Assessing the Relationship between Vocabulary Learning Strategy Use and Vocabulary Knowledge

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Abstract

This study is an attempt to explore the correlation between direct and indirect vocabulary learning strategies along with the depth and breadth of vocabulary knowledge. To this end, a sample of 145 low proficiency students who learn English as a Foreign Language (EFL) completed a questionnaire concerning vocabulary learning strategy use. Vocabulary Levels Test (Schmitt et al., 2001) and Word Associates Test (Read, 1993; 2004) were administered to measure the breadth and depth of lexical repertoire respectively. The results indicated that (a) direct strategies were frequently used by EFL students (except for direct cognitive analyzing strategy), and (b), indirect strategies were less frequently used strategies. Participants' scores in strategy use were correlated significantly and positively with breadth and depth of vocabulary knowledge. However, indirect strategy use had a higher level of correlation with two dimensions of

vocabulary knowledge, implying that EFL students with a higher level of depth and breadth of lexical repertoire tended to use strategies that are more indirect. This highlights the importance of indirect strategies, e.g., self-planning, self-monitoring, and self-evaluating. These and other relevant pedagogical implications were discussed.

Keywords: vocabulary learning depth of vocabulary knowledge, breadth of vocabulary knowledge, vocabulary development

Introduction

It is widely acknowledged that learning vocabulary is an essential part of mastering a language, and text comprehension or production heavily depends on the command of vocabulary knowledge (VK). Hence, vocabulary knowledge is important for EFL students because they need sufficient knowledge of the words before they can comprehend what they have read or heard (Teng, 2014a). As stated in Fan (2003), vocabulary knowledge is the biggest part of learning a language. Vocabulary knowledge includes two dimensions: breadth of vocabulary knowledge and depth of vocabulary knowledge. Breadth of vocabulary knowledge is regarded as vocabulary size, i.e., the quantity of words that a learner at a certain level knows (Nation, 2001). Depth of vocabulary knowledge refers to the quality of knowing a word, which means learners should know more than a superficial understanding of a word's meaning. For example, learners should know deeper aspects of a word, including pronunciation, meaning, spelling, register, frequency, morphology, syntactic and collocational prosperities (Qian, 2002). Considering the importance of vocabulary knowledge, finding ways to improve learners' vocabulary knowledge is worthwhile.

There has been an increasing interest in learner autonomy (LA) in language teaching and learning in recent years. Many researchers regard LA as a role that fosters language proficiency

(e.g., Benson, 2006; Champagne et al., 2001; Dam & Legenhausen, 1996; Harmer, 2001; Holec, 1981, 1988; Humphreys & Wyatt, 2014). At the same time, new research has appeared that LA is accepted as a universally promoted method for learning English socially and culturally in Japan (Ogawa, 2012), and Vietnam (Humphreys & Wyatt, 2014; Nguyen, 2009). In a promising way, pedagogy and research appear to increasingly recognize that the uncritical idea of LA is a universal human capacity that can be legitimately applied in an EFL context (Aoki, 2011; Aoki & Smith, 1999; Smith, 2003; Teng, 2015a).

Research in the field of LA currently is based mainly on three elements: the nature of LA, autonomous learning strategies, and possible intervention training that can promote LA and the students' language proficiency level (Benson, 2001). The nature of LA is regarded as self-directed learning, and it is more or less equivalent to effective learning (Dickinson, 1987; Gremmo & Riley, 1995). In addition, previous research (Nguyen & Gu, 2013; Zhang &Wu, 2009), which focused on promoting language proficiency through intervention training, shed light on the third element mentioned above. However, research on the second element related to autonomous learning strategies has received relatively little attention (Nemati et al., 2011). It is widely acknowledged that learners use specific autonomous learning strategies to improve their lexical studies. Likewise, vocabulary-learning strategies are important because they are steps for self-directed learning which is necessary for developing learners' lexical competence (Illés, 2012).

