# Effects of EFL Students' Vocabulary Learning Strategies on their Depth of Vocabulary Knowledge

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## ABSTRACT

This article reports on the English study program of Nusa Cendana University, Indonesia to estimate the effect of vocabulary learning strategies on students' depth of vocabulary knowledge. The topic is significant because students are expected to master English vocabularies for they will become English teachers. Unfortunately, their depth of vocabulary knowledge does not develop as well as their vocabulary size. The data gathered using a questionnaire which is based on Schmitt's taxonomy (1997) and word associate test offered by Read (1998). The data were analyzed using multiple linear regression analyses through the use of SPSS. The result of the research shows that in the linear combination, there was a significant effect of all vocabulary learning strategies on students' depth of vocabulary knowledge ($p<0.05$) with contribution effect about 81% ($R2=0.81$). It was also found statistically that, determination, social and metacognitive strategy had significant effects on students' depth of vocabulary knowledge ($p<0.05$) while both cognitive strategy and memory strategy did not significantly affect students' depth of vocabulary knowledge ($p>0.05$). Also, the result shows that determination was the most frequently used strategy while the memory was the least frequently used strategy. Regarding individual items of vocabulary strategies, use the bilingual dictionary to discover the meaning of new English word was the most frequently used strategy while the use of scale for the gradable adjective to consolidate words has been learned was the least frequently used strategy. Taking into account factors affecting vocabulary learning strategies, the result shows that students' proficiency, motivation, belief, and strategy training played a role in students' preference of using certain strategies. At last, the higher the frequency of time in using vocabulary learning strategies, the higher students' depth of vocabulary knowledge.

## KEYWORDS

Vocabulary strategies, depth of vocabulary knowledge, determination, social, memory, cognitive, metacognitive, Indonesia

## INTRODUCTION

To speak about English vocabulary mastery is not only to speak about having large vocabulary size but also having a depth of knowledge of vocabulary. What is meant by a depth of knowledge is "the extent to which the learners have acquired various properties of the word (e.g. its syntactical function and collocations)" (Henriksen (1996) in Ellis 2008, p. 101). Unfortunately, most students' depth of vocabulary knowledge does not develop as well as their vocabulary size. There are researches dealing with learning strategies and the mastery of vocabulary. However, no attention has been given to the effect of vocabulary learning strategies and depth of vocabulary knowledge.

There are some previous studies related to the present research. Hismanoglu (2000) describes some researches related to learning strategies as follows: a study which was the first attempt on learner strategies, entitled the method of inference in foreign language study was conducted by Aaron Carton in 1966. After Carton, in 1971, Rubin started doing research focusing on the strategies of successful learners and stated that once identified; such strategies could be made available to less successful learners. Rubin (1975) classifies strategies regarding processes contributing directly or indirectly to language learning. Wong-Fillmore (1976), Tarone (1977), Naiman et al. (1978), Bialystok (1979), Cohen and Aphek (1981), Politzer and McGroarty (1985), Wenden and Rubin, (1987), O'Malley and Chamot (1990), Conti and Kolody (1998), studied strategies utilized by language learners in the process of learning foreign language . Moreover, researches in the field of depth of vocabulary knowledge have also been conducted such as assessing the roles of depth and breadth of vocabulary knowledge in reading comprehension (Qian, 1999). Plumbing the depths: how should the construct of vocabulary knowledge be defined, conducted by Read (2004), and many other studied the depth of vocabulary knowledge in the field of foreign language teaching.

Regarding aspects of language teaching, language learners, teachers, and researchers agree that vocabulary is an essential element in the process of learning a language (Schmitt, 2008) since words primarily communicate meaning (Vermeer, 2001)

and thus carry the main information load in communication. It matches with Wilkins (1972) who stated that "tiny can be conveyed without grammar, and nothing can be conveyed without vocabulary" (p. 111). Taking into account the importance of vocabulary knowledge and its development, where it is essential for language learners who want to operate at a high level in English to learn thousands of words. Studies indicate that learners must know 98-99% of words in a written text for sufficient comprehension (Hu & Nation, 2000), which means that they need to know 8,000-9,000 word families to be able to read a variety of texts in English (Nation, 2006). Therefore, to master English language, students must pay attention to many aspects of language knowledge such as grammatical structure, vocabulary, and so on, to reach a high degree of competence in English. One of the most important aspects is vocabulary, which plays a great role in English learners' comprehension.

Many studies have been conducted as stated above, but no research investigating the effect of vocabulary learning strategies on a depth of vocabulary knowledge. Also, the mastery of English vocabulary is still unexpected, where most students of English have a lack of depth vocabulary knowledge as seen in Nusa Cendana University which is the only state university in Kupang, the capital city of Nusa Tenggara Timur province, Timor, Indonesia. This university has an English Study Program that is to develop students' English ability for they are expected to be English teachers or other jobs relevant to those who have good English skills. Therefore, this research is crucial that will be a good source of knowledge for developing English students mastery especially their depth of vocabulary knowledge and vocabulary learning strategies. Students will also obtain the benefit of vocabulary learning strategies used in this study, for instance, it can promote some learners to employ some of the listed vocabulary learning strategies in developing their depth of vocabulary knowledge. Besides, the research can be a good source for teachers to help them have a better understanding of how students acquire their depth of vocabulary knowledge. Furthermore, teachers will be able to enhance the students' learning when becoming aware of the number of strategies used by successful and unsuccessful learners. Teachers can identify and initiate vocabulary learning strategies to learners and help them to develop their depth of vocabulary knowledge.

