

Relationship between Iranian Intermediate EFL Learners' Depth and Breadth of Lexical Knowledge and their Use of Cognitive and Metacognitive Vocabulary Learning Strategies

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Abstract

The present study set out to investigate the possible relationship between EFL learners' breadth and depth of L2 vocabulary knowledge and their use of cognitive and metacognitive vocabulary learning strategies. The participants of the study were 36 Iranian intermediate EFL learners who participated in the study from two language institutes based on random sampling. The data were collected using the Vocabulary Levels Test (VLT, Schmitt, Schmitt, & Clapham, 2001) and the Word Associates Test (WAT, Read, 1993, 2000, 2004) in order to respectively measure the participants' breadth and depth of vocabulary knowledge. The vocabulary learning strategies questionnaire (VLSQ, Schmitt, 1997) was also administered to the participants. The results of the study revealed that a) cognitive vocabulary learning strategies were used more frequently, b) both depth and breadth of vocabulary knowledge were strongly correlated with cognitive and metacognitive strategies use, c) metacognitive strategies were found to have a stronger correlation with the two dimensions of vocabulary knowledge (i.e. depth and breadth of vocabulary knowledge), d) the aggregate level of depth and breadth of vocabulary knowledge correlated positively and significantly with the aggregate level of cognitive and metacognitive strategies use. The present study highlighted the importance of metacognitive vocabulary learning strategies, which necessitates incorporating these strategies into EFL activities and programs.

Keywords: breadth of vocabulary knowledge, depth of vocabulary knowledge, cognitive strategy, metacognitive strategy

INTRODUCTION

Today, it is a commonly held belief that learning lexical items is of paramount importance in mastering a foreign language so that text comprehension/production process depends strongly on having a good command of vocabulary knowledge. As Vermeer (2001) notes, "after years of overvaluation of morphological and syntactic skills, knowledge of words is now considered the most important factor in language

proficiency and school success, in part due to its close ties with text comprehension” (p. 217). As such, vocabulary knowledge would be considered as a vital factor for second language learners as they need sufficient knowledge of the lexical items before they can comprehend what they have read or heard.

Several researchers (Qian, 2002; Read, 2000; Vermeer, 2001; Wolter, 2001 among many others) have considered *breadth* and *depth* of vocabulary knowledge as the main components of vocabulary knowledge. Although different definitions have been provided for these constructs (e.g., Nassaji, 2004; Qian, 2002; Zareva, 2005), *breadth* of vocabulary knowledge is here defined as the learner’s vocabulary size and is related to the quantity and frequency of use (Shen, 2009). *Depth* of vocabulary knowledge, on the other hand, characterizes the quality of vocabulary knowledge, implying that learners should have more than superficial understanding of the meaning of words. It covers such components as pronunciation, spelling, meaning, frequency, register, morphology, and syntactic and collocational properties (Qian, 2002).

A plethora of studies have reported the poor depth and breadth of vocabulary knowledge of EFL learners (e.g. Ma, 2009; Olmos, 2009; Zhang, 2001 among others), pointing out that most EFL students struggle to understand even the first 5,000 most frequent English words. As such, it is of paramount importance to discover which ways or strategies will best help learners learn, retain and retrieve vocabulary (Schmitt, 2000). In fact, many L2 learners have problems with obsolete strategies applied for the acquisition of vocabulary. For example, most EFL learners are taught with traditional approaches and strategies such as PPP approach (i.e. Present, Practice, Produce) for learning and retaining new lexical items. Consequently, language teachers should be aware of the effectiveness of different methods of vocabulary teaching to choose the ones that are most impressive to their students.

According to Ellis (2005), there are many processes involved in vocabulary learning/acquisition, but the different cognitive processes and conditions involved in language learners’ progression toward mastering vocabulary learning still remain as mystery. Also, cognitive researchers such as Dörnyei (2009) believe that certain cognitive processes in language learners’ minds make learning possible. As Vygotsky (1962) states, perhaps learning a foreign/second language is “conscious and deliberate from the start” (p. 46). Thus, it is essential to examine the cognitive dimension of lexical retrieval processes and issues related to vocabulary learning.

