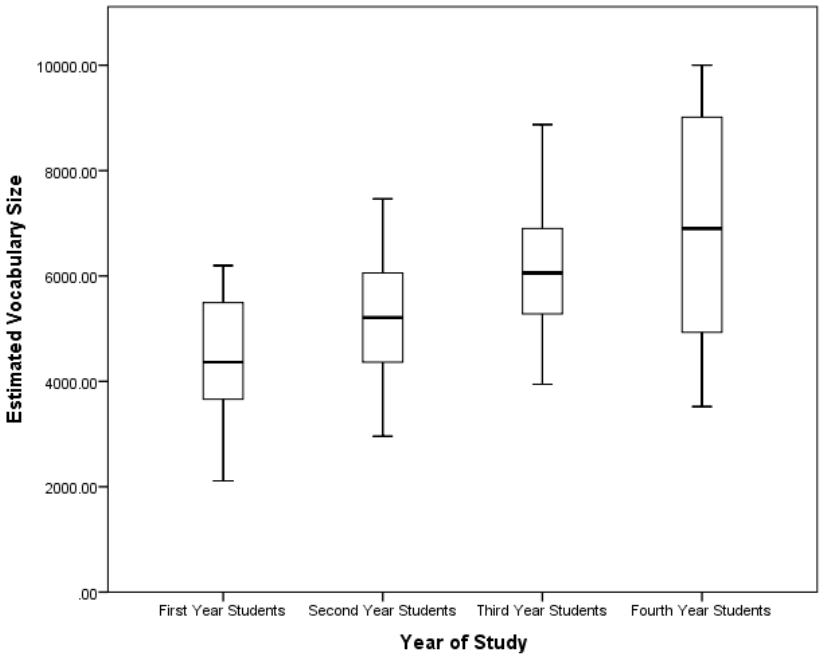

Figure 3: The Means and the 95 Percent Confidence Interval for Estimated Vocabulary Size

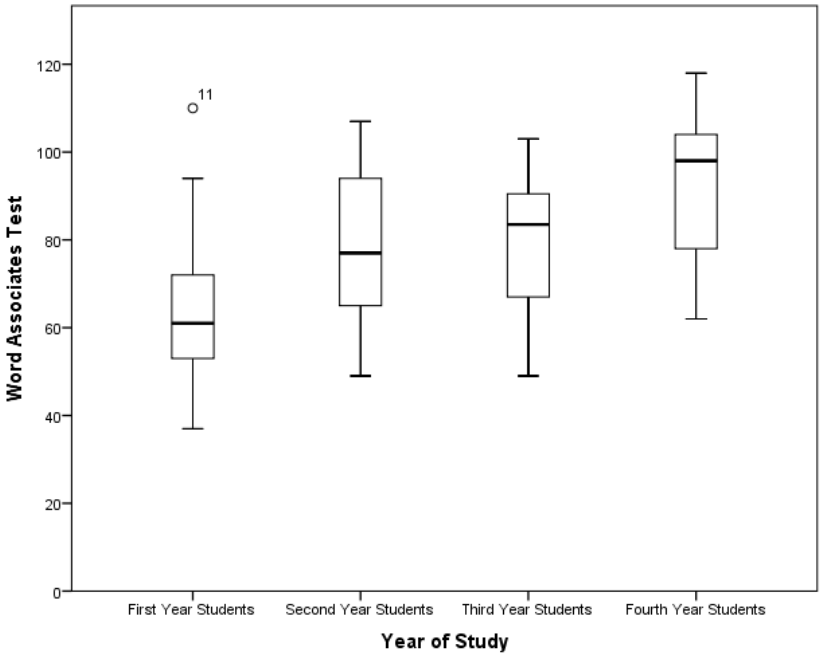

Figure 4: The Means and the 95 Percent Confidence Intervals for Scores on the *Word Associates Test*