## FRAMEWORK

### 1. Vocabulary Learning Strategies

Beginning the discussion about vocabulary learning strategies, it is important to understand what language learning strategies are. Schmitt (2000) suggests learning strategies as the process by which information is obtained, stored, retrieved, and used. Oxford (1990) proposes that learning strategies are the main factors determining how and how well learners learn L2. She classifies learning strategy into two major groups, namely direct and indirect learning strategies. Direct strategies are involving the target language. It requires mental processing of the language within three domains: memory, cognitive and compensation strategies. These domains do the processing differently for different purposes. The first is memory strategies which refer to how learners remember language. These strategies help learners to store and retrieve new information. The second is cognitive strategies which refer to how learners think about their learning. These strategies enable learners to understand and produce new language by many different means; it is about the manipulation or transformation of the target language by the learner (O'Malley &Chamot, 1990: 44; Oxford, 1990: 43).

Oxford explains further, through her LLS classifications, that it is about the practice to understand and to produce, in any forms, the language being learned, by the using of, mainly, logical thinking (Oxford, 1990: 43-47). The third is compensation strategies which refer to strategies enabling learners to make up for limited knowledge. These strategies allow learners to use the language despite their often large gaps in knowledge (Oxford, 1990: 37). Besides, these strategies facilitate learners to use new languages for either comprehension or production regardless restrictions in knowledge.

Indirect strategies are strategies which support and manage language learning without directly involving the target language (Oxford, 1990: 135). They provide "indirect support for language learning through focusing, planning, evaluating, seeking opportunities, controlling anxiety, increasing cooperation and empathy and other means" (Oxford, 1990: 151). Those mentioned above are classified into metacognitive, affective, and social strategies. The metacognitive strategies, relate to how learners manage their learning. Affective strategies and social strategies refer to those relating to learners' feelings and those which involve learning by interaction with others (Oxford, 1990: 16 - 21). Affective strategies refer to emotions, attitudes, motivations, and values (Oxford, 1990: 140) while social strategies refer to "the social functions of language as a means of communication that require appropriate social applications" (Oxford, 1990: 140).

In a simpler way, O'Malley and Chamot (1990:44) classify language learning strategies into three major types' namely metacognitive, cognitive, and social/affective strategies.

Metacognitive strategies involves strategies for overviewing the processes of language use and learning and for taking steps to plan and regulate those processes efficiently. Cognitive strategies involve the manipulation of information in an immediate task for the purpose of acquiring or retaining that information. Social/affective strategies concern interpersonal relationships and those who deal with controlling one's emotional constraints.

Thus, metacognitive strategies are strategies used to efficiently plan and adjust or regulate processes of language use and learning. Cognitive strategies are used for the purpose of acquiring information by manipulating the information in an immediate task. Social/affective strategies are strategies used which deal with language learners' interpersonal relationship including managing one's emotional constraints.

In a bit difference, Ellis (2008, p. 705) classifies learning strategies according to two taxonomies of learning strategies by O'Malley and Chamot (1990) and Oxford (1990) respectively as follows: the first taxonomy consists of cognitive strategies, metacognitive strategies, and socio-affective learning strategies. Cognitive strategies included analysis, transformation, or synthesis of learning materials. Metacognitive strategies covered an attempt to regulate learning through planning, monitoring,

and evaluating. Socio-affective learning strategies deal with ways in which learners interact with other users of L2. The second taxonomy is direct and indirect strategies. Direct strategies are those that directly involve the target language in the sense that they require mental processing of the language. Indirect strategies provide indirect support for language learning through focusing, planning, evaluating, seeking opportunities, controlling anxiety, increasing cooperation and empathy and other means. Hence, a working definition of language learning strategy is a person's typical approach in gathering information, building knowledge, and developing skills of a language. In this case, language learning strategies deal with how a learner voluntarily uses an appropriate approach to learning a language. Since language learning strategies are related to learners' preference, they are variously used in a large number of strategies. Thus, the large number and variety make them very broad scope to study. To make it simpler, experts have classified them into three main categories namely cognitive, metacognitive, and social/affective strategies.

About language learning strategies, vocabulary as one of the crucial aspects of language acquisition is learned with certain strategies according to the learners' preferences as well. Building on Oxford's categories of language learning strategies, besides cognitive, metacognitive, and social strategies, Schmitt (2000) excludes compensation and affective strategies as the categories of vocabulary learning strategies and introduces another category called determination. The determination strategies were added to account for the cases in which the definitions of new words are distinguished without resort to the knowledge of another person. As a whole, Schmitt's categorization of strategies incorporated two main dimensions: discovery of a new word's meaning and consolidating a word once it has been encountered. The first main category includes determination and social strategies which help the learners discover the meaning of new words while consolidation strategies which comprise social, memory, cognitive and metacognitive strategies are used to retain their vocabulary knowledge.

Learners use Vocabulary Learning Strategies depending on some factors such as motivation, proficiency, and culture (Schmitt, 2000). For example, learners' preferences of using particular learning strategies are affected by motivation. The next crucial factor is to convince the students of the need for strategy training, as a previous study has shown that learners who had not undergone strategy training had performed worse than learners who used their rote-learning techniques (O'Malley &Chamot, 1990, as cited in Schmitt, 2000). Proficiency is also important because novice learners might be restricted to the use of word lists, while advanced learners might guess the meaning of words from the text (Cohen &Aphek, 1981, cited in Schmitt, 2000).

The following is a list of VLS from Schmitt's (1997) taxonomy, consisting of five subcategories in two main categories:
*Discovery Strategies*
Discovery Strategies are used to find meaning of a new word which is included determination strategies and social strategies. Determination strategies are used to facilitate gaining knowledge of a new word by guessing from their fundamental knowledge of the language, guessing from an L1 cognate, guessing from context, and using reference materials. These strategies are individual learning strategies, which help learners to discover the meaning of words by themselves without another person assisting (Schmitt, 1997). Social Strategies are used to find out a word's meaning by working with other people.