Marginalizing the role of the cognitive dimension, Pressley and Ghatala (1990) state that understanding the role of metacognitive awareness in language learning plays an important role in vocabulary learning. Coutinho (2007) argues that metacognition is a strong predictor of any kind of learning. Metacognition is defined as “knowledge about cognitive states and abilities that can be shared among individuals” (Paris & Winograd, 1990, p. 15). Simply put, metacognitive awareness is the knowledge of mental activities which require focusing on conscious knowledge about learning (Yore & Treagust, 2006). At the metacognitive level, as Wenden (2002) maintains, planning behavior, analyzing the situation language learners find themselves in, and evaluating their own

progress toward learning are things that learners do. Here, what is important for both L2 researchers and teachers is how metacognitive knowledge would affect the quality of vocabulary learning in the context of foreign/second language learning.

Although the theoretical significance of *cognitive* and *metacognitive* awareness has been well-documented in L2 research literature (e.g. DeKeyser, 2007; Ellis, 2005; Ellis et al., 2009), as DeKeyser (2003) and Ellis (2009) point out, few empirical studies have been conducted to investigate the relationship between these two types of vocabulary learning strategies and L2 learners' depth and breadth of vocabulary knowledge. Besides, as Vermeer (2001) states, the relationship between breadth and depth of word knowledge is still not well-understood, and there might not be a conceptual distinction between the two dimensions. In a similar vein, Milton (2009) asserts that providing a clear, comprehensive, and unambiguous definition of the concept of vocabulary knowledge requires more research on vocabulary acquisition to generate more rigorous data and shed more light on this area. Accordingly, the present study will examine (i) if Iranian intermediate EFL learners used cognitive or metacognitive vocabulary learning strategies more, (ii) if there is a significant relationship among EFL learner's breadth of vocabulary knowledge, depth of vocabulary knowledge, cognitive strategy use, and metacognitive strategy use, and (iii) if the aggregate level of the depth and breadth of vocabulary knowledge of intermediate EFL learners is significantly correlated with the aggregate level of the use of cognitive and metacognitive vocabulary learning strategies. The body of the text (Normal Style) should be in Cambria 12, line space 1.15, spacing before is 0pt, spacing after is 10pt. There is no indentation for the first line of a paragraph.

LITERATURE REVIEW

Breadth and depth of vocabulary knowledge

During the last two decades, vocabulary has been regarded as a crucial element of language proficiency, both in first and second language acquisition (Ouellette, 2006). Due to its role in learning other language skills, vocabulary knowledge is now considered to be of paramount priority in second/foreign language proficiency and success without which understanding sentences or texts is deemed impossible (Bernhardt, 2005). But what does actually the term "vocabulary knowledge" mean?

The complexity of vocabulary knowledge makes it difficult to reach an agreed-upon opinion about what is involved in word knowledge. Based on several studies, it has been realized that vocabulary knowledge is multidimensional and includes several types of knowledge (Nation, 2001). Richards (1976) makes several assumptions on vocabulary knowledge including knowledge of word meanings, semantics, usage, constraints, its morphology, associations, and contextual meaning. Chapelle (1998) argues that an appropriate definition of vocabulary should include four dimensions: (1) vocabulary size; (2) knowledge of word characteristics; (3) lexical organization; and (4) process of lexical access. Along the same line, Henriksen (1999) suggests that lexical competence should contain three dimensions (i) precision of knowledge, (ii) depth of knowledge,

and (iii) receptive and productive knowledge. Finally, based on the collective strength of former models of vocabulary knowledge, Qian (2002) proposed a conceptual framework, which offers four interconnected dimensions of vocabulary knowledge:

(i) *vocabulary size*, which refers to the number of words of which a learner has at least some superficial knowledge of meaning;

(ii) *depth of vocabulary knowledge*, which comprises all characteristics of lexical items such as phonemic, graphemic, morphemic, syntactic, semantic, phraseological and collocational properties as well as register and frequency;

(iii) *lexical organization*, which concerns the storage, connection, and representation of vocabulary items in a learner's mental lexicon; and

(iv) *automaticity of receptive-productive knowledge*, which pertains to all essential processes used to access the word knowledge for both productive and receptive purposes, including orthographic and phonological encoding and decoding, lexical-semantic integration and representation, access to grammatical and semantic features from the mental lexicon, and morphological composing and parsing.