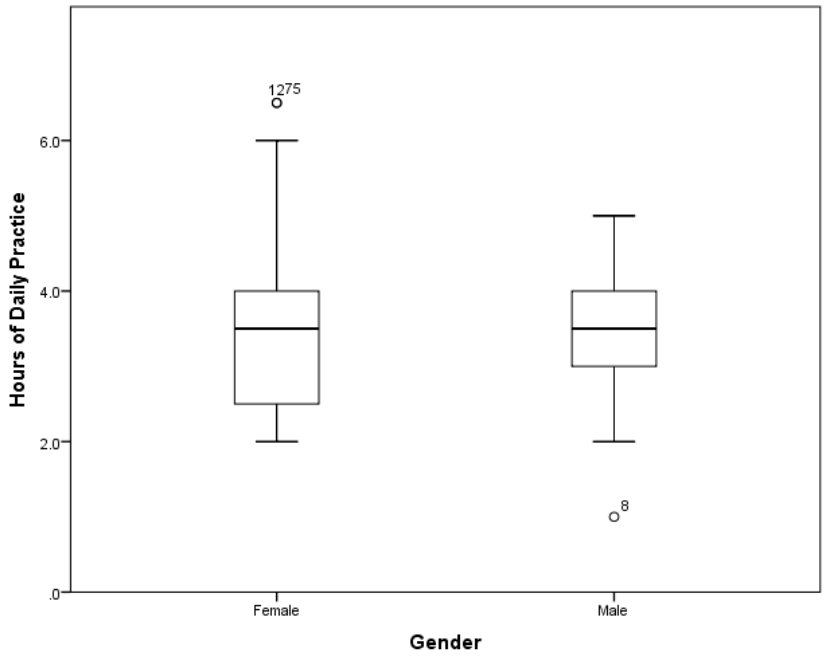

Figure 5: The Means and 95 Percent Confidence Intervals for Hours of Daily Practice by Gender

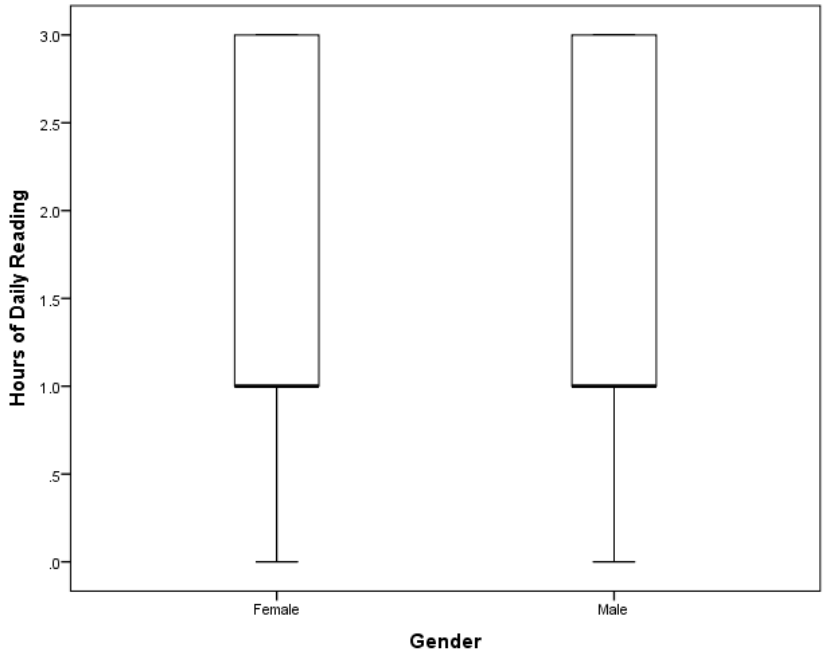

Figure 6: The Means and 95 Percent Confidence Intervals for Hours of Daily Reading by Gender