*Consolidation Strategies*
Consolidation strategies consist of social strategies, memory strategies, cognitive strategies, and metacognitive strategies. Social strategies engage learners in interaction with their peers, and this helps them to learn from each other, such as observing their classmates and asking their teacher for the meaning of a word (Schmitt, 1997). Memory strategies are strategies, which engage learners in learning new word through mental processing by associating their existing or background knowledge the new word (Schmitt, 1997). For example, if a learner already knows an image of word 'dog' as a four-legged animal from his/her background knowledge, he or she can group the word "dog" under the category of a four-legged animal. Another example is that a learner can guess the name of a sport when he or she watches a particular action from a kind of sports on TV because he/she already remembers the actions associated with that sport. Cognitive strategies do not engage learners in mental processing but are more mechanical. An example is repeating the pronunciation of new words (Schmitt, 1997). Metacognitive strategies are strategies relating to processes involving monitoring, decision making, and evaluation of one's progress. Metacognitive strategies help the learner in determining appropriate VLS for learning new words (Schmitt, 1997).

Considering the previous definitions and classification of vocabulary learning strategies, a working definition of vocabulary learning strategies is learner's typical approach in gathering information, building knowledge, and developing number of vocabulary in a language. Vocabulary learning strategies consist of determination strategies, social strategies, memory strategies, cognitive strategies and metacognitive strategies.

## 2. Depth of Vocabulary Knowledge

The depth of vocabulary knowledge is one of two crucial factors to take into account in vocabulary acquisition besides vocabulary size. As suggested by Ellis, (2008, p. 99), depth of knowledge is considered as one of the factors which constitute vocabulary acquisition. Depth of Vocabulary knowledge has been used to refer to the quality of lexical knowledge, or how well the learner knows a word (Meara, 1996; Read, 1993, 2000). Another definition of depth of vocabulary knowledge is suggested by Henriksen (1996) (in Mukarto, 2005) as the degree of knowledge of words' syntagmatic and paradigmatic relations with other words. Additionally, Henriksen's view on depth of vocabulary knowledge is also adapted by (Ellis 2008, p. 101) as "the extent to which the learners have acquired various properties of the word (e.g. its syntactical function and collocations)". Hence a working definition of depth of vocabulary knowledge is a degree of learners 'knowledge about the meaning of a word lexically, syntactically, and contextually.

Combining experts' studies, Mukarto (2005) classifies the studies of the depth of knowledge according to three approaches in second language acquisition namely binary approach, the developmental approach, and the dimension approach. The binary approach assumes that an L2 word is either known or unknown by an L2 learner. The developmental approach assumes that vocabulary knowledge is partial and incremental in nature and may consist of several levels. The dimension approach to the study of vocabulary acquisition views the vocabulary knowledge as consisting of some dimensions or components.

A way to measure the depth of vocabulary knowledge is called Word Associates Test (Read, 1998). The test provides a stimulus word in a group of words (some are related to the stimulus and some are not). Then the test takers are asked to identify the related words or associates. The assumption of the test is that learners with a deeper knowledge of the word will be better able to pick the associates who should represent different aspects of the meaning of the word than those whose knowledge is more superficial (Read, 1993). Besides, Word Associates Test is a test to measure learners' familiarity with target word meanings and some of their uses as well (Schmitt, et al., 2011).

## OBJECTIVES OF THE STUDY

The main aim of this research is to investigate the effect of EFL learners' vocabulary learning strategies on their depth of vocabulary knowledge. There are five research questions investigated in this research: (1) do all vocabulary learning strategies of students significantly affect their depth of vocabulary knowledge? (2) Does each vocabulary learning strategy of students significantly affect their depth of vocabulary knowledge? (3) Which of students' vocabulary learning strategies significantly contribute to their depth of vocabulary knowledge? (4) What are the most and the least frequently used of vocabulary learning strategies and (5) what factors affecting the most and the least frequently used of vocabulary learning strategy?

## METHODOLOGY

The research is mixed method research where the researcher applied both qualitative and quantitative analyses for solving the research questions. The mixed-method approach is designed in explanatory sequential strategy. The purpose of this sequential explanatory strategy is to "use qualitative results to assist in explaining and interpreting the findings of a primarily quantitative study" (Creswell, 2003: 215); in other words, it used firstly to collect quantitative data and then collecting qualitative data to help explain and elaborate the quantitative results, which in this case is to explain and interpret the effect of students' vocabulary learning strategies towards their depth of vocabulary knowledge. Mixed method, itself, refers to the integration of the two methods mentioned before the quantitative and the qualitative, which may occur during the data collection, data analysis, data interpretation and at some other points of the research (Creswell, 2003: 212).

Thus, both of quantitative and qualitative research were used to gain data for the purpose of this research. In this research, the quantitative data were collected using Vocabulary Learning Strategies Questionnaire (VLSQ) based on Schmitt's (1997) taxonomy and Word Associates Test (WAT) offered by Read (1998), while qualitative data were collected using the unstructured interview. This research is designed as seen in the following figure:
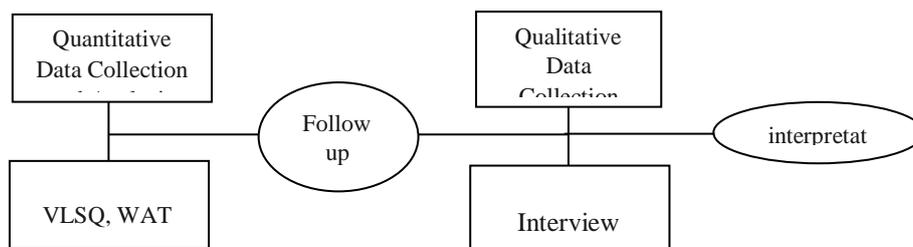


Figure 1. Research Design

### Research Instrument

In measuring students' depth of vocabulary knowledge, the researcher conducted Word Associates Test (WAT) developed by Read (1993, 1998, 2000), accessed from www.lextutor.ca. It measures the depth of vocabulary knowledge using word associations based on three relationships among words in the mental lexicon: paradigmatic (meaning), syntagmatic (collocation), and lexical progression (a process of lexical building). The WAT has been used in some lexical studies to measure a depth of vocabulary knowledge (Nassaji, 2006; Qian, 1998, 2002). The WAT used in this study is found to be reliable, with a coefficient of 0.93, meaning that the instrument is reliable (Read, 1998). The test-taker is required to identify four words related to the target word, so each item has four correct choices.