In addition to the complexity of specifying the components of vocabulary knowledge, it is also difficult to reach a consensus on how to measure the vocabulary knowledge. In order to assess size and depth of vocabulary knowledge different types of assessment tools with various formats have been proposed. These tests, as Nassaji (2004) states, "require the learner to identify a synonym for a word in a multiple-choice test, match words with definitions, translate a word into L1, or use checklists" (p. 389). The major problem in determining vocabulary size is to decide on the size of the sample to be taken. Clearly, there is a positive relation between the number of words that are tested and the accuracy of the estimate, but this has to be balanced against the practicalities of carrying out the test (Read, 1993). This problem has been resolved in the Vocabulary Levels Test (VLT) proposed by Schmitt, Schmitt, and Clapham (2001). Thereby the sample size has been reduced by testing learners' knowledge of vocabulary at several frequency levels. In this test, learners are provided with groups of six words, three of which must be matched to their definitions. The VLT includes five sections, each of which represents a different vocabulary level in English, ranging from high-frequency to low-frequency words. The main purpose of this test is to examine whether high-frequency words are learned, and also to determine to what extent the learning of low-frequency words has occurred. Despite the absence of context in the test, it has been shown to accurately gauge learners' vocabulary knowledge (Laufer, 1998), and is now used for placement purposes (Read, 2004).

On the other hand, the depth of vocabulary knowledge is frequently measured by Word Associates Test (WAT), which was developed by Read (1993, 2000, 2004). As Nassaji (2004) claims, vocabulary knowledge is actually considered as the knowledge of word with its spelling, pronunciation, register, and morphological and stylistic features as well as the word's semantic and syntactic relationships with other words in the language, including collocational meanings and knowledge of synonymy, antonymy, and

hyponymy. As Read (2004) states, the target words and their associates on WAT are “paradigmatic (super-ordinates, synonyms), syntagmatic (collocates) and analytic (words representing a key element of the meaning of the target word)” (p. 221). It should be pointed out that like any other language learning measures, there is not a consensus on the efficiency and applicability of the depth of vocabulary measures. As Milton (2009) asserts, regarding depth of vocabulary measures, there is “no clear, comprehensive and unambiguous definitions to work with” (p. 150).

Vocabulary learning strategies

Vocabulary learning strategies, as a subcategory of language learning strategies, has been the subject of considerable controversy within second language acquisition literature (Nation, 2001). Cameron (2001) considers vocabulary learning strategies as “the actions that learners take to help themselves understand and remember vocabulary items” (p. 92). Intaraprasert (2004, p. 53) defines the term ‘vocabulary learning strategies’ as “any set of techniques or learning behaviors that language learners use in order to discover the meaning of a new word, to retain the knowledge of newly-learned words and to expand their knowledge of vocabulary”.

According to Schmitt (2000), the movement to a more learner-centered approach toward second language learning, which brings about autonomy, makes learners inclined to use second language vocabulary learning strategies. Studies show that adults are able to actively engage in their own vocabulary learning, even more than with other language skills such as reading, writing, speaking, listening, and grammar (Schmitt, 2000). Due to the relatively discrete nature of vocabulary learning, it is more amenable to learning strategies in comparison with other language components and skills.

Numerous researchers have proposed different ways of classifying vocabulary learning strategies. For instance, Gu and Johnson (1996), Schmitt (1997), Decarrico (2001) and Hedge (2000) have developed a taxonomy of vocabulary learning strategies based on the language learning strategy taxonomy created by Oxford (1990), Stoffer (1995), and Rubin and Thompson (1994) respectively. From a general language learning perspective, Oxford (1990) has identified two main categories of strategies: *direct strategies*, which include memory and cognitive strategies, and *indirect strategies*, which include metacognitive and social strategies.

Gu and Johnson (1996) offered a taxonomy of vocabulary learning strategies and categorized them into four groups: *metacognitive*, *cognitive*, *memory* and *activation strategies*. From among them, cognitive and metacognitive strategies have gained more attention during the last two decades. *Metacognitive strategies* include *selective attention* and *self-initiation* strategies. *Selective attention* strategies are those which determine important words for learners to learn and are indispensable for comprehension of a passage. *Self-initiation strategies* are the ones used by learners when they find a vocabulary personally relevant and useful. *Cognitive strategies* consist of dictionary use, note-taking and guessing strategies (Gu & Johnson, 1996). *Memory*

strategies include rehearsal and encoding strategies. *Activation strategies* are those which learners employ to deliberately use newly studied words in various contexts.

Drawing on several vocabulary reference books and a study with Japanese students, Schmitt (1997) proposed a detailed inventory including 58 vocabulary learning strategies. He then divided them into two major categories: *consolidation strategies* and *discovery strategies*. The first major category, known as consolidation strategies, was based on Oxford (1990), who classified learning strategies into four types:

- *social*: using interaction with other interlocutors to improve the learning process;
- *memory*: connecting new learning material to previous knowledge;
- *cognitive*: “manipulation and transformation of the target language by the learner” (Schmitt, 1997, p. 205);
- *metacognitive*: being aware of, planning, monitoring and evaluating the learning process.