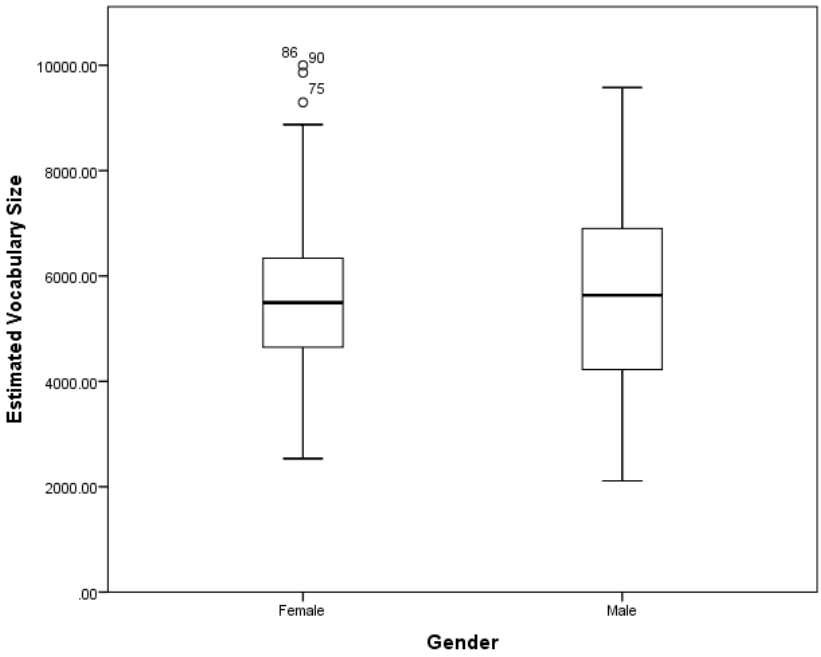

Figure 7: The Means and 95 Percent Confidence Intervals for Estimated Vocabulary Size by Gender

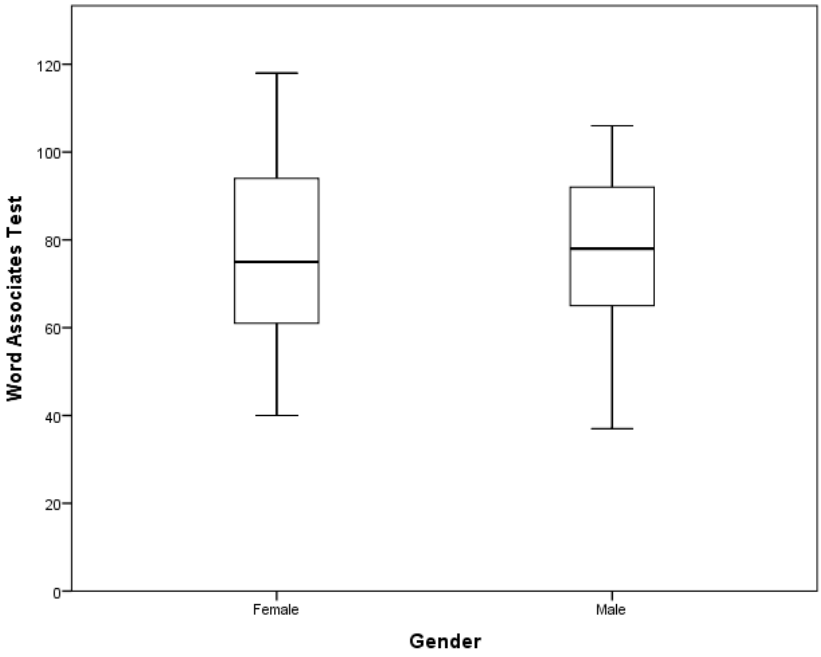

Figure 8: The Means and 95 Percent Confidence Intervals for *Word Associates Test* Scores by Gender