Oxford (1990) divided vocabulary-learning strategies into two categories: Direct and indirect. Direct strategies, known as learning the target language directly, include cognitive strategies, memory strategies, and compensation strategies. Cognitive strategies, such as summarizing or reasoning deductively, allow learners to comprehend and produce new language by different means. Memory strategies facilitate the learner's store of knowledge and help in retrieving new information. Compensation strategies, such as guessing intelligently while reading, enable

learners to use the language despite their large gaps in linguistic knowledge. Learners apply these strategies directly to learn new linguistic items. Indirect strategies, in contrast, are those strategies that support vocabulary learning without directly focusing on the target language (Oxford, 1990, p. 135). Indirect strategies include social strategies, metacognitive strategies of self-planning, self-monitoring, self-evaluating, and affective strategies. Social strategies facilitate students when learning new words through interaction with others. Metacognitive strategies help learners control their own cognition, i.e., to coordinate their learning process by planning, monitoring, and evaluating. Affective strategies allow learners to regulate their motivations, attitudes, and emotions. These strategies indirectly contribute to learners' vocabulary learning.

The present study examined the direct and indirect vocabulary learning strategies presented by EFL learners in China. The purpose was to identify the correlation between their strategy use and vocabulary knowledge (VK). Although many previous studies have focused on assessing relationships between strategy use and vocabulary learning, in-depth research on assessing the relationship between the breadth and depth of vocabulary knowledge is limited.

Literature Review

Learner Autonomy (LA)

The term 'learner autonomy' has been a catch phrase in teaching EFL since the 1990s. Holec (1981), one of the pioneers to promote the importance of LA in teaching English, defined autonomy as "An ability to take charge of one's own learning" (p.3). Put succinctly, EFL learners should be responsible for setting objectives, preparing content, choosing suitable methods, monitoring the progress of learning, and evaluating what has been learned. One of the highlighted points in Holec's definition was that "LA is not inborn, but attained through natural means or a systematic and deliberate way" (Holec, 1981, p.3). On the other hand, main proponents of learner autonomy described it as an

'ability' or 'capacity' for self-directed learning (Holec, 1988; Littlewood, 1999). In other words, it is the ability to act independently, and is the capacity for organizing one's own studies. Although some researchers (Norman, 1994; Stone, 1990) argued that learner autonomy is of limited value, the worthwhile values of learner autonomy are widely recognized and more research is needed in the field of LA (Benson, 2001).

In addition to manipulating the process of learning, learner strategies have been considered an important component of LA. Based on this, Benson (1997) divided the psychological aspects of LA into 'technical' and 'constructivist' components (Benson, 1997, p.13). The 'technical' aspects refer to the strategy training; the 'constructivist' aspects refer to the learners' internal development of attitudes, capacity of managing self-learning, and the teacher's scaffolding role. Benson's view was a supplement to the original psychological aspects of LA because it combined the social process of interacting with other people and the individual process of internal learning. His definition, both practically and theoretically, served as a beginning in research on LA (Illés, 2012). Researchers then became interested in doing research in strategy use. As proposed by Benson (2001, p.65), "Learners who achieve outstanding proficiency in learning a foreign language did so at least partly because of exerting control over use of strategies to initiate, control, or direct learning processes."

Strategy use and vocabulary development

As mentioned previously, many previous studies have repeatedly focused on assessing the relationship between vocabulary learning strategies and vocabulary learning. This section summarizes the major characteristics of the studies in this field.

Gu and Johnson's (1996) research is one pioneering study in assessing the relationship between vocabulary learning strategies and vocabulary learning proficiency, and provides a basic framework for conducting the present study. In their study, they attempted to identify the vocabulary learning strategies used

by Chinese tertiary-level EFL students, and assess the relationship between their frequent use of strategies and learning proficiency. They invited 850 second-year students, who answered a vocabulary-learning questionnaire, and took a vocabulary size test, as well as a college English test. In their study, self-monitoring and selective attention, as well as metacognitive strategies, were found to be significantly correlated with the college English test performance. Vocabulary retention strategies were only correlated positively with vocabulary size test performance. Other strategies--guessing meaning from context, referring to dictionaries, note-taking of new words, skillful use of word formation, contextual encoding, and reviewing newly learned words--were found to be positively correlated with the performance in the two tests. Similar results were also found in another study (Goh & Foong, 1997).