Schmitt, however, later added a fifth type of strategies, *determination strategies*. He intended to include major lexically-focused strategies, such as the strategies learners use when they encountered new words without any additional help. The second major category of strategies, adopted from Nation (1990), is known as *discovery strategies*, which learners use when they come across new words. Accordingly, Schmitt (1997) classified strategies into *social, memory, cognitive, and metacognitive, and determination strategies*. However, for the purpose of this study, only *cognitive* and *metacognitive* strategies will be investigated. Cognitive strategies pertain to the mechanical aspects of second language vocabulary learning (Nation, 2001), which could be assigned as parts of a course or homework by the teacher. According to Schmitt (1997), cognitive vocabulary learning strategies fall into four subcategories – i.e., *cognitive practice strategies, cognitive creative strategies, cognitive overcoming strategies, and cognitive analyzing and reasoning/translation strategies*.

As one of the most important *cognitive practice strategies* employed by L2 learners, using vocabulary notebooks is regarded as an efficient way of increasing learner autonomy. In this way, learners could choose the vocabulary items that they will take note of, so the notebooks improve their self-awareness and greatly decrease the teacher’s role in part of the learning process. In fact, learners take the responsibility for selecting new vocabulary to boost their sense of discovery (Schmitt & Schmitt, 1995). After Fowle (2002) introduced vocabulary notebooks to a school in Thailand, a significant increase in learners’ cognitive knowledge in the form of “appropriacy of strategy selection, a better understanding of the demands of vocabulary learning, and a greater tolerance of ambiguity” was found (p. 385).

Another cognitive strategy that was frequently used by learners in Schmitt’s (1997) survey of learning strategies was *repetition*. Second language learners most often repeat the words either orally (i.e. verbal repetition) or in written form (i.e. written repetition) for the sake of improving their vocabulary knowledge, but the depth of processing

obtained through using this strategy was barely enough to enable learners to use the limited amount of the obtained knowledge for communicative use. Nevertheless, learners have traditionally capitalized on rote learning (i.e. *repetition*) to reach high levels of proficiency (Nation, 2001; Read, 2004). There are other examples of cognitive strategies, including *using flash cards, using word lists, using the vocabulary section in the textbooks, listening to tape of word lists, putting English labels on physical objects, and keeping a vocabulary notebook* (Schmitt, 1997). These strategies exemplify the four sub-categories of cognitive vocabulary learning strategies, and could all assist noticing. Once an item is brought into conscious attention, so the process of acquiring that item begins (Schmidt, 1990).

In addition to cognitive vocabulary learning strategies, learners use *metacognitive* vocabulary learning strategies by developing an awareness of their own learning procedures and how they could improve their learning most efficiently. In fact, many of the processes employed by efficient learners could be classified as metacognitive strategies, since they are reflections of learners' ability to take advantage of opportunities to record and review the learning experiences. Once learners encounter new vocabulary items in reading and listening materials, they must adopt appropriate strategies to record and review them in an organized way so that learning would not become haphazard and sporadic. Learners should also decide which words they should notice mostly, since they usually have a limited amount of time available for learning, and should skip infrequent or technical vocabulary in order to improve their efficiency. Examples of metacognitive strategies are *using English-language media (songs, movies, newspaper, etc.), testing oneself with word tests, using spaced word practice, skipping or passing new word, and continuing to study word over time* (Schmitt, 1997). In the present study, two subcategories of metacognitive vocabulary learning strategies are considered; i.e., *metacognitive centering and planning* and *metacognitive evaluation and monitoring*.

Some studies in the literature have investigated the frequency of the use of different vocabulary learning strategies (e.g. Fan, 2003; Kudo, 1999; Wu, 2005), and some others have examined that the relationship between vocabulary learning strategy use and learners' vocabulary size and proficiency (e.g., Ahmed, 1989; Barcroft, 2009; Fan, 2003; Gu & Johnson, 1996). Alavi and Kaivanpanah (2006), for example, examined the relationship between cognitive and metacognitive vocabulary learning strategies used by TEFL and non-TEFL undergraduate students and their fields of study. The results of their study revealed that both TEFL and non-TEFL participants employed cognitive strategies more than metacognitive strategies. It was also found that students' choice of vocabulary learning strategies was highly correlated by their majors.