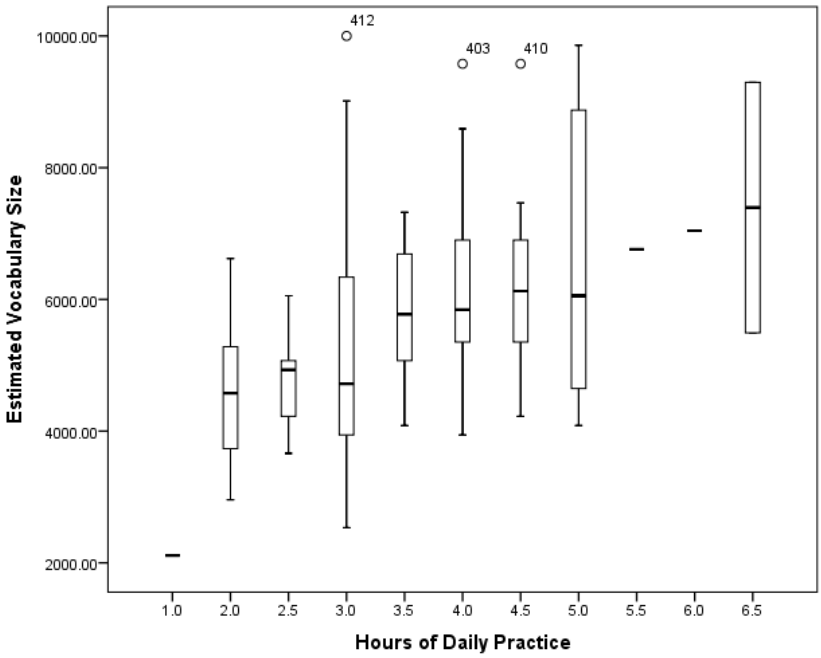

Figure 9: The Relationship of Vocabulary Size and Hours of Daily Practice

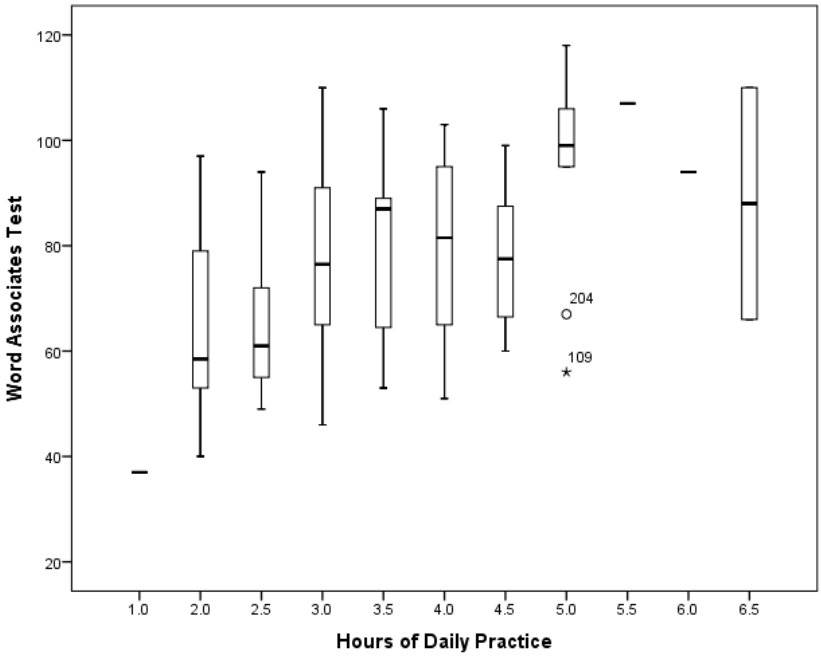

Figure 10: The Relationship of WAT Scores and Hours of Daily Practice

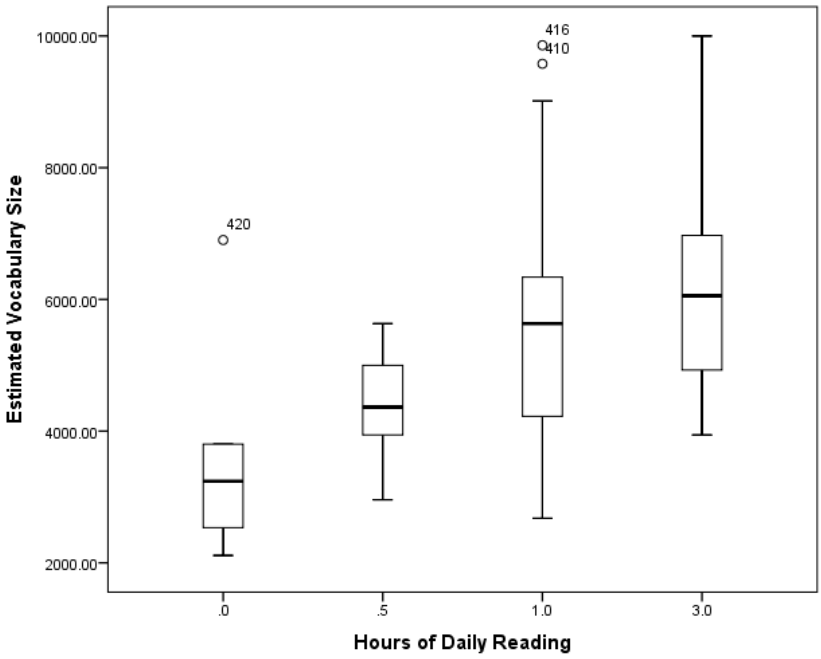

Figure 11: The Relationship of Vocabulary Size and Hours of Daily Reading

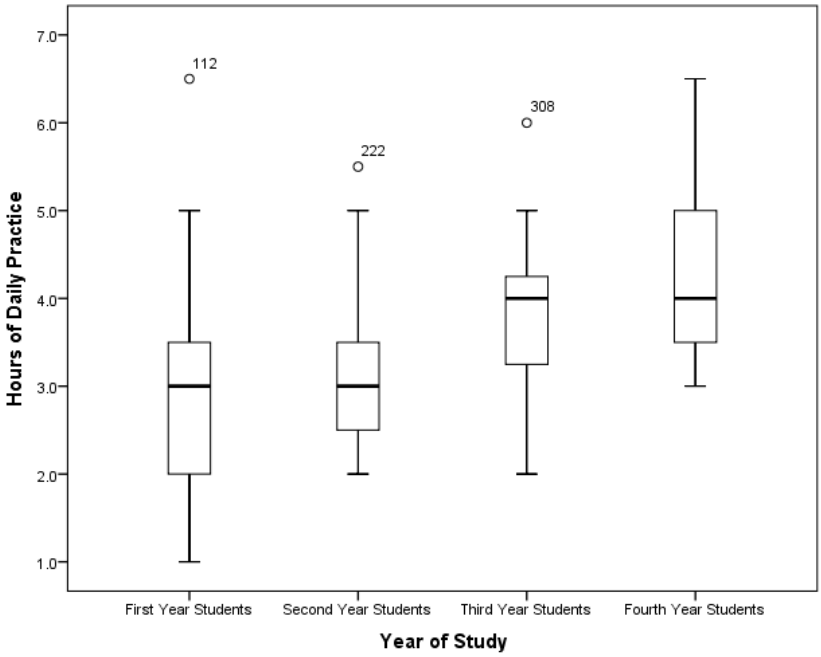

Figure 12: The Relationship of Hours of Daily Practice and Year of Study

CONCLUSION

Summary of the Study and the Findings

This study investigated the growth of vocabulary size and depth of word knowledge in Iraqi foreign language learners of English; the secondary purpose was to examine the influence of language learning variables on the lexical development of Iraqi learners of English.

The study was carried out at a university in Iraq. A cross-sectional method was followed to collect data on the English language learning of students who were studying to become teachers of English as a foreign language. A total of 120 participants volunteered, 30 from each of the four years of study, who were randomly selected to participate in the research by a local faculty member who served as a test administrator. The study instruments included two lexical tests, the *Self-Rated Vocabulary Test* and the *Word Associates Test*, as well as a questionnaire, which was designed to collect demographic and individual learner variables. All 120 volunteers completed the tests and the questionnaire; the test packets were sealed and forwarded to the researcher for scoring and analysis. To ensure the reliability of the self-reported measures, specific predetermined criteria were applied during the scoring; as a consequence, 25 testing packets were excluded from the analysis because they did not meet the benchmark of reliability. All analyses were carried out on the data provided by the remaining 95 participants whose responses met the threshold for reliability. Ten percent of the packets were scored by a second evaluator to ensure inter-scorer reliability.