The WAT consists of two boxes and one stimulus word; each box contains four words. Among the four words in the left box, one to three words can be synonymous to one aspect or the whole meaning of the stimulus words. While among the four words in the right box there can be one to three words that collocate with the stimulus word. Each item has four correct choices. To avoid or reduce the chances of guessing, the words choices are arranged in three possible positions: (1) the left and the right boxes have two correct answers, (2) the left box contains one correct choice, while the right box contains three correct answers. (3) The left box contains three correct answers, and the right box has only one correct choice.
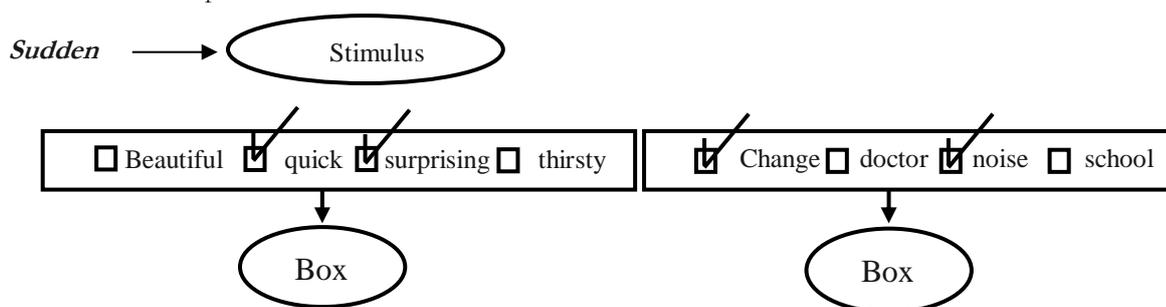
Below is an example of the test:



Figure 2. Word Associates Test Format

On the left box, one to three words (out of four) are synonyms of either the whole meaning of the target word (in this item, sudden) or a component of its meaning. And on the right box, one to three words are collocates of the target word, often occurring together with the target word in a sentence. In this example, the correct answers on the left side are quick and surprising, and the correct answers on the right side are change and noise. So this version of WAT is designed to measure two aspects of the depth of vocabulary knowledge: meaning and collocation. In scoring, one point is awarded for each correctly chosen word. The maximum possible score is 160 as there are 40 items with four correct responses for each.

Besides, the second instrument was Vocabulary Learning Strategies Questionnaire (VLSQ) which is based on Schmitt's (1997) taxonomy. The frequency of use was measured by 5 point Likert scales (1=Never to 5=Always). The questionnaire consists of two questions and 55 items which are categorized into five strategies called determination, social, memory, cognitive, and metacognitive strategy.

The third instrument is the unstructured interview in which the researcher interviewed in depth four students about their vocabulary learning strategies. To avoid bias, the researcher provided an interview guideline focusing on respondents' reasons for preference in using the top 6 of the most and least frequently used of vocabulary learning strategies. Besides, the researcher used a video recorder of a smart phone and a digital camera to record the interview processes and to take some pictures.

The researcher gathered data of the research from the fourth semester students of English Study Program of Nusa Cendana University who participated on a voluntary basis. There were total 42 students gathered from two classes. Since the population is a small number of size, the researcher decided to work with total sampling. The sample was chosen purposively based on criteria; the fourth-semester students, and have already passed vocabulary subject. Thus all the 42 students consisting of 13 male students and 29 female students of the population were chosen for the purpose of this study.

**Data Analyses**

Data analysis was designed into some phases with different purposes. The data were collected using vocabulary learning strategies questionnaire and depth of vocabulary knowledge test. The data were analyzed using standard multiple regression analysis to know the effect of vocabulary learning strategies (DET, SOC, MEM, COG, and MET) on students depth of vocabulary knowledge.

The first phase, the researcher conducted three requisite analyses to test three required assumptions in multiple regression analyses namely, collinearity, normal distribution, and homoscedasticity. The second phase, R2 and significant value of F test were used to test the first hypothesis, significant values of t test were used to test the second hypothesis, and all B values of variables were used to test the third hypothesis. In answering the fourth questions, descriptive statistics included means scores were used. The last question was answered by interpreting interview result. All the process of statistical analysis were carried out using SPSS and those statistical analyses were carried out for testing the three hypotheses in this study. The hypotheses were tested to know that they are rejected or not by comparing the result of statistical analyses, in this case, significance values of t and F to the level of alpha ($\alpha$=0.05, and $\alpha$=0.01 ), while the qualitative data were interpreted to complete the quantitative data.

## RESULTS AND DISCUSSION

**Quantitative Data**

*The Effect of All Vocabulary Learning Strategies (DET, SOC, MEM, COG, MET) on Students' Depth of Vocabulary Knowledge.*

Table 1. Model Summary

| Model Summary[b] | | | | |
|---|---|---|---|---|
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
| 1 | .900[a] | .811 | .784 | 3.679 |

a. Predictors: (Constant), MET, SOC, COG, MEM, DET

b. Dependent Variable: DVK

Table 1 describes R value which shows a multi relationship between dependent and independent variables of this study. The R value is 0.90 which means that the relationship or correlation between independent variables (DET, SOC, MEM,

COG, MET) and dependent variable (DVK) was about 90 %. R Square and adjusted R-square values describe the effect contribution of independent variables on a dependent variable. Accordingly, those values indicate that approximately 81 % (R square = 0.81) or 78 % (adjusted R square = 0.78) students' depth of vocabulary knowledge were affected by their vocabulary learning strategies.