While the studies mentioned in the literature have conducted ample research about L2 learners' cognitive and metacognitive strategy use and their importance in language proficiency, the relationship between the breadth and depth of vocabulary knowledge and (meta)cognitive strategy use has been understudied. This is where the present

study departs from the studies conducted in the literature. Therefore, the present study sought to answer the following research questions:

1. Is there a significant difference between the level of the use of cognitive and metacognitive vocabulary learning strategies by Iranian intermediate EFL learners?
2. Is the depth of vocabulary knowledge of Iranian intermediate EFL learners correlated with the level of the use of their cognitive vocabulary learning strategies?
3. Is the breadth of vocabulary knowledge of Iranian intermediate EFL learners correlated with the level of the use of their cognitive vocabulary learning strategies?
4. Is the depth of vocabulary knowledge of Iranian intermediate EFL learners correlated with the level of the use of their metacognitive vocabulary learning strategies?
5. Is the breadth of vocabulary knowledge of Iranian intermediate EFL learners correlated with the level of the use of their metacognitive vocabulary learning strategies?
6. Is the aggregate level of the depth and breadth of vocabulary knowledge of Iranian intermediate EFL learners significantly correlated with the aggregate level of the use of cognitive and metacognitive vocabulary learning strategies?

Method

Participants

An initial cohort of 175 Iranian EFL learners studying English at two language schools in Shahrekord, Iran, participated in the study. They were all aged between 15 and 24. The Oxford Quick Placement Test (QPT) was administered to them in order to select a homogeneous sample consisting of participants who were at the intermediate level of language proficiency. After obtaining the scores of the QPT, a sample of 36 intermediate EFL learners, whose scores fell between 30 and 39, was randomly selected and considered as the final participants of the study. The sample comprised of 15 male and 21 female students, who were all native speakers of Persian.

Instruments

The present study employed the following instruments for the data collection process:

Oxford Quick Placement Test (QPT)

To make sure that all participants in the study enjoyed the intermediate level of language proficiency, version 1 of the Oxford Quick Placement Test (QPT) was used. The participants were required to finish this 60-item test in 30 minutes.

Vocabulary Levels Test (VLT)

The first vocabulary test used in this study was a validated version of the Vocabulary Levels Test (VLT) (Schmitt, Schmitt, & Clapham, 2001) employed to measure the breadth of vocabulary knowledge. This vocabulary test has versions 1 and 2. These two versions are of the same level of difficulty (Schmitt et al., 2001). In this study, version 2 was employed because it is based on the new Academic Word List (AWL). This version has five word levels, ranging from high-frequency to low-frequency words (i.e., 2,000-word level, 3,000-word level, 5,000-word level, 10,000-word level, and academic vocabulary level).

Vocabulary Levels Test (VLT) can estimate the participants' basic knowledge of common word meanings at different word levels. The test format contains matching words and word meanings. For example:

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

The participants are required to match the three short definitions on the right with three of the six words on the left. As for the scoring procedure, each correctly chosen word is awarded one point. Since there are 5 levels, and each level includes 30 correct choices, the maximum score is 150. However, due to the difficulty of low-frequency words for the intermediate EFL participants of the present study, the 10,000-word level and academic vocabulary level were excluded from the test. A careful look at the related literature also shows that the 10,000 word level is deemed appropriate for those who have near native-like proficiency and is seldom used in EFL contexts (e.g., Kassaian & Esmae'li, 2011; Laufer & Ravenhorst-Kalovski, 2010). Therefore, the vocabulary items included in the first three levels (i.e., 2,000-word level, 3,000-word level, 5,000-word level) were used in this study; hence the maximum possible score was 90.

Word Associates Test (WAT)

The second vocabulary test was the Word Associates Test (WAT) (Read, 1993, 2000, 2004), which measured the depth of L2 learners' vocabulary knowledge. This test is a 40-item multiple-choice test, with a reliability of .93 already reported in the literature (Read, 2000, 2004). The target word and its associates on WAT, as Read (2004) states, are "paradigmatic (super-ordinates, synonyms), syntagmatic (collocates) and analytic (words representing a key element of the meaning of the target word)" (p. 221). This test has been used in previous studies on exploring L2 learners' depth of vocabulary knowledge (e.g. Nassaji, 2004; Qian, 2002; Teng, 2014). The fourth version of this test was used in the study to measure the learners' ability in identifying the collocational,

synonymous, part-whole, or whole-part relationship between a stimulus word (adjective) and eight options.

