

Investigation of Vocabulary Learning Strategies to Identify Word Meanings for Saudi EFL Students in Reading Context

Mohammed Abdulmalik Ali

Department of English

College of Science and Humanities, Prince Sattam bin Abdulaziz
University, Al Kharj, Saudi Arabia

Abstract

This study attempted to answer the following research questions related to the various vocabulary discovery strategies which are used by Saudi undergraduate learners to find unknown word meanings, the most and the least vocabulary discovery strategies the learners used to discover unknown word meanings, the relationship between the type of Vocabulary Learning Strategies used and the scores the learners accomplished on the vocabulary test, and effectiveness of the learner control and the teacher control strategy in enhancing learners' ability to discover meanings of unknown words. Answering these questions of the study are expected to help language instructors determine the most feasible vocabulary learning strategies to help their students improve their vocabulary and so their language competences. Through purposive sampling, a group of 50 male students participated in this descriptive and analytic type of study. A questionnaire and a vocabulary test were used to collect data. The findings of the study revealed that in understanding a reading text, EFL Saudi students tend to figure out the meanings of unknown words, mainly by guessing word-meanings through different sub-strategies. The least used was the social interaction strategy. It was also found that students' scores on the vocabulary test significantly correlated (positively and negatively) with the type of strategy they used. This study concluded that it is vital for teachers and textbook writers to design more activities to train students on the use of effective vocabulary learning strategies, mainly guessing through socially linked contextual clues.

Keywords: English vocabulary learning, Saudi EFL learners, vocabulary learning strategies, language learning, language acquisition

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Introduction

When learners acquire the knowledge of the lexicon of a language, they attain language proficiency (Schmitt, 2008) since vocabulary learning is not only acquiring word meanings and their connotations, their derivatives, and collocations, but also gaining communicative competence along with grammar and skills (Fan, 2003; Griffiths, 2003; Nyikos and Fan, 2007; Nation 1990). There was no dearth of pioneering studies in vocabulary learning strategies (VLS) in 1980s (Dempster, 1987; Ahmed, 1989; Jenkins, Matlock & Slocum, 1984). However, in 1990s and 2000s VLS grew multi-dimensionally to gain new insights (Lin, 2014; Godwin-Jones, 2018b; Nyikos & Fan, 2007; Gu, 2010; Moir & Nation 2002; Elgort, Candry, Boutorwick, Eyckmans, & Brysbaert, 2016). These studies laid foundations of several classifications of VLSs, e.g., individual words in L2 juxtaposed with their equivalent L1 words or learning vocabulary through multiword units conveying different meanings and so on. A recent study on portmanteaus (Ali & Ilyas, 2020) as specific word items revealed a paradigm shift in making use of portmanteaus as discourse markers.

Elgort et al. (2017) consider vocabulary learning, first as recognition of a word at the receptive level; then, using the word at the productive level in different contexts through its derivatives. Interestingly, Nyikos and Fan (2007) observed three important aspects of vocabulary acquisition, irrespective of categories, or learning strategies adopted by learners. According to them, vocabulary learning depends upon (1) the time required to store words in memory beyond rote learning, the stronger mnemonic power that a learner possesses, the greater is his/her vocabulary learning; (2) awareness of the linguistic features of words, and (3) the context of the target vocabulary.

Though several VLSs so far have been studied and implemented in different contexts, no attempt has been made to identify specific strategies to learn meanings of unknown words as it is examined in the current study which concentrates on the determination level. To process this determination level effectively, Saudi learners of EFL should possess the knowledge and skill needed to discover meanings of unknown words as they occur in different contexts. A need is therefore felt to first examine the existing list of strategies the students implement, (Ahmed, 1989; Gu & Johnson, 1996; Schmitt, 1997; Nation, 2001) and to identify whether any of these strategies fits the requirements of learning such unfamiliar words in Saudi EFL situation.

To examine the VLSs, it is important to understand their relationships with various taxonomies. For example, Schmitt's (1997) taxonomy which is an adaptation from Oxford's (1990) taxonomy of LLS, is widely recommended, focusses more on the use of memory strategies or mnemonics to help learners store and retrieve any new vocabulary. Schmitt (1997) however differentiated his taxonomy by establishing a distinction between vocabulary discovery strategies (VDSs) and vocabulary consolidation strategies. According to Schmitt (1997), VDSs first deal with the discovery of the meaning of a new word, and they are reflected in two ways: determination strategies and social strategies. Determination strategies help learners guess the meaning of words by associating them with their previous knowledge; infer their meanings from "cognates", analyze their context with the help of other resources such as dictionaries, corpora, etc. Social strategies depend on interaction in the social context where learners may learn by communication and by asking their teacher, friends, peers, or native speakers about the meaning of a word.

On the other hand, Schmitt (1997) argues that the consolidation strategies deal with the storage of new words for later retrieval after the learners had mastered their meaning. These strategies are often categorized as social, memory, cognitive, and metacognitive sub-strategies. Social strategies, depend upon the social and personal situation of learners; memory strategies relate the learner with any memory of a word that a learner can remember; cognitive strategies enable the learner to manipulate words of a target language; and metacognitive strategies imply multiple activities like planning the learning of new words, making decisions about their learning processes and later assessing one's performance.

Making use of morphological devices like decoding and forming vocabulary is one of the sub-strategies that a language user may use to recognize a word and determine its meaning. Carlisle, McBride-Chang, Nagy, and Nunes (2010) considers morphological awareness as "the ability to reflect on, analyze and manipulate the morphemic elements in words (p. 466)" Soifer (2005) argues that the awareness of morphological principles is shown as a strong indicator of reading comprehension, and the weakness in the decoding skills is considered as an inhibitor to comprehend a text. The greatest challenge of decoding is the segmentation of words into affixes (prefixes and suffixes) and roots or base words with their origins. A few students may understand meanings of words by their spelling; however, this is more challenging since parts of words (affixes) can have separate meanings, or a morph (affix) can transform the entire word meaning. Table one illustrates a few examples showing how letter patterns and morphemes affect the meaning of words and word-class based on Schmitt (2008).