Fan (2003) also focused on the integrated use of vocabulary learning strategies. Her study identified the strategies that are useful for learning vocabulary in general, particularly the strategies that are conducive to learning both high and low frequency words. A group of 1,067 tertiary-level students from seven institutes in Hong Kong took a vocabulary test to measure vocabulary size, as well as a vocabulary learning strategy questionnaire for identifying the strategy profiles of learners in general. Results showed that there was a complexity involved in the frequent use of strategies, and that a discrepancy occurred among the frequency of use, the perceived usefulness, and the actual usefulness of applying vocabulary learning strategies. In another Hong Kong research project, Peacock and Ho (2003) further investigated the strategy use of tertiary-level students. Compensation strategies were found to be the most frequently used strategy, followed by metacognitive, cognitive, memory and affective strategies. Wu's (2008) study also revealed that 10 students in an education program of Hong Kong used a wide variety of metacognitive, cognitive and affective vocabulary learning strategies. Their study reinforced Fan's (2003) findings.

Barcroft's (2009) study attempted to identify strategies used in intentional vocabulary learning, and to assess the correlation between perceived strategies and vocabulary learning proficiency. English-speaking learners of Spanish studied new Spanish words and completed post - tests on vocabulary recall; they then answered a questionnaire about their frequently used strategies. Results revealed a positive correlation between strategy use and that of the target words they recalled. This is in line with Wei's (2007) study, where 60 tertiary-level Chinese students were invited to rate the frequency of their vocabulary learning strategy use on a 5-point Likert scale. The intention was to explore the general pattern of vocabulary learning strategies (e.g., attitudes and beliefs related to use of a strategy), and to measure the effects of self-rated English proficiency on vocabulary learning strategies. The results revealed that English majors frequently used more vocabulary learning strategies than non-English majors. In addition, based on the self-rating, the students were divided into three groups, which were high, intermediate and low English proficiency. The comparison of these groups showed that students with higher English proficiencies used more vocabulary learning strategies than those with lower English proficiencies.

Gu (2010) reported how changes in vocabulary learning strategies are related to the development of vocabulary proficiencies. A group of 100 Chinese EFL students answered a vocabulary learning strategies questionnaire, and completed passive and active tests of vocabulary size. The changes in the strategies were then matched against the changes in the tests of vocabulary size. This study lasted for six months. Results revealed that students who had made progress in passive vocabulary size used more varieties of vocabulary learning strategies more frequently. A negative correlation was only found between vocabulary strategies and active vocabulary at the K1 level. The results of Gu's study reinforced previous findings that vocabulary-learning strategies are an important predictor in vocabulary development.

While the studies mentioned above have advanced our understanding of the learners' strategy use and its importance on language proficiency, some critical issues were not covered. First, the relationship between breadth and depth of vocabulary knowledge has not been measured. Second, the learners' frequency of using different categories of strategies was not determined.

Propositions of its deficiency

Current available EFL autonomy research primarily uses interviews, diary studies, questionnaires to identify the strategies used by the proficient learners. Typically, these are restricted to a handful of advanced ESL speakers in English-speaking countries (Benson, 2007; Cotterall, 2008). While case studies can provide evidence for how frequently strategies are being used by learners, it is difficult to generalize findings from studies with a limited number of advanced learners to larger populations of low-proficiency EFL students. Unfortunately, there seems to be limited studies on addressing low-proficiency learners in an EFL context.

Moreover, although previous studies have focused on the relationship between strategy use and vocabulary proficiency (Lowe, 2009; Su, 2005), there is little convincing empirical evidence that strategy use also directly predicts the learners' vocabulary knowledge. Therefore, there is a pressing need for completing a study to assess strategy use and vocabulary knowledge. Although there is one study focusing on assessing the relationship between strategy use and vocabulary knowledge (Netami et al., 2011), only advanced learners were involved in their study. To the best of the author's knowledge, no study has assessed low-proficiency EFL students in this field.