Table 2 describes the significant value of F test (sig) which is used to determine whether the first hypothesis of this study is rejected or not.

Table 2. ANOVA Test Result

| ANOVA[b] | | | | | | |
|---|---|---|---|---|---|---|
| | Model | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 2087.703 | 5 | 417.541 | 30.848 | .000[a] |
| | Residual | 487.273 | 36 | 13.535 | | |
| | Total | 2574.976 | 41 | | | |
| a. Predictors: (Constant), MET, SOC, COG, MEM, DET<br>b. Dependent Variable: DVK | | | | | | |

From anova table (table 2), the first hypothesis can be tested by comparing significant value of F test (sig) and level of $\alpha$ = 0.01 (degree of trustworthiness = 99 %).

- Hypothesis:

$H_{01}$: All vocabulary learning strategies of students do not collectively affect their depth of vocabulary knowledge.

$H_{a1}$: All vocabulary learning strategies of students collectively affect their depth of vocabulary knowledge.

- Level of $\alpha$ = 0.01
- $H_0$ is accepted if significant value of F test (sig) < level of $\alpha$
- Result :
  sig = 0.00 < $\alpha$ =0.01

The result shows that sig value of F test (sig =0.00) is lower than $\alpha$ =0.01

- Null hypothesis is rejected and alternative hypothesis is accepted.

Since, null hypothesis is rejected, it can be concluded that in the degree of trustworthiness 99 % ($\alpha$ = 0.01), collectively, all vocabulary learning strategies of students, significantly affected their depth of vocabulary knowledge.

*The Effect of Each Vocabulary Learning Strategy (DET, SOC, MEM, COG, MET) on Students' Depth of Vocabulary Knowledge.*

This part describes effects of each vocabulary learning strategy on their depth of vocabulary knowledge. To see the effects of each vocabulary learning strategies on the depth of vocabulary knowledge, partial regression coefficient table (table 3) consisting of significant values of t test (sig), is presented to test hypothesis 2, hypothesis 3 and to answer research question 2.

Table 3. Partial Regression Coefficient

| Coefficients[a] | | | | | |
|---|---|---|---|---|---|
| | Unstandardized Coefficients | | Standardized Coefficients | | . |
| Model | B | Std. Error | Beta | t | Sig |
| 1 (Constant) | -6.595 | 6.334 | | -1.041 | .305 |
| DET | .415 | .142 | .360 | 2.915 | .006 |
| SOC | .239 | .112 | .233 | 2.139 | .039 |
| MEM | .020 | .119 | .018 | .165 | .870 |
| COG | .084 | .080 | .112 | 1.052 | .300 |
| MET | .287 | .100 | .339 | 2.861 | .007 |
| a. Dependent Variable: DVK | | | | | |

- Hypothesis

$H_{02}$: Each vocabulary learning strategy of students does not significantly affect their depth of vocabulary knowledge.

$H_{a2}$: Each vocabulary learning strategy of students significantly affects their depth of vocabulary knowledge.

- Level of $\alpha$ = 0.05
- Test criteria:

Accept $H_0$ if sig > $\alpha$

Reject H$_0$ if sig < α

- Results:

*The effect of DET on DVK*

Sig = 0.006

Since sig= 0.006 < α = 0.05, conclusively, in the degree of trustworthiness 95%, determination strategy had a significant effect on students' depth of vocabulary knowledge.

*The effect of SOC on DVK*

Sig = 0.039

Since sig= 0.039 < α = 0.05, conclusively, in the degree of trustworthiness 95%, social strategy significantly affected students' depth of vocabulary knowledge.

*The effect of MEM on DVK*

Sig = 0.870

Since sig= 0.870 > α = 0.05, conclusively, in the degree of trustworthiness 95%, memory strategy had no significant effect on students' depth of vocabulary knowledge.

*The effect of COG on DVK*

Sig = 0.300

Since sig = 0.300 > α = 0.05, conclusively, in the degree of trustworthiness 95%, cognitive strategy had no significant effect on students' depth of vocabulary knowledge.

*The effect of MET on DVK*

Sig = 0.007

Since sig = 0.007 < α = 0.05, conclusively, in the degree of trustworthiness 95%, metacognitive strategy had a significant effect on students' depth of vocabulary knowledge.

- Conclusion:

Partially or individually, in the degree of trustworthiness 95%, there were three strategies that significantly affected students' depth of vocabulary knowledge of this study. They were determination, social, and metacognitive strategy (p<0.05), while the other two strategies, memory and cognitive strategy did not significantly affect students' depth of vocabulary knowledge of this study (p>0.05). Thus, hypotheses 2, hypothesis 3, and research question 2 are confirmed.