Table 1. Letter patterns and morphemes change the meaning of words

Root word (Part of speech)	Meaning	Affix	Word form (Part of speech)	New meaning
Affect (v.)	To influence something	-ion	Affection (n.)	Gentle feeling of love or liking
Effect (n.)	Influence of Impact	-ive	Effective (adj.)	Has an effect
Hard (adj)	Firm / tough	-ship	Hardship (n.)	Lack / suffering
Bard (n.)	Lyricist	em-	Embark (v.)	
Possible (adj)	Probable	im-	Impossible (adj)	Unbearable / incredible
Interest (n)	Concern / curiosity	-ing	Interesting (adj)	Stimulating / remarkable
		-ed	Interested (adj)	Concerned / attentive

This leads to understand that the manipulation of affixes (prefixes, roots, and suffixes) not only can impact the part of speech of a word but also its meaning in the context. It is now important to see whether such morphological manipulations using decoding strategies can prove to be an effective vocabulary learning strategy and can help students discover the meaning of unknown words, (Carreker, 2005; Wilson, 2005). More importantly, it is necessary to find out whether students can be taught such vocabulary learning strategies of segmenting or manipulating words according to their affixes and roots to recognize an unfamiliar word.

Vocabulary Learning Strategies (VLSs) in EFL/ESL context depend upon learners' knowledge of vocabulary. The ability to learn a foreign language is also determined by the level

and progress a learner has made in acquiring vocabulary. Here a few questions arise, such as: how should a learner prove his or her legitimate knowledge of vocabulary in the EFL context when it is important to first acquire the meaning of specific, unknown vocabulary items? How should a teacher know (after testing) which words or items of vocabulary learners have problems with? What strategies should teachers adopt to prioritize teaching of these unfamiliar words? Can there be any distinctions made in teaching strategies in order to determine the levels of learning the meaning of these words by learners?

To answer these questions, the study first assessed the vocabulary discovery strategies suggested in Schmitt's (1997) taxonomy. This helped the researcher to understand first, what learners practiced while reading a text containing unknown words; second, what strategies were used repetitively to learn the meaning of difficult words, as learners in EFL contexts, in general, tend to be slow learners. There were several other relevant issues like the type of learner control strategies, their decision making abilities in learning the meaning of words, the time required to complete this process, and how to go forward and backward, to change learning strategies in case of failing to discover the meaning of unknown or unfamiliar words (Azmy, 2000).

Discovering Meaning of Words

It is generally accepted that the higher the use of a word, the greater is the chance to acquire it. The ability to discover or familiarize with meanings of words determines the size of the vocabulary a learner possesses. Pedagogically, if learners depend upon teachers or parents, for learning vocabulary, it could affect their ability or autonomy to think and learn for themselves. But as they grow older, and they interact socially and contextually, they gain more autonomy and depend more upon themselves. A distinction here is often made that learners though learn formally from teachers or course planners, their focus is mostly on the words which they are able to relate to their context or learn autonomously (Williams, 1985). This phenomenon, of course, makes the teacher a little redundant for improving vocabulary, but the problem is faced in learning new words.

Several tests are available to determine the size of vocabulary a learner possesses and to ascertain the level of the knowledge of word meaning. For example, the X-Lex test enables a teacher to check the knowledge of 5000 most frequent words among learners of a target language on a comparative platform (Milton, 2009). Figure one illustrates how the X-Lex test provides normative figures of test-takers and their scale of knowledge in 5000 word bands in English as a foreign language.

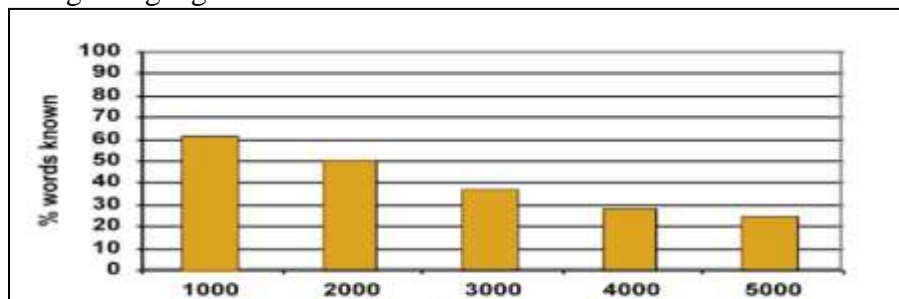


Figure 1. Profile of EFL learner's knowledge of words (Adapted from Milton, 2006a, p. 32)

Figure one depicts that EFL learners tend to know more vocabulary in the first 1000 words level, which gradually decreases in every band of 1000 words. Statistically, this proves that there exists a relationship between the words that a learner comes across and the size of vocabulary s/he possesses.

Laufer (1989) recommends knowledge of at least 95% of the vocabulary of a text to comprehend the meaning of words; Hu and Nation (2000) and Nation (2006) on the other hand argue that 98 to 99 percent of words should be known. These studies suggest that learners should possess a knowledge of around 6000-7000 words to read spoken discourse; 8000-9000 words to comprehend authentic texts; however, the number might increase in technical and academic texts, often up to 20,000 words (Nation & Webb, 2011).

In the context of the current study, it may be pointed out that the Saudi Ministry of Education (MOE), requires students of a high school to possess a vocabulary size of around 3000 words, but their performance is disappointingly very low (Al-Hazemi 1993). Such a low performance in schools has serious consequences for these learners when they reach a university. The low vocabulary size of Saudi learners at the university level hinders their progress and places a high burden on them, in all aspects of learning and not restricted to only reading and comprehending of the texts (Al-Homoud & Schmitt, 2009).