The purpose of this present study was to explore the degree to which direct and indirect vocabulary learning strategies can predict the breadth and depth of vocabulary knowledge for a Chinese student population measured by widely used standardized tests. The study was designed to address the following questions:

1. What vocabulary strategy do low-proficiency EFL students commonly use?
2. Does the depth of vocabulary knowledge have a higher correlation with strategy use than the breadth of vocabulary knowledge?
3. To what extent are direct and indirect vocabulary learning strategies related to depth and breadth of vocabulary knowledge?

Method

Participants

There were 155 first-year students invited to participate in this study. However, data from 10 participants were removed due to incomplete questionnaires or because they answered all the questions with the same responses; therefore, the resulting number of students eligible to participate in the study was 145. The participants were 46 males and 99 females ranging in age from 19-21 from eight departments in a vocational college in Nanning, China. They were native speakers of Chinese. Although they had studied English for an average of 8 years, their proficiency in English was low according to their scores on the National Matriculation English Test (NMET). This is an official test for entering universities in China. None of the participants have ever studied in a country where English is the official language.
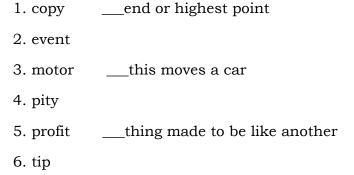
Research Instruments

The present study employed two vocabulary tests and a questionnaire.

Vocabulary tests

The first vocabulary test is a validated version of the Vocabulary Levels Test (VLT, Schmitt et al., 2001), which is used to measure 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, p. 63). In this study, Version 2 was adopted because it was based on the new Academic Word List.

This version has five word levels: 2,000-word level, 3,000-word level, 5,000-word level, 10,000-word level, and a section of academic vocabulary. This test has been utilized in many previous studies (Qian, 2002; Teng, 2014b; Xiang & Fulcher, 2007).

The test format consisted of matching words and word meanings. For example:

1. copy   ___end or highest point

2. event

3. motor   ___this moves a car

4. pity

5. profit   ___thing made to be like another

6. tip

Participants were required to match the three short definitions with three of the six words and they received one point for each correct answer; the maximum possible score was 150 points.

The second vocabulary test was the Word Associates Test (WAT) developed by Read (1993; 2004). As a multiple-choice test format, this test measured depth of vocabulary knowledge. This test format is based on three relationships: paradigmatic (meaning), syntagmatic (collocation), and lexical progression (a process of building words). This test has been utilized in a number of previous studies on exploring the depth of vocabulary knowledge (Nassaji, 2004; Qian, 2002; Teng, 2014b).

The 4.0 version of this test was chosen for this study, which consisted of 40 items that test whether the learners could identify the collocation, synonymous, part-whole, or whole-part relationship between a stimulus word (adjective) and eight options. The eight options were put into two groups, with four being distracters, separated either in the left or right box. An example is:

Savage

| Wild original cruel desolate | dictatorship mess sight canyons |

Participants achieved one point for choosing a correct option. There were four correct options for each target item. The maximum possible score for the 40 items was 160 points.

Questionnaire

In order to investigate participants' strategy use, a 5-point Likert Scale questionnaire was used in this study with options ranging from 'never' to 'always'. The questionnaire was adapted from previous studies (Gu & Johnson, 1996; Netami, et al., 2011; Shimo, 2008). The reliability of the questionnaire calculated by the Cronbach alpha was 0.92.

Considering participants' English proficiency, the questionnaire was prepared in their native language (Chinese), and consisted of two parts. The first part was about demographic information from participants. The second part included 40 vocabulary-learning strategies (See Appendix), which were then grouped into 10 categories of direct and indirect strategies (See details in Table 1).

Procedures

A quasi-experimental study was conducted to gather quantitative data from the 145 participants. Data-collection was done in paper-and-pen format and completed in two sessions. In the first session, the author printed and distributed the questionnaire to the participants. The author administered the questionnaire in person, which was completed in a regular class session at a vocational college in Nanning, China. The participants were told to answer the questions based on their learning experiences and their responses to the questionnaire would not affect their course grades.

In the second session, the two vocabulary tests were administered. Before session two, participants were instructed

about the two vocabulary tests and some examples were provided. The instruction was in Chinese to make sure all the participants understand what they were supposed to do. The two sessions were completed within a total of two hours.