Vocabulary Learning Strategies Questionnaire (VLSQ)

In order to investigate the participants' strategy use, Schmitt's vocabulary learning strategies questionnaire (VLSQ, Schmitt, 1997) was adapted to the purpose of the present study. This questionnaire uses a 5-point Likert scale, with options ranging from 'never' to 'always'. Based on Schmitt's (1997) taxonomy, the questionnaire items are classified into five categories: *Determination, Social, Memory, Cognitive, and Metacognitive* strategies. There are 56 strategies in 6 categories in this taxonomy. However, for the purpose of this study, only the statements related to the *cognitive* (N=20) and *metacognitive* (N=13) categories were used, which overall comprised a 33-item questionnaire. Table 1 indicates the subcategories related to cognitive and metacognitive categories of vocabulary learning strategies which were used in the present study.

Table 1. Cognitive and Metacognitive Categories of Vocabulary Learning Strategies Questionnaire

Categories	Subcategories
Cognitive	Overcoming
	Creative Practice
	Analyzing and reasoning/translation
Metacognitive	Evaluating and monitoring
	Centering and planning

Care was taken at this point to prepare the questionnaire in the students' mother language (i.e. Persian) to remove the likelihood of misunderstanding. To eliminate anxiety and stress, sufficient amount of time was allocated for taking the test in order to remove a likely adverse effect on the preciseness of the responses. The reliability of the questionnaire, calculated by the Cronbach's alpha, turned out to be 0.92. The validity of the questionnaire was established by piloting the questionnaire and using the opinions of two specialists in the field of TEFL.

Procedures

The data collection process was accomplished in three sessions. In the first session, all 175 participants of the study took the Oxford Quick Placement Test (QPT). In the second session, the two vocabulary tests (i.e. Vocabulary Levels Test (VLT) and Word Associates Test (WAT)) were administered to the 36 intermediate-level learners who were selected as the final participants of the study. In the third session, the vocabulary learning strategies questionnaire (VLSQ) was administered. It was a researcher-developed questionnaire adopted from Schmitt's vocabulary learning strategies questionnaire (Schmitt, 1997). The 33-item questionnaire was designed specifically for the purpose of this study so that only cognitive and metacognitive components of Schmitt's vocabulary learning strategies were included.

The procedure for the data analysis was as follows. First, the participants' QPT scores were obtained and intermediate-level students were selected from among the population. Then, the participants' scores on the two vocabulary tests (i.e. VLT and WAT) as well as the score of the VLSQ were analyzed. Descriptive statistics was applied so as to recognize the most and least frequent vocabulary learning strategy categories used by the participants. A paired-samples *t*-test was used to calculate the difference between the frequency of the use of cognitive and metacognitive vocabulary learning strategies. A set of Pearson product-moment coefficient of correlations were also used to explore the possible relationship between learners' depth of vocabulary knowledge, breadth of vocabulary knowledge, their use of cognitive vocabulary learning strategies, and their use of metacognitive vocabulary learning strategies. The correlation between the aggregate level of the learners' depth and breadth of vocabulary knowledge and the aggregate level of their use of cognitive and metacognitive vocabulary learning strategies was also calculated by a Pearson correlation test.

RESULTS

Results of the first research question

The first research question explored if there was a significant difference between the level of the use of cognitive and metacognitive vocabulary learning strategies by the intermediate EFL learners. The relevant descriptive statistics are given in Table 2 below:

Table 2. Mean Scores for Subcategories of Cognitive and Metacognitive Vocabulary Learning Strategies

		Mean (N=36)	SD
Cognitive strategies	Overcoming	67.70	4.34
	Creative	62.37	4.74
	Practice	56.94	4.79
	Analyzing and reasoning/translation	40.62	3.82
\bar{X}		56.90	4.18
Metacognitive strategies	Evaluation and monitoring	34.56	4.01
	Centering and planning	33.73	3.44
\bar{X}		34.14	3.64

Table 2 presents the means and SDs of the (sub)categories of cognitive and metacognitive vocabulary learning strategies of Vocabulary Learning Strategy Questionnaire (VLSQ). It can be clearly seen that, on average, the participants preferred to use cognitive strategies ($\bar{X} = 56.90$) more than metacognitive ones ($\bar{X} = 34.14$). The next step was to apply a paired-samples *t*-test to analyze whether there was a statistically significant difference between cognitive and metacognitive vocabulary learning strategies used by the participants of the study. The results are shown in Table 3 in the following:

Table 3. Paired-Samples T-test for Comparing the Difference between Cognitive and Metacognitive Strategies Use

	Paired Differences						t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference					
				Lower	Upper				
Cognitive-Metacognitive	22.76	3.36	1.56	.79	1.07	3.87	35	.00	

The results confirm that there was a statistically significant difference in the use of cognitive and metacognitive vocabulary learning strategies by the participants of the study ($p < 0.05$). The comparison of the mean scores for the strategies showed that cognitive vocabulary learning strategies were used more frequently than metacognitive strategies. In other words, the learners used more vocabulary learning strategies that were related to remembering and retrieving new information, understanding and producing the words, and compensation strategies for overcoming limitations in their language knowledge.

Results of the second research question

The second research question investigated if the depth of vocabulary knowledge of the intermediate EFL learners is significantly correlated with the level of their use of cognitive vocabulary learning strategies. In order to calculate the correlation between cognitive strategies and depth of vocabulary knowledge, the Pearson product-moment correlation coefficient was used. The result is presented in Table 4 below:

Table 4. Correlation between Vocabulary Depth and Cognitive Strategies

Variables	Cognitive strategies	
	The correlation coefficient	Sig.
Vocabulary depth	.512	.001

Based on Cohen's (1988) guideline for the interpretation of correlation coefficient in which correlations above .50 are large, it can be seen that the learners' use of cognitive strategies was significantly correlated with their depth of vocabulary ($r = .51, p < 0.05$).

Results of the third research question

The third research question investigated if the breadth of vocabulary knowledge of the intermediate EFL learners correlated with the level of their use of cognitive vocabulary learning strategies. Table 5 presents the results:

Table 5. Correlation between Vocabulary Breadth and Cognitive Strategies

Variables	Cognitive strategies	
	The correlation coefficient	Sig.
Vocabulary breadth	0.487	0.003

With regard to the correlation between the breadth of vocabulary knowledge and cognitive strategies, the results suggest that learners' larger vocabulary knowledge had medium correlation with their use of cognitive vocabulary learning strategies ($r = .49$, $p < 0.05$).

Results of the fourth research question

The fourth research question examined whether the depth of vocabulary knowledge of the intermediate EFL learners correlated with the level of their use of metacognitive vocabulary learning strategies. The result is given in Table 6:

Table 6. Correlation between Vocabulary Depth and Metacognitive Strategies

Variables	Metacognitive strategies	
	The correlation coefficient	Sig.
Vocabulary depth	0.684	0.00

As shown in Table 6, there was a positive correlation of .68 between the scores on the depth of vocabulary knowledge and metacognitive strategies use ($p < 0.05$). This shows that the depth of vocabulary knowledge increases as the use of metacognitive vocabulary learning strategies increases.

Results of the fifth research question

The fifth research question addressed if the breadth of vocabulary knowledge of the intermediate EFL learners correlated with the level of their use of metacognitive vocabulary learning strategies. The relevant result is given in Table 7:

Table 7. Correlation between the Vocabulary Breadth and Metacognitive Strategies

Variables	Metacognitive strategies	
	The correlation coefficient	Sig.
Vocabulary breadth	0.642	0.00

As represented in Table 7, there was a strong positive correlation between the breadth of vocabulary knowledge and metacognitive strategy use of L2 learners ($r = .642$, $p < 0.05$). This shows that not only the depth but also the breadth of vocabulary knowledge improves as the use of metacognitive strategies increases.

Results of the sixth research question

The last research question investigated if the aggregate level of the depth and breadth of vocabulary knowledge of Iranian intermediate EFL learners significantly correlated with the aggregate level of their use of cognitive and metacognitive vocabulary learning strategies. The result is presented in Table 8:

Table 8. Correlation between the Aggregate Level of Vocabulary Learning Strategies and the Aggregate Level of Vocabulary Knowledge

Variables	Aggregate level of cognitive and metacognitive vocabulary learning strategies	
	The correlation coefficient	Sig.
Aggregate level of vocabulary knowledge	.697	0.00

As illustrated in Table 8, there was a significantly high correlation between the aggregate level of the depth and breadth of vocabulary knowledge and the aggregate level of cognitive and metacognitive vocabulary learning strategies ($r = 0.70$, $p < 0.05$).