Research Significance

To resolve vocabulary deficiency issues, various taxonomies (Dörnyei & Scott 1997; Nation, 2001; Schmitt, 1997) have attempted to investigate and suggest remedial patterns to improve vocabulary learning. One common element in all these taxonomies is recognizing the disruption in vocabulary patterns, which is due to the consequence of lexical inadequacy and learners not aligning words to their context so as to discover their meaning. Hence this study was based on the premise that vocabulary proficiency depends much upon learners' understanding of the contexts in which specific vocabulary items, difficult and unfamiliar to them, are used. The researcher has thus argued in this study that in EFL classrooms, pedagogical strategies must be designed to suit how learners react to the contexts of each difficult or unfamiliar word and derive their meaning. Teachers must try to identify the problems and challenges that learners face and try to determine the factors responsible for such challenges. This will greatly help the teachers to determine the most feasible vocabulary learning strategies to help learners improve their vocabulary within their contexts.

Research Objectives

The principal objectives of the present study were to:

1. Identify the use of different VLSs at the discovery level among Saudi undergraduate English major students of English as a foreign language.
2. Find the most and least frequently VLSs used by Saudi undergraduate English major students.
3. Find the effective VLSs that help students determine or identify word meanings.
4. Identify the various types of self-selected or improvised learning strategies adopted by learners.

Therefore, the emphasis in this study was also to investigate how learners determined or discovered the most appropriate strategy, and with what design and method; and whether such strategies were learner controlled or teacher controlled.

Research Questions

This study aimed to answer the following research questions:

1. What are the various VDSs which are used by Saudi undergraduate EFL learners to find unknown word meanings?
2. What are the VDSs that are used the most and the least by Saudi undergraduate EFL learners to discover unknown word meanings?
3. Is there a relationship between the type of VDSs which Saudi undergraduate EFL learners implement to discover unknown word meanings used in a reading text and the number of correct meanings they accomplish?
4. Which is more effective for learners to discover the meanings of unknown words, the learner control or the teacher control strategy?

Literature Review

There is no dearth of studies on the subject of VLS (Schmitt, 1997; Tseng & Schmitt, 2008), and most of which have inferred that L2 learners of higher proficiency tend to use VLSs more often than weaker students (Barcroft, 2009; Fan, 2003; Gu, 2002; Gu & Johnson, 1996; Winke & Abbuhl, 2007). Some of these studies also indicate that students with higher proficiency of L2 use VLSs that require more cognitive effort (Borer, 2007; Catalán, 2003). Schmitt (1997), for instance, describes VLSs as “(...) the processes by which a learner obtains, stores vocabulary items when encountering a word for the first time and retrieves, remembers and uses vocabulary items when communicating” (p. 203). For instance, using a dictionary, guessing a new word meaning from the context, and the use of morphological information, such as affixes and parts of speech are considered as the most frequently used strategies for learning the meaning of new words. Foreign or second language learners often use certain strategies to remember and realize words such as connecting words to their synonyms, antonyms, collocations, and grouping words together into categories.

In his pertinent taxonomy, Schmitt (1997) classifies VLSs as determination, discovery, social, or consolidation strategies. Determination strategies are for example the techniques when learners use morphological information such as affixes and word formation processes to determine the meaning of words. They may also use their knowledge of the language, contextual clues, or reference materials to figure out the meanings of new words. Secondly, strategies for gaining initial information about a new word are called discovery strategies. Thirdly, if they ask someone to help, such as a classmate, family member or teacher, this is known as social strategies. Finally, when learners are introduced to a situation where a new word is required, they have to make some effort to remember and use their lexical knowledge; this is called consolidation strategies.

Schmitt (1997) based his theories of VLS on different age groups of L2 learners such as junior high school learners, high school learners, university learners and adult learners. He found that less experienced L2 learners relied more on mechanical learning strategies such as oral and

written repetition, word lists, and flashcards as compared to learners with higher L2 proficiency. But the higher L2 proficiency learners, prefer to use more complex metacognitive strategies such as the use of dictionaries, guessing from context, imaging word meanings, asking teachers for paraphrases or synonyms, word part analysis, and connecting words with personal experiences. Schmitt's argument was supported by Nyikos and Fan (2007), and Anderson (2005) who too observed that such L2 learners succeed in vocabulary learning who select more complex and task-compatible strategies for learning new L2 words. In this regard, a very good example was cited by Nopriato and Purnawarman (2019) who studied the level of implementation of VLSs of Indonesian L2 learners and concluded that Indonesian learners showed moderate use of VLS with more emphasis on the determination category of VLSs. Memiş (2018), in a recent study, also reached a similar conclusion who reported that strategies used by L2 learners varied according to their language level.

Studies have advocated categorizing L2 learners based on the adoption of specific cognitive learning strategies (Ahmed, 1989; Lawson & Hogben, 1996). The rationale behind this suggestion is that L2 learners of higher proficiency or who are more successful academically, have greater access to a wider variety of cognitive learning strategies (Ahmed, 1989), while learners who are less successful or academically weak have access to fewer strategies and hence use them inadequately. This argument is consistent with writers (Baumann, Kame'enui, & Ash, 2003; Borer, 2007; Ellis, 1995; Schmitt & McCarthy, 1997) who favor cognitive psychology and emphasize upon giving more cognitive effort to learning vocabulary.

This is consistent with Liu and Nation (1984) who also observed a similar phenomenon in advanced L2 learners and those of higher proficiency (as cited in McCarthy, 1988), whose guessing percentage of unknown words ranged between 85% to 100%. However, Ahmed (1989), and Gu, and Johnson (1996) in two different studies found the guessing strategies to be higher among the L2 learners of higher proficiency. Guessing in L2 learners refers to a strategy most popularly used VLSs (Schmitt, 1997) in order to derive meanings of unfamiliar words from context while reading texts (Dubin, 1993). Context according to Nation and Coady (1988) has two types: textual, which encompasses morphological, semantic, and syntactic contexts of the text, and the second is the general or social context. This may also refer to the background knowledge or the social context of readers.