The procedures for collecting and analyzing data were as follows. The author first changed participants' answers of the questionnaire into scores based on the 5-point Likert Scale. In this case, 1 point was awarded for choosing Never, 2 for Rarely, 3 for Sometimes, 4 for Usually, and 5 for Always. The author then analyzed the scores of the two vocabulary tests and the score of the questionnaire with SPSS 19.0. Following this, descriptive statistics, *t*-test, and a two-tailed Pearson correlation analysis were applied and concluded, which are presented in detail in the next section.

Results and Discussion

Results were presented according to the proposed research questions.

Question 1: What vocabulary strategy do low-proficiency EFL students commonly use?

The first step was to calculate the mean scores of vocabulary learning strategies among the 145 participants. This was done to identify the most frequently used strategies among Chinese EFL low proficiency students, which answers the first research question. The results are presented in Table 1.

Table 1: Descriptive statistics of vocabulary learning strategies (n=145)

Categories of strategies	Number of items	Mean	S.D.
Direct memory applying strategy	6, 12, 13, 14, 15	3.77	1.21
Direct cognitive creative strategy	10, 40	3.56	1.32
Direct cognitive practice	7, 9, 11, 37	3.16	1.23
Direct compensation guessing	2, 3, 36	2.82	1.12
Direct cognitive analyzing strategy	4, 16, 20, 32, 34, 39	1.96	0.91
Indirect affective	21, 22, 23, 24, 25, 26, 27, 28, 29	1.86	0.97
Indirect social cooperation	19, 38	1.85	0.99
Indirect metacognitive planning	17, 18, 35	1.75	1.21
Indirect metacognitive monitoring and evaluating	30, 31, 33	1.75	1.12
Indirect cognitive creative strategy	1, 5, 8	1.71	1.23

According to the data in Table 1, it can be concluded that EFL students tend to use more direct vocabulary learning strategies than indirect vocabulary learning strategies. The most frequently used strategy is the direct memory applying strategy. This means that EFL students spend a lot of time in intentionally memorizing words. This may be a reflection of the fact that in the Chinese context, teachers often teach vocabulary to the learners. Consequently, they resort to memory strategies for learning and retaining words. Other frequently used strategies included the direct cognitive creative strategy, direct cognitive practice, and direct compensation guessing. The unexpected results were the infrequent use of direct cognitive analyzing strategies. In addition, EFL students infrequently used indirect strategies. This finding

was consistent with a previous study conducted in Iran (Netami et al., 2011). However, the results of the present study were different from Lawson & Hogben (1996), wherein they reported that very few learners used direct memory strategies. One possible reason might be that the participants in their study were Italian students, and the context in which they learn English might be different from an Asian context. Moreover, the participants in their study were advanced learners. It might be possible for them to have developed helpful vocabulary-learning practices or to choose strategies that were beneficial for their study. However, the participants in this study were low-proficiency students. They might have focused more on vocabulary-learning strategies that involved them in the process of directly memorizing the words.

The next step was to apply a *t*-test for paired samples to analyze whether there was a significant difference between direct and indirect vocabulary learning strategies. The results were shown in Table 2.

Table 2: Paired samples t-test results in the use of the direct and indirect vocabulary strategies

	Mean	S.D.	*t*	df	Sig.
Direct strategies	3.05	1.15	6.15	69	.000
Indirect strategies	1.78	0.99			

The results from Table 2 showed that there was a significant difference in the use of direct and indirect strategies ($p<0.001$). This validated the above-mentioned results in Table 1 that Chinese EFL students used more direct memory applying strategies that are related to remembering and retrieving new information. They particularly depended upon memory strategies in learning new words.

Question 2: Does the depth of vocabulary knowledge have a higher correlation with strategy use than the breadth of vocabulary knowledge?

The second research question was developed to assess the relationship between strategy use and depth and breadth of vocabulary knowledge. The first step was to understand the descriptive statistics of strategy use and vocabulary knowledge. Results are presented in Table 3.