*Kinds of Vocabulary Learning Strategies which Significantly Contribute to Students' Depth of Vocabulary Knowledge.*

Table 4. B Values of Each Strategy

| Coefficients[a] | | | | | |
|---|---|---|---|---|---|
| | Unstandardized Coefficients | | Standardized Coefficients | | . |
| Model | B | Std. Error | Beta | T | Sig |
| 1 (Constant) | -6.595 | 6.334 | | -1.041 | .305 |
| DET | .415 | .142 | .360 | 2.915 | .006 |
| SOC | .239 | .112 | .233 | 2.139 | .039 |
| MEM | .020 | .119 | .018 | .165 | .870 |
| COG | .084 | .080 | .112 | 1.052 | .300 |
| MET | .287 | .100 | .339 | 2.861 | .007 |
| a. Dependent Variable: DVK | | | | | |

DVK = -6.595 + (0.415) DET + (0.239) SOC + (0.020) MEM + (0.084)COG + (0.287)

It has been shown and stated that among five strategies of vocabulary in this study. There were three strategies that partially or individually had significant effects on students' depth of vocabulary knowledge, they were determination, social, and metacognitive strategy, and there were two strategies that did not significantly affect students' depth of vocabulary knowledge consisting of memory and cognitive strategy. However, contributions of each strategy and how well those strategies predicted students' depth of vocabulary knowledge were not described yet. Therefore, B values of each variable in partial regression coefficient table (table 4) are used to be interpreted based on regression equation as follows:

Thus, this regression model can be interpreted as follows: When vocabulary learning strategies (DET, SOC, MEM, COG, MET) are constant, students' depth of vocabulary knowledge (DVK) score is -6.595. This means that without effect or influence of vocabulary learning strategies, DVK score is -6.595. In other words, if students do not use vocabulary learning strategies, students DVK score will be -6.595. If DET increases by 1 point and other strategies are constant, DVK will increase

by 0.415. If SOC increases by 1 point, and other strategies are constant, DVK will increase by 0.239. If MEM increases by 1 point and other strategies are constant, DVK will increase by 0.020. If COG increases by 1 point and other strategies are constant, DVK will increase by 0.084. If MET increases by 1 point and other strategies are constant, DVK will increase by 0.287.

Looking at B scores of each strategy, it can be determined what strategy had the highest contribution on students' depth of vocabulary knowledge of this study. Table 4.6 shows that DET is the highest B value (B = 0.415), so, compare to the other four strategies (SOC, MEM, COG, MET), DET was the strategy that had the highest contribution. And was the best predictor of depth of vocabulary knowledge of this study, thus, hypothesis 3 and research question 3 are confirmed.

*The Most and the Least Frequently Used of Vocabulary Learning Strategies*

To describe the most and the least frequently used of vocabulary learning strategies of English Study Program students of Nusa Cendana University, descriptive statistics table including mean and rank scores are presented as shown in Table 5.

Table 5. Descriptive Statistics Table

|  | N | Minimum | Maximum | Mean | Std. Deviation | Rank |
|---|---|---|---|---|---|---|
| DET | 42 | 56 | 82 | 71.5 | 6.865 | 1 |
| MET | 42 | 36 | 84 | 65.52 | 9.348 | 2 |
| SOC | 42 | 50 | 80 | 65.45 | 7.728 | 3 |
| COG | 42 | 37 | 89 | 62.83 | 10.597 | 4 |
| MEM | 42 | 44 | 78 | 58.86 | 7.334 | 5 |
| Valid N (listwise) | 42 |  |  |  |  |  |

Based on mean scores of each strategy on table 5, DET is the highest mean score (mean= 71.5) and MEM is the lowest mean score (Mean = 58.8). This shows that the most frequently used of vocabulary learning strategy of English Study Program students of Nusa Cendana University was determination strategy, while the least frequently used strategy was memory strategy.

**Qualitative Data**

To support quantitative data of this study, the researcher conducted an unstructured interview. Which was to ask in depth four respondents about their vocabulary learning strategies considering reasons of why they preferred to use strategies categorizing as top 6 frequently used strategy and why they did not prefer to use strategies categorizing as top 6 frequently use strategy in this study. The first interviewee in this study was a user of the top 6 most frequently used strategies. She was enthusiastic and eager to know why she was chosen as an interviewee. She was also curious about how the interview process would be like. The researcher then gave her the information needed, and we met to conduct the interview. The second interviewee is a male student, and he was chosen randomly for the purpose of the research. He was also a very enthusiastic student and happy to be a respondent of this study. The third respondent was also chosen randomly, and he is a male student who felt free to help the researcher any time if needed. The last interview was a user of top 6 of the least frequently used VLS.

By coding the qualitative data, 4 themes appear as factors which affect the most and the least frequently used of vocabulary learning strategies of English Study Program students of the University of Nusa Cendana. These factors are described respectively as follows:

*Students' Proficiency*

The first factor which influences the use of the strategies is students' proficiency. As seen in the following data coding, the awareness of their proficiency seems creating students' hesitation in using certain strategy.

7) R3 **: I seldom speak with native speaker, because it is rare to find them, and even though we meet them, I am afraid. Hehehe (lough).**

R : Why are you afraid?

R3 *: **I am afraid if my English is wrong, I am afraid if my pronunciation is not clear, that will make them confused, hehehehe (laugh).***

11) R : what about talking with native speaker? Have you ever talked with them?

R4 *: **I have talked for once, but it was just for greeting like saying good morning.***

R : Just like that? Only once?

R4 *: **Yes, because it is difficult to find native speaker, and if I met them, I was afraid.***

R : What is your difficulty in learning English?

R4 : **ummmm.. structure. Its grammar**

**R : What's the problem with grammar**

**R4 : it is difficult to make a sentence for we have to think about the grammar.**

Respondent 3 and 4 are not confident enough to use strategy "talking with native speaker" because they realize that they do not have enough vocabulary to have a conversation with native speaker. In addition, respondent 4 finds it is difficult to create sentences because of grammar consideration. This is the cause of the lack use of the strategy. Students' lack of proficiency limits them to use the strategy.

*Students' motivation*

The next influencing factor is students' motivation. The student seems lose her motivation in using the strategy because of the difficulty of the strategy.

14) R       : what about using scale for gradable adjectives? For example, huge/big/medium-sized/small/tiny

R4 : seldom

R    : It is also because you have never been taught?

*R4* : **I have been taught, once. But it is difficult to learn like that. It's complicated**

Respondent 4 admitted that she was exposed to *use scale for gradable adjective* before. However, since it was only taught once and it seemed complicated, then he rejected to use the strategy. The respondent had no motivation in using the strategy because there was no more exposure to the strategy which ensure her that it is a good strategy to be implemented in learning vocabulary.