Prior studies on VDSs reveal exclusively concentration on guessing from context (Nation & Coady, 1988; Bialystok, 1999; Ahmed, 1989; Haynes, 1993; Schmitt, 1997). Nation and Coady (1988), for instance, define specific context as "other words and sentences that surround a word and which often "throws light on" its meaning (p. 122). Carter and McCarthy (1988) also call context as within the text classified as morphological, syntactic, and discourse. All these studies have found guessing strategies differing significantly and varying according to the learners' grade or level. Besides, it was also felt that making use of background knowledge (schema) enhances learners' ability to conduct cognitive strategies through reasoning, and analysis of word and sentence structure, and so improves their abilities to acquire new words (Oxford, 2003). In the Saudi Context, Al-Harbi, and Ibrahim (2018) conducted a study to identify the VLSs that Saudi first-year English major students use to learn English words. They implemented a questionnaire to collect the data from the participants' perceptions. Their results indicated that the participants

preferred to use less demanding compared to deeper demanding cognitive strategies. Responses of the participants showed that when trying to learn a new word, they depend more on repeating that word, then they tend to guess meanings through context and interacting with English native speakers. While the social strategy is used most, 'memory' is used the least by the students in their survey.

Further, studies have also revealed that guessing as context strategy is more often used by L2 learners of higher proficiency and that there exists a higher correlation between guessing and vocabulary knowledge (Zhang, 2009). O'Malley, Chamot, Stewner-Mananaraes, Kupper, & Russo, (1985), too, discovered contextualization used more by advanced learners as compared to beginners. A reason often cited for this is that beginners lack the level of proficiency that is required to exercise contextualization as a VLS (Cohen & Aphek, 1981). Huckin and Coady (1999) draw attention to this limitation of 'guessing from the context'. According to them, guessing is accepted as significant for vocabulary-building among advanced learners, as it requires prior training in basic vocabulary processing, word recognition, metacognition, and subject matter, which is lacking among the beginners.

Closely associated with guessing is mnemonics as a popular memory strategy among the VDSs. Pioneered by works of Cohen and Aphek (1981) and later revisited by Cohen (1990), mnemonics can be categorized in several types such as (i) associating the target words to sounds in L1 or L2 familiar to learners (ii) breaking the word into parts (morphemes) and helping the learner to recognize the meaning of the familiar parts; (iii) helping the learner to derive meaning from the word's structure and trying to relate the word with another word; (iv) building semantic relationship and grouping words of the same topic together; (v) helping learners in visualizing a word or its letters with its context (vi) associating the word to its situation where it appeared; (vii) helping learners to create mental imagery of the word; (viii) linking word(s) with physical sensation, feeling or emotion, and (ix) linking the word to a keyword in the L1 whose pronunciation may be similar to the target word.

Conceptual Framework

This research study aimed at extending Schmitt's (1007) taxonomy to identify suitable VLSs for EFL learners. In order to understand the meaning of new words, Schmitt (1997) had classified vocabulary discovery strategies into two types: Social Strategies and Determination Strategies. The focus of the study was to evaluate the VLSs in the social as well as determination context as postulated in Schmitt's taxonomy. The objective was also to understand what learners practice while reading a text containing unknown words. In this process, the researcher also dealt with both learner control and teacher control strategies and their contribution to learning meanings of new words.

The learner control strategy included decision making during the time allotted for learning to accelerate learning through strategies such as decoding or guessing or seeking help (in a social context) from teachers, friends, peers, and family in case of failing to get the correct answer. This is similar to the views of Tamjid and Moghadam (2012) and Khoshnoud and Karbalaie (2015) who associated learner control strategies with learner autonomy, tracking and sequencing of learning,

and observing learners' enrichment of their vocabulary by guessing meanings of unfamiliar words from the context.

The teacher control strategy, on the other hand, was seen in this study as a teacher centered practice that included factors such as pre-determined teaching models, personalized teaching methodology, and assessment based learning. These factors would help teachers determine whether learners have appropriate knowledge of the unknown words. The objective of using both learner control and teacher control strategies was to determine the choice of appropriate control methods in teaching and consolidating meanings of unfamiliar words. Figure two illustrates this conceptual model adopted in this study.