Table 3: Means and standard deviations of vocabulary tests and strategy use

Variables	M	S.D.	N
Breadth of VK	42.31	14.75	145
Depth of VK	29.33	14.77	145
Strategy use	2.41	1.38	145

Table 3 showed that participants achieved a mean score of 42.31 for the breadth of VK while they achieved a mean score of 29.33 for the depth of VK, and participants' mean scores in strategy were not very high (2.41 out of 5). The individual variance in each variable is largely based on the values of the standard deviations.

The next step was to apply the two-tailed Pearson correlation analysis. Results are presented in Table 4.

Table 4: Pearson Correlation (Two-tailed) among Scores on the Vocabulary Tests and Strategy Use

Variables	Breadth of VK	Depth of VK	Strategy use
Breadth of VK	-	.91**	.65**
Depth of VK	.91**	-	.77**
Strategy use	.65**	.77**	-

**Correlation was significant at the 0.01 level

As shown in Table 4, inter-correlations among the scores of the three variables were all statistically significant. The significant correlation between the breadth and depth of vocabulary knowledge was the highest (r=0.91). This result was expected

because both were dimensions of the same construct, i.e., lexical knowledge. In fact, for the learners who possessed a large number of words, they attempted to learn different aspects of the word knowledge. This facilitates them in developing a depth of vocabulary knowledge. This finding is consistent with those of Teng (2014b) and Qian (2002), which indicated that, for learners who knew more words, they could describe a stimulus word in greater depth.

Additionally, the depth of VK has a higher correlation with strategy use (r=0.77) than does the breadth of VK (r=0.65). This provided evidence for the second question that the depth of vocabulary knowledge has a higher correlation with their strategy use than the breadth of vocabulary knowledge.

Question 3: To what extent are direct and indirect vocabulary learning strategies related to depth and breadth of vocabulary knowledge?

To answer the third research question of how direct and indirect vocabulary-learning strategies are related to depth and breadth of VK, a repeated two-tailed Pearson Correlation was applied, and the results are shown in Table 5.

Table 5: Correlation between direct, indirect strategies and depth, breadth of vocabulary knowledge

Variable	Breadth of VK	Depth of VK	Direct strategies	Indirect strategies
Breadth of VK	-	.91**	.51*	.66**
Depth of VK	.91**	-	.58*	.78**
Direct strategies	.51*	.58*	-	.75**
Indirect strategies	.66**	.78**	.75**	-

**Correlation was significant at the 0.01 level, * significant at 0.05 level

As shown in Table 5, overall, all the correlations were higher than 0.50(P<0.05). In the behavioral sciences, a correlation r of

0.50 is generally regarded as indicating a 'large correlational effect size' (Cohen, 1988, p. 80). In other words, high and positive intercorrelations existed among the four variables. Learners' use of direct strategies and indirect strategies had a significant and positive correlation with the depth and the breadth of VK. Moreover, direct strategies had a significant and positive correlation with indirect strategies (r=0.75). The breadth of VK also had a significant and positive correlation with the depth of VK (r=0.91, see also detailed results in Table 4). However, participants' use of indirect strategies had a higher correlation with the depth of VK (r=0.78) and breadth of VK (r=0.66) than the use of direct strategies.

Armed with the above knowledge, it can be implied that (i) the relationship between depth of VK and breadth of VK was found to be significant; (ii) the relationship between indirect strategies and direct strategies was also found to be significant; (iii) the more words the learners knew, the more the learners needed to employ indirect strategies; and (iv) the deeper they knew a word, the more indirect strategies they depended on.

It is evidence that learners with a higher score in VK are more prone to use more indirect vocabulary learning strategies than simply intentionally and repeatedly memorizing new words. This finding is consistent with many previous studies that support a positive relationship between strategy use and language proficiency (Barcroft, 2009; Gu, 2010; Gu & Johnson, 1996). However, this finding runs counter to a previous study (Netami, et al., 2011). In that study, the participants were more advanced EFL students, and it was discovered that the relationship between strategy use and vocabulary knowledge was not only insignificant but also negative. It might be explained that the proficiency level of the students is related to their strategy use. Put simply, learners who are at the low-proficiency level need to resort to different strategies in order to increase the number of words they know. However, for the learners who are at the more advanced proficiency level, they do not need to resort to different vocabulary learning strategies.