Other students show different facts related to their motivation in using VLS as seen in the data coding below.

3)R2      : Hahahaha (laugh) not really. **I am happy to sing and enjoying it if we have memorized the song lyric. Not all songs, I only like song with nice music and easy to be listened and memorized**

Respondent 2 (R2) was motivated to *use English language media* in learning vocabulary because he likes singing and watching movies. The interest in those things motivated the student to enrich his vocabulary knowledge. Convincingly, it is proven that motivation plays important role in the use of VLS.

2) R2    : Well, actually I didn't have experience in learning English before, but when I learn English, I am happy, **because I want to be an English teacher**

Besides being interested in singing and watching film, respondent 2 also wants to be an English teacher. This passion motivates him to study vocabulary through attractive way that is using English media. Hence, motivation has great role in influencing the student to choose the strategies.

*Students' Beliefs*

As seen in the data below, the students' use of strategy depends on their beliefs on the strategy.

1) R: What dictionary do you use? Bilingual or monolingual?

R1  : Bilingual. I seldom use monolingual

R    : What's the problem?

R1 *:* **Because I usually learn by translating the word from English into Indonesian. So it's better to use bilingual dictionary.**

3) R2     : **because I need to translate it into Indonesian to make it easier)**

5) R: Using monolingual dictionary?

R2  : never

R    : why?

**R2 : Because it contains only English translation, while I have to learn by translating English into Indonesian so that I can understand.**

Respondent 1 and 2 use bilingual dictionary to study English vocabulary because they believe that learning by translating is easy. By transfering English words into Indonesian and vise versa, the students find it simple to enrich their vocabulary knowledge. This is the reason why bilingual dictionary is mostly chosen.

14) *R4*     : **I have been taught, once. But it is difficult to learn like that. It's complicated**

Respondent 4 does not use *scale for gradable adjective strategy* because to him, this strategy is complicated. Believing that this strategy is complicated, then respondent 4 reject to use the strategy. This is the cause of the rare use of *scale for gradable adjective*.

*Strategy Training*

The last influencing factors is strategy training. Strategy training is related to how the students are exposed to the way of using the strategies. It seems that the student got very limited exposure to strategy training.

4) R3     : No. It's just making word list. I never group the words spatially like that

R    : Why? You don't like to learn using that strategy?

R3  : **I never know how to learn like that. I just know it right now**

10)R     : I would like to ask you if you use physical action when learning a word, for example, learning word *throw* while doing a *throw* action

R4 : No. I never do that

R    : Never?

R4  : yes. Never

R    : Why? It seems that you don't like to learn in that way

R4 : **I never know how to learn like that and I never think that there is a learning strategy like that.**

In the opposite, another student show different fact as seen in the following data coding.

R : showing an example of semantic map

R3 : Always. **Because it has been taught when I was in senior high, we called it mind map,** the example is like that, so if want to learn about transportation, it consists of land and air. Then, land transportation consists of bus, while air transportation consists of airplane, etcetera.

The student uses semantic mapping strategy because he has been taught about the strategy when he was in senior high school. Seeing these facts, it can be stated that strategy training is implemented unequally. Some students may use the strategy because they have known about that but others may not because they do not even get any information about the strategy. Here teachers' role is crucial to take into account. Not only to introduce the strategy to the students once, but also to implement it continuously so that the students may get accustomed to the strategy.

## RESULTS AND DISCUSSIONS

The major goal of this study was to test the effect of students' vocabulary learning strategies on their depth of vocabulary knowledge. In the light of result of statistical analyses, in degree of trustworthiness 99% ($\alpha$=0.01), significant effect of all VLS (DET, SOC, MEM, COG, and MET) on students depth of vocabulary knowledge was found and proved. This means that when all of VLS were used collectively or in linear combination, students' depth of vocabulary knowledge was significantly affected. Statistically, the effect explained the depth of vocabulary knowledge was about 81 % ($R^2$=0.81) which means that all the strategies affected students depth of vocabulary knowledge about 81%. This result seems to be congruent with a study conducted by Shirazi and Yamini (2011) to 130 senior students at Marvdasht Azad University, Iran. Their study shows that there were a significant relationship and effect between depth of knowledge and vocabulary knowledge of less lexical group and lexical group students.

Regarding the effect of each vocabulary learning strategy on students' depth of vocabulary knowledge, the result indicates that individually, in the degree of trustworthiness 95 % ($\alpha$=0.05) there were three strategies that significantly affected students' depth of vocabulary knowledge namely determination, social, and metacognitive strategy. While memory strategy did not significantly affect students' depth of vocabulary knowledge neither did cognitive strategy. Moreover, determination strategy which was also found as the most frequently used strategy had the highest contribution and thus as the strongest predictor to the depth of vocabulary knowledge in this study. This is to show that students who used determination strategy to discover meaning of a new English word were better at a depth of vocabulary knowledge mastery than those who did not use determination strategies. Besides, the result of regression model shows that all of the vocabulary learning strategies (DET, SOC, MEM, COG, MET) have positive effect on students depth of vocabulary knowledge. Even though memory strategy and cognitive strategy did not significantly affect students' depth of vocabulary knowledge; they were found to have positive effect on the depth of vocabulary knowledge as well. Positive effect indicates that all five strategies in this study had the contribution to developing or to increase students' depth of vocabulary knowledge.