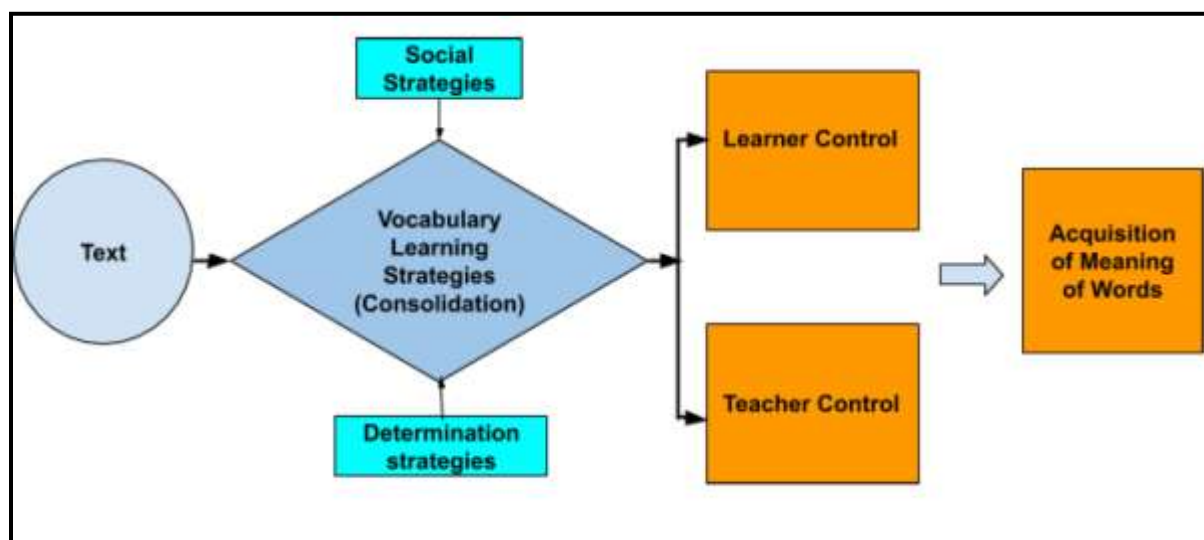


Figure 2. Conceptual model based on Schmidt's theory of VLS

This model is the representation of the premise adopted for this study which suggests that teachers may adopt a linear approach to understand how social and determination strategies could help teachers to investigate whether it is the learner controlled or teacher controlled VLSs that help learners most to acquire the meaning of unfamiliar words in a text. This model was designed as the conceptual framework of this study, to investigate the most appropriate VLS; whether it is the teacher control strategies wherein a language teacher focuses on the teaching of difficult or unfamiliar words through pedagogical methods, or the learner control strategies wherein the learner uses the contexts to acquire the meaning of difficult or unfamiliar words. The study thus focused on finding the appropriateness of learning strategies as well as the design and method (e.g. learner control or teacher control) that could be used to discover the meaning of unknown words.

Methodology

Participants

This study involved all the 67 male undergraduate English major students of Prince Sattam bin Abdulaziz University (PSAU) who passed the "Vocabulary" course occurring in their second semester of the academic year 2019. As set in the course syllabus, students passing this course should possess a reasonably good knowledge of vocabulary ranging between 4000 to 5000 words.

Through purposeful sampling, a group of 50 students was identified. However, to control the proficiency level of the participants, and to concentrate more on the average students, above average students (eight) out of the 58 ones who passed the course with a score of 85% and above were excluded from the experiment. And by default, those nine students who got below 60% in the course were also excluded since they were treated as below average achievers.

Instruments

A questionnaire adapted from Schmitt's (1997) and Nation's (2001) taxonomies of VLSs was administered. The questionnaire consisted of two parts. The first part was intended to help the researcher manage the administrative part of data collection and coding. The second part of the questionnaire aimed to collect data about the participants' implementation of the VLSs as shown in Table one. An eleven-item questionnaire was created. It was adapted to represent the vocabulary learning strategies used by the participants in discovering the meanings of unknown words. These strategies were grouped under four major categories. The first is "Use of word form and contextual clues" and it covered the first three strategies: a) I conduct contextual guessing, b) I pay attention to the structure of the new words, c) I break the word into parts that I can identify, and d) I guess the grammatical class of the word. The second is the "Use of phonics – word sounds", that included a) I associate the sound of the new word with the sound of a word that is familiar to me, b) I use rhyming to remember new words, and c) I guess the meaning of the new word by its sound). The third category "I ask my classmate" had one item because participants were given the chance to interact or socialize only with their classmates. The fourth category "Use of online dictionaries and translation services", dealt with the participants' use of a) electronic dictionaries, b) instant on-screen computer translation programs, and c) the Microsoft Word Thesaurus icon.

All strategies were presented vertically in serial order in the form of participants' statements and 20 words were sampled from a reading text (Appendix A) and listed horizontally on the top of each column (Table two). The participants were unambiguously asked to tick mark the correct choice of the strategy that they would use to discover the meaning of the word listed. To study the relationship between the strategies implemented and the ability to discover word meanings, the participants were asked to provide the meanings of the unknown words (even in native Arabic language) in the last column of the questionnaire. It is also important to indicate that an extra column entitled (Already known to me) was given in the questionnaire for the participant to tick if any of the targeted words were known to them.

Table 2. *Questionnaire items, showing the choice of Vocabulary discovery strategies of sampled words*

		Unknown or Unfamiliar Words from 1 to 20					
		Synonym ous (1)	Freelan ce (2) up to		Exception al (20)	Word Meaning
	Unknown Word						
	Word Meaning						
	I already know the word (Please ✓)						

	The strategies I used to discover word meanings (Please ✓) as many used							
1	I conduct contextual guessing							
2	I pay attention to the structure of the new words.							
3	I break the word into parts that I can identify.							
4	I guess the grammatical class of the word							
5	I associate the sound of the new words with the sound of a word that is familiar to me.							
6	I use rhyming to remember new words.							
7	I guess the meaning of the new vocabulary item by its sound							
8	I ask my classmate							
9	I use electronic dictionaries							
10	I use instant on-screen computer translation programs							
11	I use the Microsoft Word Thesaurus icon							

A reading text was adopted from TOEFL Practice Tests (Appendix A) to select unknown words through a rigorous process. Initially, (22) words were claimed unfamiliar because the participants should not have come across those words before as they appeared in terms of the structure or form used in the reading text. Secondly, these words were also not included in the glossary of their Vocabulary textbook. A group of EFL specialists in the Department of English was consulted to validate these words as unknown. However, in any case of having a word in that list be familiar to a participant, he was asked to avoid treating it as a new word, and so to indicate that by ticking the cell (Already known to me) as shown in Table two.

The participants were asked to fill out the questionnaire while working on discovering meanings of the unknown words (with hands-on, but not through their previous experiences with new words). Strategies implemented in discovering meaning were linked immediately with whether meaning discovered was correct or not. This procedure helped the researcher identify the relationship between the strategy used and the meaning achieved, and to investigate the effectiveness of using the strategy in the context of this experiment.

Procedures

To make sure that all participants in the study were aware of the discovery strategies used to learn meanings of unknown words, a special training session adopted from O'Malley & Chamot's (1990) training model was administered to all of them. The model included steps and actions that the teacher implemented for instructing the students. The participants attended a six-hours training course distributed equally between three consequent days. This training was carried out to equip all participants with the theoretical knowledge and practical skills they needed to implement the different discovery strategies. Immediately on the day, the training was over, the experiment was carried out. Participants were distributed to two English Computer labs. Each participant worked on a computer set with the reading text uploaded. A hard copy of the questionnaire presented on two pages was handed over to each participant to tick the cells where appropriate and to write the meanings of the unknown words while going through the reading text and as they will have implemented the discovery strategies to find out the meanings of the words targeted. They were advised that it was possible to implement more than one strategy to find out the meaning of each word, and once reached, they need to write that meaning even in Arabic in the cell box given next to each item. The time for the experiment was also shown in the "instructions" part of the questionnaire (Two and a half hours). Questionnaire sheets were collected back at the end of the time fixed.