 Pedagogical Implications

The present study attempted to identify the most widely used vocabulary learning strategies among Chinese EFL students. The findings suggested that EFL students are prone to use direct strategies for learning and retaining vocabulary. The most frequently used direct strategy was direct memory applying strategies. This was followed by direct cognitive creative strategies, direct cognitive practice, and direct compensation guessing strategies. The least frequently used direct strategy was the direct cognitive strategy of analyzing. Indirect strategies were all infrequently used by the low proficiency EFL students. The order of applying indirect strategies in their learning was indirect affective strategy, indirect social cooperation, metacognitive planning, indirect metacognitive monitoring and evaluating, and indirect cognitive creative strategies.

The relationship between direct and indirect strategies is positively and significantly correlated, as well as their relationship with the depth and breadth of vocabulary knowledge, which was found to be positively correlated in the present study. Additionally, indirect strategies were found to have a stronger correlation with the two dimensions of vocabulary knowledge.

In light of the findings of the current study, it appears necessary that teachers should encourage students to use vocabulary-learning strategies more frequently. The present study highlighted the importance of indirect vocabulary learning strategies, as indirect strategies were significantly correlated with the depth of vocabulary knowledge. It is evident that a higher level of indirect strategies is related to the participants' richness of depth of vocabulary knowledge. As previous studies have revealed depth of vocabulary knowledge has a predictive power in reading comprehension (Qian, 2002), lexical inferencing (Nassaji, 2004), translation (Teng, 2015b), and listening comprehension (Stæhr, 2009), it could be stated with confidence that learners with a higher level of indirect strategies lead to a more proficient English level. However, EFL students in the present study infrequently used the indirect strategies. Hence, teachers should first raise

students' awareness in using strategies. These include not only the direct strategies that some of them have already used, but also those indirect strategies that they seldom use. It is also proposed that making learners aware of the importance of indirect strategies might help them improve their word learning, as well as English proficiency. In this regard, integrating intervention training on metacognitive strategies to learners' current English lessons can be effective in strengthening a learner's ability to use English properly (Nguyen & Gu, 2013).

The results of the present study also revealed that depth of vocabulary knowledge has a positive and significant relationship with breadth of vocabulary knowledge (r=.91). This may be due to the partial construct overlap of the two dependent measures. The test of the breadth of VK measures primary meaning of words, while the test of the depth of VK measures deeper aspects of a word, for example, synonymy, polysemy, or collocation. It may be explained that knowledge in word meaning, in certain cases, has an impact on learning deeper aspects of a word, e,g., knowledge of collocation (Qian, 2002). In addition, this suggests that the development of the two dimensions is probably indeed interconnected and interdependent. Thus it is essential to improve learners' vocabulary size, which contributes to a deeper level of vocabulary knowledge.

However, one thing that must be considered is that the development from breadth of lexical repertoire to depth of lexical repertoire is an incremental process (Schmitt, 2010). This could be attributed to the fact that direct strategies on memorizing one-word-one-meaning are not sufficient in addressing the issue of depth of vocabulary knowledge. Teachers should, therefore, incorporate instructions on how to help students make profitable use of indirect strategies to conduct deeper processing of words, which leads to acquisition of depth of vocabulary knowledge. In addition, teachers should encourage learners to use indirect metacognitive strategies, i.e., self-planning, self-monitoring, and self-evaluating, to manage or regulate their learning both inside and outside the classroom. To do this, teachers could encourage

students to make their learning schedule and design learning tasks and materials. Overall, training should help shift the role from teachers to the learners because students need to take active responsibility for their own vocabulary learning (Nation, 2008).

Conclusion

Many language teachers would agree that, although applying strategies is a good approach for teaching and learning English, it is often ignored in teaching English in an EFL context. This study provided empirical evidence for the relationship between vocabulary learning strategies and vocabulary knowledge through investigating a sample of 145 students in a vocational college in China.

A positive correlation between direct and indirect vocabulary strategies and depth and breadth of vocabulary knowledge was found, which demonstrated that learners with a higher level of vocabulary knowledge tended to conduct effective indirect and direct strategies.