Data were analyzed by using the Statistical Package for Social Sciences SPSS for Mac Version 23. The results indicated statistically significant differences by a large effect size for year of study for both English vocabulary size and for depth of word knowledge. Students grew their vocabulary by 800-1,000 words annually and improved significantly on the *Words Associates Test* overall from the first to the fourth year. While the growth of vocabulary size was steady and gradual, the development of depth of word knowledge seemed to occur in spurts. The role of daily practice was significant for both vocabulary size and for depth of word knowledge with apparent large differences for dosage of practice. Two-three hours of daily practice was noticeably less effective than 3-5 hours of daily practice. Daily reading showed a boost to vocabulary size, but it did not have a significant correlation with the WAT scores. Although the Iraqi foreign language learners displayed steady vocabulary growth and the resulting vocabulary size is adequate for oral communication in English as well as for reading general purpose texts, a larger vocabulary is necessary to comprehend radio programs and films, to sustain independent reading of texts, particularly English literature and informational texts beyond the middle school reading level. These findings are in line with other studies that investigated the vocabulary growth of EFL students at other universities internationally. The findings concur with previous research that the process of vocabulary learning requires integrating all language skills; language experiences from a variety of sources serve to contribute to depth of word knowledge.

Pedagogical Implications

According to the findings of this study, it was found that Iraqi pre-service teachers of English showed an average of 800 to 1,000 word increase in their vocabulary size after each year of study. As indicated earlier, the questionnaire responses informed us of the learners' methods of language learning and practice, such as using English-Arabic dictionaries and translation to learn new words English. Further, listening to recorded or live audio programs, watching programs or movies in English, and surfing English websites were not rated as active learning variables by the students. In addition, more than 90 percent of the students rated chatting and conversing in English with *less than one hour*. Therefore, several of implications based on these findings can be suggested for teachers and students to enhance the process of vocabulary and language learning.

First, since many students rely on English-Arabic dictionaries in learning the meaning of new words, teachers should urge students to use English-English dictionaries, which help students get better understanding of new words. Teachers can make students aware of the problems associated with bilingual dictionaries such as the different meanings that a word can carry in English. By using a monolingual dictionary, a learner can enhance both his/her vocabulary size and depth of word knowledge because this type of dictionary reduces the effect of first language interference. In addition, many of the new monolingual dictionaries provide the variety of definitions that a word can have with examples and can be installed on electronic devices.

Second, reading is one of the important skills in language learning, but to be more effective, it should be incorporated with other language skills. For the purpose of vocabulary learning, Laufer (2001) suggested that regarding reading as the primary

source of vocabulary acquisition is not necessary because teachers can integrate other word-focused activities such as sentence writing and fill-in tasks with reading to enhance vocabulary learning.

Finally, since the target language is limited to the classroom in most EFL contexts, students can practice many language learning activities outside the classroom. For example, students can devote a specific amount of time for conversing with other language learners from different parts of the world using the social media network. Students can also benefit from watching English movies and programs, watching videos for English language learning and practicing on websites, and listening to thousands of recordings that were created for learning English. These resources can have immense benefits for EFLs if they are purposively used. If English as a foreign language learners are actively employing different vocabulary learning strategies, they will accumulate a larger vocabulary and knowledge of each word they acquire.

Recommendations for Further Research and Study Limitations

The present cross-sectional study investigated the lexical development of Iraqi pre-service teachers of English over four years of instructions using the *Word Associates Test* and the *Self-Rated Vocabulary Test*. Further research can use the same instruments to investigate the lexical growth of graduate students who are studying in masters or doctoral programs of English in Iraq. These instruments can reveal important facts of the lexical outcomes of study if they are used with Iraqi graduate students because those students are considered highly successful learners of English. Additionally, results of highly successful learners of English in Iraq can be compared with native speakers'

results using previous research data, such as Hellman (2011). Finally, future research can also investigate the growth of vocabulary size and depth of word knowledge in a longitudinal study, which might reveal different findings about the lexical growth in Iraqi EFL students over four years of instruction.