Data Analysis

A descriptive analysis of the data was conducted to identify the number of the unknown words that the participants got correctly, and the number of times each strategy was implemented. This analysis of the data also aimed to elicit the most-used, least-used, and never-used strategies for determining the meanings of the unknown words as part of the process of vocabulary learning. The Pearson coefficient using the SPSS software was also used to calculate the relation between strategy type and the number of correct unknown word meanings accomplished by the participants.

Table 3. Means and standard deviations for correct word meaning discoveries across the four categories

Meaning Discovery	N	Sum	Mean	Std. Deviation
1. Meanings discovered correctly through using word form and contextual clues (Strategy 1)	50	310.0	6.200	3.3564
2. Meanings discovered correctly through using phonics - word sounds (Strategy 2)	50	50.0	1.000	.6701
3. Meanings discovered correctly through using social interaction (Strategy 3)	50	37.0	.740	.6943
4. Meanings discovered correctly through using online dictionaries and translation services (Strategy 4)	50	266.0	5.320	1.2526
Vocabulary Score	50	663.0	13.260	2.9541
Valid N (list-wise)	50			

The first research question in this paper attempted to find out the various determination strategies that the Saudi students of EFL at PSAU of Saudi Arabia use to identify meanings of unknown words occurring in a reading text. Descriptive data analysis revealed that the participants' mean score on the vocabulary test was 13.26 out of 20 words (Table three), with the highest and the lowest scores (18) and (8), respectively. This means that by using the different determination strategies, the participants were able to identify the meanings of about 13 words out of the 20 unknown words occurring in the reading text.

Table 4. *Frequency of correct discoveries of meanings of unknown words across four categories*

	Frequency of use	%	Meaning discovered correctly	% of the correct meanings out of total correct meanings achieved	% of correct meanings out of frequency of use
Strategy 1: Word form and contextual clues	418	41.8	310	0.468	74.2
Strategy 2: Phonics - word sounds	129	12.9	50	0.075	38.8
Strategy 3: Social interaction	85	8.5	37	0.058	43.5
Strategy 4: Online dictionaries and translation services	368	36.8	266	0.401	72.3
Sum	1000*	1	663**	1	

*50 participants X 20 unknown words = 1000 frequencies

**frequency of correct discovery of meaning of unknown words

To answer the second research question about what VDSs were used the most and the least by Saudi undergraduate EFL learners to discover the meanings of unknown words, a detailed analysis of the participants' responses was carried out. Table four indicates that the total implementation of strategies was 1000 times distributed between the four categories as follows. Strategy one "use of word form and contextual clues" was used the most. Participants used this first strategy 418 times (percentage 41.8%), and within this implementation, the achievement of correct word meanings was repeated 310 times ($310 \times 100 / 663 = 46.8\%$ of the total score). This means that this strategy was not only used more than the other strategies, but it also enabled participants to accomplish 46.8% (higher than the rest of the strategies) of the total correct meanings discovered. Moreover, ($310 \times 100 / 418 = 74.2\%$ of the participants' guessed the word meanings out of the 418 implementations of Strategy one were correct.

The second top implemented strategy was the use of online dictionaries and translation services (Strategy four). This strategy was repeated 368 times (36.8%) with 266 correct discoveries of unknown meanings of words (40.1%). The Participants' correct guesses were ($266 \times 100 / 368 = 72.3\%$ out of the 368 implementations of this strategy). The "word sounds and phonics strategy" came in third place. It was used 129 times (12.9%) with 50 correct discoveries

(7.5%). However, 38.8% of word meanings were guessed correctly out of their 129 implementations. Lastly came the “social interaction strategy” which was used 85 times (8.5%) in which 37 correct discoveries (5.8%) out of the total correct guesses were achieved. However, the percentage of correct guesses (43.5%) out of the implementation times was higher than that of the third strategy.

The third research question aimed to find out whether there was a relationship between the type of VDSs which Saudi undergraduate EFL learners implemented to discover unknown word meanings used in a reading text and the number of correct meanings they accomplished.

To find out whether there was a relationship between the participants’ implementation of the vocabulary determination strategies and their ability to identify the meanings of the unknown words, a correlation test was operated. Results of Pearson test (Table five) demonstrated that the “use of word form and contextual clues” highly correlated with the participants’ score on the vocabulary test (0.826). This significant positive correlation suggested that the more participants relied on using word form and contextual clues to identify meanings of unknown words, the higher their scores would be on the vocabulary test. That is, their ability to identify the meanings of unknown words increased when they used word structure and context clues. However, this test revealed that the use of the other three strategies of using word phonics of sound, social interaction, and online dictionaries and translation services significantly correlated, but negatively with the participants’ score on the vocabulary test (-0.593, -0.419, and -0.631, respectively). These negative correlations indicated that the participants’ scores on the vocabulary test tended to decrease when they implemented these last three strategies to detect meanings of unknown words.

Table 5. *Pearson test of correlation between vocabulary scores and vocabulary discovery strategies*

		Vocabulary Score	Use of word form and contextual clues	Use of phonics – word sounds	Use of Social strategies	Use of Online dictionaries and translation services
Vocabulary Score	Pearson Correlation	1	.826**	-.593**	-.419**	-.631**
	Sig. (2-tailed)		.000	.000	.002	.000
	N	50	50	50	50	50

**Correlation is significant at the 0.01 level (2-tailed)

Discussion

The primary goal of this study was to investigate the use of the vocabulary discovery strategies by the undergraduate Saudi EFL students, in addition to their effects on students’ ability to identify meanings of unknown words they encounter in reading texts. One interesting finding which came

to light through the present study was the significant role of analyzing the context where an unknown word occurred in terms of the structure of the word itself, and its grammatical class. These sub-strategies when put together under Strategy One were implemented more than the rest of the VDSs by the participants of the study, and this is consistent with the findings of most of the studies reviewed in the literature part such as Anderson, (2005), Baumann, Kame'enui, & Ash, (2003), Borer (2007), Ellis (1995), Memiş (2018), Schmitt & McCarthy (1997), Nopriato and Purnawarman (2019), and Nyikos & Fan (2007). This is a clear indication that guessing the meaning of a word from context requires performing higher levels of cognitive processes. The results of this study showed that contextual clues and word structure had a significant positive effect on the participants' ability to identify the meanings of unknown words. On the other hand, the least implemented strategy realized in this study was the social strategy, and this result is consistent with the findings of some studies such as those of Schmitt (1997), and Blachowicz and Fisher (2004).