Indirect metacognitive strategies are recommended to be highlighted in teaching and learning vocabulary as it has a stronger correlation with VK. It has ways of helping learners exert more effort in self-control of their learning processes. This training also helps shift the role from teachers to the learners, in which, as stated in Nation's (2008) Four-Strands Approach, the teacher's main job involves planning lessons and training students' vocabulary learning strategies, while the students' main jobs are to take active responsibility for their own vocabulary learning.

Limitations and Future Studies

To conclude, this study has contributed to understanding the relationship between vocabulary learning strategies and vocabulary knowledge, but limitations still exist. First, subjects involved in this study were from the same university; more participants from different levels of education will make this study more inclusive. Second, future studies can add more items into this questionnaire to measure more aspects of vocabulary learning

strategies. Third, although this study recommends the application of indirect strategies in improving learner's depth of vocabulary knowledge, it has not provided any empirical effects of incorporating indirect strategies into English lessons. Future studies on this issue are warranted.

The Author

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Appendix

Autonomous Vocabulary Learning Strategy Use Questionnaire

Directions: This questionnaire attempts to find out the most commonly used autonomous vocabulary learning strategies. All the information will be kept confidential. Please choose the closest answer from the five numbers. Thank you for your cooperation.

Name_____   Gender____
Major _____   Age_____
Have you ever studied in an English-speaking country ___ (Yes/No)

1= Never 2=Rarely 3=Sometimes 4=Usually 5=Always

1. I try to read many reading materials to enlarge my vocabulary out of class. ( )
2. I use logical relations (cause and effect, comparisons and contrast) to guess the meaning of unknown words. ( )
3. I figure out the meaning of unknown words from context. ( )
4. I refer to the dictionary each time when I am not sure about a word. ( )
5. I always encourage myself to speak the newly-learned word in English. ( )
6. I make a list of some difficult words that I easily forget. ( )
7. I pay attention to new words when watching English movies. ( )
8. I take part in many English activities to practice my English. ( )
9. I picture the usage of new words in my mind. ( )
10. I categorize the new words into different groups such as words related to animals, weather, etc. ( )
11. I listen carefully to the teachers when they are explaining new words. ( )
12. I try to remember the words in a context in which it has been used. ( )
13. I repeat the new words frequently. ( )
14. I try to memorize the new words by making it into a sentence. ( )
15. I evaluate what words I have learned after the lesson. ( )
16. When my classmates give their answers, I compare their usage of English with those I have in my mind. ( )

17. I relate the words that I am learning during class to my experiences. ( )
18. Each time when a teacher asks questions, I try to answer the question in my mind. ( )
19. I communicate in English with classmates who have a better command of English. ( )
20. When my classmates speak or write in English, I will think whether I can use better words in my own way. ( )
21. I learn vocabulary because I think it is the core skill of learning English. ( )
22. I learn vocabulary for pleasure or interests in knowing more about English. ( )
23. I learn vocabulary because it can help me understand more reading materials. ( )
24. I learn vocabulary because it can show that I am more proficient in English. ( )
25. I learn vocabulary to help in passing the exam. ( )
26. I learn vocabulary because I want to get a better grade in my studies. ( )
27. I learn vocabulary because I want to achieve academic success. ( )
28. I learn vocabulary because I want to have a wide English vocabulary. ( )
29. I learn vocabulary for the satisfaction in learning a new word. ( )
30. When guessing the meaning of a new word, I try to find examples that help me find out the meaning of that word. ( )
31. I know the words that are important for learning. ( )
32. I learn vocabulary by finding out the contextual clues of the words. ( )
33. I find my mistakes in learning new words and correct them. ( )
34. I learn new vocabulary by consulting the relevant usage of the new words. ( )
35. I set a goal or plan and stick to it for learning new vocabulary. ( )
36. I learn new words by using the word-part clues (prefix, root, suffix). ( )
37. I practice the new words I have learned in writing. ( )
38. I ask teachers or peers the meaning of unknown words. ( )
39. I look at how a certain word is used differently in different contexts. ( )
40. I use online tools to learn new words. ( )