Furthermore, the result showing that determination was the most frequently used strategy is consistent with a prior study conducted by Amirian and Heshmatifar at Hakim Sabzevari University in Iran (2013). Unlikely, their study seems to be different with this study about the least frequently used strategy. They found that social strategy was the least frequently used strategy while in this study memory strategy is reported as the least frequently used strategy. The plausible reason behind this issue is that students in the current study had a lack of proficiency of memory strategy and as a result, there were three items of memory strategy standing as top three of top six the least frequently used strategy and two items standing as rank 5 and 6. This idea is supported by Schmitt (2000) who stated that one of the factors that may affect whether learners will use vocabulary learning strategies or not is students' proficiency.

Interestingly, determination strategy that is considered as the most frequently used of VLS, significantly affected students' depth of vocabulary knowledge. Besides, determination strategy was also found statistically to be the strongest predictor among three strategies (DET, SOC, MET) that significantly contributed to students' depth of vocabulary knowledge. This result shows that students preferred to discover meaning of words by themselves without others support, such as using bilingual dictionary (Indonesian-English/English-Indonesian dictionary) and monolingual dictionary (English-English dictionary). Students preferred to use dictionary because they found it was easier to discover a new English word meaning without spending time to ask others. They also felt that finding the word meaning in Indonesian will make it easily understood.

On the other hand, memory strategy which is considered to be the least frequently used of VLS had no significant effect on students' depth of vocabulary knowledge. Students felt that it was difficult for them to use some strategies categorized as memory strategy such as use scale for gradable adjective, use semantic map, use semantic feature grid, and use physical action when learning a word to consolidate word they have learned, for they have no background knowledge and skill of using these strategies. It matches with Nation (2011) who states that learners are very different in the proficiency that they apply strategies with. Thus language learners should be trained in use of vocabulary learning strategies. Conclusively, lack of proficiency was a factor causing memory strategy became the least frequency used strategy in this study. Besides, since this strategy was rarely used, students' depth of vocabulary knowledge was not significantly affected.

Besides students' proficiency, there were other factors such as motivation, belief, and strategy training that also played a role in students' preferences of using certain vocabulary learning strategies. For one thing, students need to have proficiency of how to use certain strategies and need to have background knowledge of those strategies. Therefore, strategy training with the help of teachers will help students have adequate knowledge and proficiency of vocabulary learning strategies. The

problem is students were not trained enough to use the vocabulary learning strategies; this can be due to a lack information for teachers of what and how to use those strategies. Thus, it can also be assumed that teachers were not familiar with vocabulary learning strategies and depth of vocabulary knowledge which resulted on lack of strategy training to students. Therefore strategy training is a very crucial factor to help students to master vocabulary learning strategies. This will also help students to have a positive belief about their ability and benefit of using the strategies to the development of their depth of vocabulary knowledge. Also, when students had positive belief about their vocabulary learning strategies, the level of time frequency in using the strategies would be increased, and when the strategies were frequently used students' depth of vocabulary knowledge is considered to be increased. In the same way, frequency of use of students' vocabulary learning strategies would be increased if students had high motivation.

As a result, the more frequent the use of vocabulary learning strategies, the higher the score of depth of vocabulary knowledge would be. Consequently, students have to use vocabulary learning strategies as often as possible. For this reason, to develop and increase the mastery of students' depth of vocabulary knowledge, students have to use their vocabulary learning strategies as often as possible. And to increase the frequency of time in using vocabulary learning strategies, students' proficiency, belief, motivation, and strategy training need to take into account.

## CONCLUSIONS

There was a significant effect of all vocabulary learning strategies on the depth of vocabulary knowledge of English study program students of Nusa Cendana University. It is statistically proved that in the degree of trustworthiness 99% or level of alpha=0.01, collectively or in linear combination, these strategies had significant effect about 81% of students' depth of vocabulary knowledge.

Partially or individually, in the degree of trustworthiness 95% or level of alpha=0.05, there were three strategies that significantly affected students' depth of vocabulary knowledge of this study. They were determination, social, and metacognitive strategy, while the other two strategies, memory, and cognitive strategy did not significantly affect students' depth of vocabulary knowledge. Determination strategy was the strongest contributor and is considered as the best predictor to students' depth of vocabulary knowledge. However, it doesn't mean that the other four strategies didn't have any contribution to the depth of vocabulary knowledge for they were also found to have positive effects in increasing students' depth of vocabulary knowledge.

Determination strategy is also considered as the most frequently used strategy by English study program students of Nusa Cendana University. While the least frequently used strategy was memory strategy. Schmitt states (1997) this strategy is individual learning strategy that helps learners to identify the meaning of new words without other's help. This can be the reason of why this strategy was the most frequently used strategy. Easily accesses to the internet to find learning resources and the use of smart phone with electronic dictionary make students become independent learners. They can individually solve their learning problems without others' help. While memory strategies were least frequently used because students did not have enough comprehension about the strategy, and lack of background knowledge about the word they would like to learn.

Using bilingual dictionary which is a kind of determination strategy was the most frequently used strategy for discovering a new English word. While using scales for gradable adjective which is a kind of memory strategy was the least frequently used strategy for consolidating word that has been learned.

There were 4 factors influencing the most and the least frequently used of vocabulary learning strategies, namely students' proficiency, motivation, belief, and strategy training. Students with high proficiency of English and vocabulary learning strategies preferred to use vocabulary learning strategies as often as possible. In such a way, students with high motivation to learn English are considered to use vocabulary learning strategies in a higher frequency of time, and vice versa. Moreover, students' frequency of time in using vocabulary learning strategies was also affected by students' belief for the reason that positive belief of vocabulary learning strategies was found to increase students' frequency of time in using those strategies. Besides, strategy training also played role on students' frequency of time in using vocabulary learning strategies.

The more frequent the use of vocabulary learning strategies, the higher the score of students' depth of vocabulary knowledge. Therefore, students have to use vocabulary learning strategies as often as possible for the development of their depth of vocabulary knowledge, and to increase the frequency of time in using vocabulary learning strategies, students' proficiency, belief, motivation, and strategy training need to take into.

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