The results of this study revealed that the participants relied on using online dictionaries and translation applications in addition to Microsoft Word Thesaurus services as their second option to look up word meanings, regardless of their accuracy to identify word meanings. Although linguists and researchers like Hosenfeld (1977) argued that looking up words in a dictionary should come as the last option in the process of identifying unknown word meanings, it has also been stated that even successful readers do it after failing to identify word meanings through more efficient strategies. Even when using this strategy, foreign language learners need to have the linguistic competencies, and this may refer them back to their prior knowledge related to word affixation system and its part of speech, sentence structure, and the surrounding context to remove meaning ambiguity of the word and to reach the appropriate meaning targeted. This justifies participants' scores on the vocabulary test carried out in this study. Although the meanings of the unknown words that the participants encountered in the reading text were possible to reach through dictionaries and other online applications, only 72.3% of their guesses were correct after using this strategy (Table four), and so this result agrees with Hosenfeld's (1977) argument. Deciding on appropriate meanings of words using this strategy is not an easy job for learners unless they deem to make sure of word meanings identified earlier depending on learners' memory, language competencies, and contextual details. This explains why the contribution of implementing dictionaries and translation tools was less than that of Strategy one.

One could also think of the paradox in the results related to the social strategy. Although numerous research emphasized the role of the social strategy in helping learners determine meanings of unknown words (Alharbi & Ibrahim 2018; Nation 1990, 2001; Nunan 1999; Oxford 1990, 2003; Schmitt 1997), findings of this study revealed that its contribution was the least in terms of implementation (0.085) and discovering meanings of unknown words. It is also important to mention that the only possible interaction for students was the neighboring classmates during the experiment. So, teachers as the most informative source for social interaction were excluded, and this could be the reason for the decrease in the mean scores of the correct guesses related to this strategy.

At this stage, the last research question of the study was analyzed to find out whether the learner control or the teacher control strategy was more effective to discover the meanings of unknown words and to find if the social context plays a role in that process. Based on the findings of the study, the conceptual framework (Figure two) was revisited to find the answer to this question. Figure three illustrates how learner control and teacher control strategies function in a social context. The learners in the social context would try to find out the meanings of unfamiliar words utilizing hints from the context instead of the more common methods such as understanding meanings of words from their structural knowledge of the language, guessing, etc., or other strategies like translation, synonyms, paraphrasing, or morphing a word to discover its meaning. Based on the findings of the study, this framework testified the balanced control of both the learner control and the teacher control strategies (Figure three). The findings were expected to reveal that while the teacher would be successful in tackling some types of unfamiliar words, learners, on the other hand, would be able to discover the meanings of words through various methods including cognitive processes like decoding. Hence, the items of the questionnaire would be focused on such decoding strategies adopted by learners to discover the meanings of unfamiliar words using the cognitive as well as the social strategies. The role of the teacher was also revealed to be important in the application of this conceptual model as the teacher control mechanism determined whether VLSs adopted by students in discovering meaning were appropriate and that they were competent enough to use such strategies effectively.

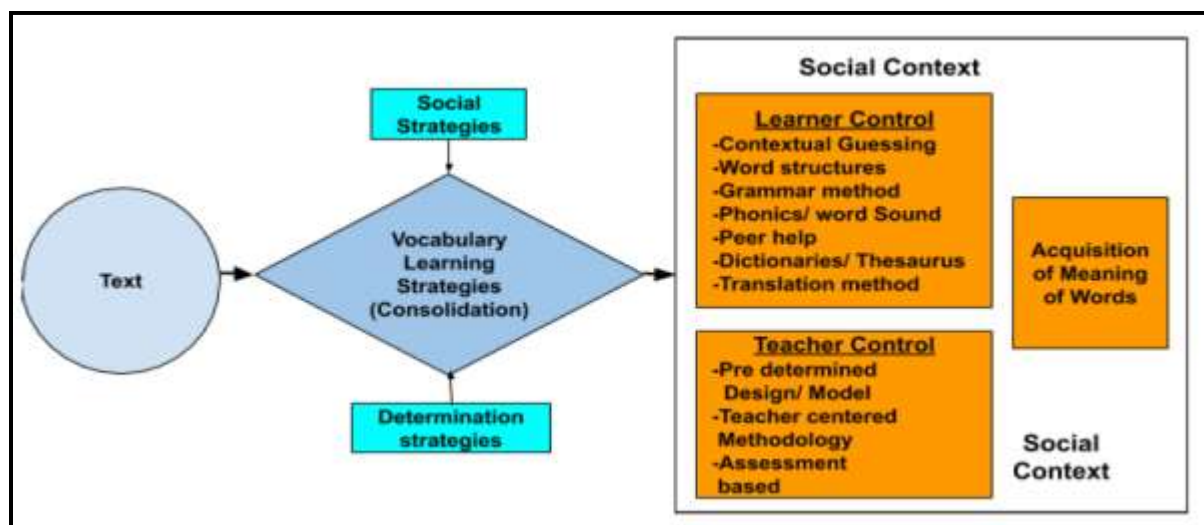


Figure 3. Learner control and teacher control strategies in a social context

Additionally, using words in a social context motivates learners and prepares them for group learning out of the class. Since there is a minimal role of the teacher in the social context method, Schmitt (1997) observes that students are in a better position to use and manipulate the language in the class. This is consistent with Tamjid and Moghadam (2012), and Khoshnoud and Karbalaee (2015) findings which also observed that learners enhance their vocabulary by guessing meanings of unfamiliar words from the context; and with Ahmed (1989) who found that making use of any given context is far more facilitating than established methods like translation, paraphrasing or giving the synonym of the word.