DISCUSSION AND CONCLUSIONS

The present study was an attempt to identify the most frequently used vocabulary learning strategies and to examine the relationship between breadth and depth of Iranian intermediate EFL learners' vocabulary knowledge and the level of their use of cognitive and metacognitive vocabulary learning strategies. The findings suggested that the Iranian intermediate EFL students used the cognitive strategies of *overcoming*, *creating structure*, and *practicing* more frequently than other strategies. On the other hand, the metacognitive strategies of *evaluation and monitoring* and *centering and planning* were the least frequently used strategies. Therefore, Iranian EFL learners tended to use cognitive vocabulary learning strategies more frequently than metacognitive strategies. This finding is consistent with that of Alavi and Kaivanpanah (2006), who concluded that Iranian EFL learners used cognitive vocabulary learning strategies more frequently. This was expected because cognitive strategies are inherently involved in vocabulary learning. Since the participants in this study were intermediate EFL learners, it can be argued that they focused on those strategies that were more relevant to their needs. In other words, due to their relative command of language, participants focused more on vocabulary learning strategies that involved them cognitively in the process of learning the meaning of the word.

The results of the second research question indicated that the EFL learners' depth of vocabulary knowledge was significantly correlated with their cognitive vocabulary learning strategy use ($r = .51$, $p < .05$). This implies that the more EFL learners use cognitive vocabulary learning strategies, the deeper their knowledge of words become. In connection to the relationship between the breadth of vocabulary knowledge and cognitive vocabulary learning strategy use, the results of the third research question revealed that there was a medium correlation ($r = .49$, $p < .05$), suggesting that learners'

vocabulary knowledge is relatively expanded as L2 learners use cognitive vocabulary learning strategies.

As evinced by the results of the fourth and fifth research questions, metacognitive vocabulary learning strategies have strong correlations with both depth and breadth of vocabulary knowledge. Comparing the results of the second and fourth research questions, one can conclude that depth of vocabulary knowledge has a stronger relation with metacognitive strategies ($r = .68$, $p < .05$) rather than cognitive strategies ($r = .51$, $p < .05$). The results also suggested that the use of metacognitive vocabulary learning strategies had a slightly higher correlation with the depth of vocabulary knowledge ($r = .68$) rather than with the breadth of vocabulary knowledge ($r = .64$).

Based on the results of the sixth research question, the relationship between the aggregate level of depth and breadth of vocabulary knowledge with the aggregate level of cognitive and metacognitive strategies was found to be significant, implying that the more the L2 learners employed cognitive and metacognitive strategies, the more they learned new words and the deeper they learned the words. There is enough evidence that learners with higher scores on the vocabulary tests are more prone to use more cognitive and metacognitive vocabulary learning strategies. This finding is in line with many previous research results suggesting that L2 learners with higher proficiency levels use more strategies (Fowle, 2002; Schmitt, 1997).

In light of the findings of the current study, teachers should encourage students and raise their awareness to use L2 vocabulary learning strategies more frequently. These include not only the frequently used cognitive strategies, but also the metacognitive strategies that they seldom use. It is also suggested that making learners informed of the importance of metacognitive strategies might help them improve their vocabulary learning as well as their English proficiency. In this regard, teachers and syllabus designers should integrate intervention training on metacognitive strategies into L2 learners' English lessons to improve the learners' vocabulary knowledge and in turn their proficiency level. Focusing on metacognitive strategies helps L2 learners have more control on their learning processes, and as a result helps shift the burdensome role from teachers to learners. In this way, the teacher's main job is to plan lessons and teach vocabulary learning strategies to students, while the student's main job is to take responsibility for their own learning.

One thing that must be noted is that the development from breadth of lexical knowledge to depth of lexical knowledge is a gradual process. This could be due to the fact that cognitive strategies of *creating structures for input and output* are insufficient for increasing the depth of lexical knowledge. Teachers should, therefore, encourage L2 learners to employ metacognitive strategies (i.e., self-planning, self-monitoring, and self-evaluating) in order to regulate or manage their own learning and develop autonomy as a result.

Future lines of research could include but not be limited to: (1) investigating the relationship among cognitive and metacognitive vocabulary learning strategies and the

depth and breadth of lexical knowledge in elementary and advanced L2 learners and comparing the results of different proficiency levels, (ii) including more participants from different L2 settings in order to have results with stronger generalisability power, (iii) using measures of the depth and breadth of vocabulary knowledge other than the ones used in this study, (iv) and teaching cognitive and metacognitive strategies and comparing their effects on the breadth and depth of L2 learners' lexical knowledge.

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