One limitation in this study is that it followed a cross-sectional method of collecting data; therefore, we cannot be sure that the same findings would hold up with a longitudinal study, following the same group of students. A second limitation is that the vocabulary size test was a self-report instrument in which students rated their own knowledge; therefore, we have to question the degree of reliability of the self-report. Indeed, we did see that 21 percent of the responses were not reliable and had to be excluded from the analysis. A third and final limitation is that we tested the fourth year students at the start of the fourth year, so we do not actually know how they did at the end of the fourth year. Likely, at the time they graduate, they would have a vocabulary size that is larger by another 1,000 words.

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APPENDICES

Appendix A: Human Subjects IRB Approval

From: MSU IRB

Date: 9/24/2015

RE: Notice of IRB Exemption

Exemption Category: 1.Educational setting

Study #: 16-0064

Study Title: Investigating the Growth of Vocabulary Size and Depth of Word knowledge in Iraqi Foreign Language Learners of English

This submission has been reviewed by the Missouri State University IRB and was determined to be exempt from further review according to the regulatory category cited above under 45 CFR 46.101(b).

Investigator's Responsibilities:

If your study protocol changes in such a way that exempt status would no longer apply, you should contact the above IRB before making the changes.

Appendix B: Informed Consent

Project Title
Investigating the Growth of Vocabulary Size and Depth of Word knowledge in Iraqi Foreign Language Learners of English.

Description
The purpose of the study is to investigate the growth of vocabulary size and depth of word knowledge in Iraqi university students who are learning English as a foreign language. The proposal for this research has been reviewed by the Missouri State University Institutional Review Board.

Risks and Benefits
This project is highly unlikely to result in any risk or discomfort to you. Your participation will make a contribution to educational research about foreign language learning.

Voluntary Participation
Your participation in this study is voluntary.

Confidentiality
Please know that the researcher will be careful to maintain confidentiality in this study. The information you provide, including personal information and test results will be protected by the researcher. Neither the researcher nor the examination proctor will mention your participation in this study to anyone. Your name will not appear in any publication of the study. Data will be stored by the researcher and will be properly disposed after 3 years.

Right to Withdraw
Your participation in this study is voluntary, and you may withdraw your consent at any time. You may contact the Missouri State University supervising Dr. Andrea B. Hellman at 417-836-4846 or via email (AndreaBHellman@MissouriState.edu) with questions you may have regarding the study, the researcher, or your rights as a research participant. The researcher Akram Alfatle can be reached at 417-763-7762 or via email (Akram1985@live.missouristate.edu).

Informed Consent
I (please print),_____ , have read the description, including the purpose of the study, the procedures to be used, the potential risks and side effects, the confidentiality, as well as the option to withdraw from the study at any time. The investigators have explained each of these items to me. The investigators have answered all of my questions regarding the study, and I believe I understand what is involved. My signature below indicates that I freely agree to participate in this study and that I have received a copy of this agreement from the investigators.

_____ _____
(signature) (date)

Appendix C: Participants Questionnaire

Participant Code:

1. Gender: _____2. Age: _____
3. Province:_____4. Year of study: _____
5. Father's educational degree and current occupation: _____
6. Mother's educational degree and occupation: _____
7. Is Arabic your first language? Yes____ No____
If no, please indicate your first language here_____
Please choose an answer that best describes your typical daily activities:
8. How much time do you spend in a day watching English language TV programs or movies?

□ None □ Less than one hour □ 1-2 hours □ more than 3 hours

9. How much time do you spend in a day surfing English language websites?

□ None □ Less than one hour □ 1-2 hours □ more than 3 hours

10. How much time do you spend in a day listening to recorded or live audio programs in English?

□ None □ Less than one hour □ 1-2 hours □ more than 3 hours

11. How much time do you spend in a day listening to English language songs?

□ None □ Less than one hour □ 1-2 hours □ more than 3 hours

12. How much time do you spend in a day reading books in English for pleasure or for school?

□ None □ Less than one hour □ 1-2 hours □ more than 3 hours

13. How much time do you spend in a day texting or chatting online in English?

□ None □ Less than one hour □ 1-2 hours □ more than 3 hours

14. How much time do you spend in a day in face-to-face English language conversations?

□ None □ Less than one hour □ 1-2 hours □ more than 3 hours

15. What is the primary method you use to learn new words in English?

_____