An important factor that could have affected the results of this study is related to the training session that the participants had gone through immediately before enrolment in the experiment. Although the students were exposed to different VLSs in different language skills courses, this training on the VDSs must have played an important role in activating their background knowledge about how and when to use the different VDSs, not to forget the exercises and activities used to practice authentic implementation of the strategies targeted. This special kind of intensive training compared to the results achieved leads to consider the role of both the teacher and the learner in improving learners' efficient implementation of VLSs in general. All through the instructional process, teachers and textbooks should have a kind of control over the choice of the VLSs that learners should implement to acquire new vocabulary items. While the control of the teacher should decrease gradually in response to learners' improvement, learners' control level should increase until they master this aptitude and become able to implement appropriate VLSs.

Conclusion

The focus of the current study was to evaluate the use of different VLSs as stated in Schmitt's (1977) taxonomy at the discovery level in the process of vocabulary acquisition. The findings of this study revealed the importance of exposing students to an explicit type of training to enhance their proficient use of VLSs that helps them learn unknown words and so to become better readers of English. This can also be achieved by designing exercises where teachers at initial training sessions direct students to implement specific strategies to figure out meanings of unknown words. At later stages, the control moves gradually to the students who should have control over the choice of the appropriate strategies they may implement to reach correct meanings of unknown words occurring in different contexts. It's also important for teachers to bear in mind that learning new words is not at all a simple process and so FL students should be aware that they may use various strategies to learn meanings of unknown words. However, teachers' greatest concern should be directed toward training students to become familiar with and be able to use the different VLSs, because once they become able to use these strategies skilfully, they will have the confidence to use more appropriate strategies to learn new words, and so the control of choosing this or the other strategies will be theirs. However, giving lists of words to students to learn does not result in effective learning.

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About the Author:

Mohammed Abdulmalik Ali is an assistant Professor at the Department of English of Prince Sattam bin Abdulaziz University. He got his PhD in Applied Linguistics from Loughborough University, UK. His research interests include SLA and language instruction, computer-assisted language learning, and machine translation. **ORCID:** <https://orcid.org/0000-0002-4942-8003>

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Appendix A

Reading Text

Retrieved in February 2020, from the online Free Practice Tests for learners of English TOEFL® Reading Test 4. https://www.examenglish.com/TOEFL/toefl_reading.htm

*The words underlined and numbered were sorted out as unknown / unfamiliar words in this study.

ROBERT CAPA

Robert Capa is a name that has for many years been (1) synonymous with war photography. Born in Hungary in 1913 as Friedmann Endre Ernő, Capa was forced to leave his native country after his involvement in anti-government protests. Capa had originally wanted to become a writer, but after his arrival in Berlin had first found work as a photographer. He later left Germany and moved to France due to the rise in Nazism. He tried to find work as (2) a freelance journalist and it was here that he changed his name to Robert Capa, mainly because he thought it would sound more American.

In 1936, after the breakout of the Spanish Civil war, Capa went to Spain and it was here over the next three years that he built his (3) reputation as a war photographer. It was here too in 1936 that he took one of his most famous pictures, *The Death of a Loyalist Soldier*. One of Capa's most famous quotes was 'If your pictures aren't good enough, you're not close enough.' And he took his attitude of getting close to the action to an extreme. His photograph, *The Death of a Loyalist Soldier* is a prime example of this as Capa captures the very moment the soldier falls. However, many have questioned the (4) authenticity of this photograph, claiming that it was (5) staged.

When World War II broke out, Capa was in New York, but he was soon back in Europe covering the war for Life magazine. Some of his most famous work was created on 6th June 1944 when he swam (5) ashore with the first (7) assault on Omaha Beach in the D-Day (8) invasion of Normandy. Capa, armed only with two cameras, took more than one hundred photographs in the first hour of the landing, but a mistake in the darkroom during the drying of the film destroyed all but eight frames. It was the images from these frames however that inspired the visual style of Steven Spielberg's Oscar winning movie 'Saving Private Ryan'. When Life magazine published the photographs, they claimed that they were slightly out of focus, and Capa later used this as the title of his (9) autobiographical account of the war.

Capa's private life was no less dramatic. He was friend to many of Hollywood's directors, actors and actresses. In 1943 he fell in love with the wife of actor John Austin. His affair with her lasted until the end of the war and became the subject of his war (10) memoirs. He was at one time lover to actress Ingrid Bergman. Their relationship finally ended in 1946 when he refused to settle in Hollywood and went off to Turkey.

In 1947 Capa was among a group of (11) photojournalists who founded Magnum Photos. This was a co-operative organisation set up to support photographers and help them to retain ownership of the copyright to their work.

Capa went on to document many other wars. He never attempted to (12) glamorise war though, but to record the horror. He once said, "The desire of any war photographer is to be put out of business."

Capa died as he had lived. After promising not to photograph any more wars, he accepted an assignment to go to Indochina to cover the first Indochina war. On May 25th 1954 Capa was (13) accompanying a French (14) regiment when he left his jeep to take some photographs of the advance and stepped on a land mine. He was taken to a nearby hospital, still (15) clutching his camera, but was (16) pronounced dead on arrival. He left behind him a (17) testament to the (19) horrors of war and a standard for photojournalism that few others have been able to reach.

Capa's legacy has lived on though and in 1966 his brother Cornell founded the International Fund for Concerned Photography in his honor. There is also a Robert Capa Gold Medal, which is given to the photographer who publishes the best photographic reporting from abroad with evidence of (20) exceptional courage. But perhaps his greatest legacy of all are the haunting images of the human struggles that he captured