

Strategies for Learning Vocabulary

Employed by Science-Oriented Students: A Qualitative Perspective

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Abstract:

Vocabulary learning strategies for the present investigation have been defined as any set of techniques or learning behaviors, which science-oriented students reported using in order to discover the meaning, and to retain the knowledge of newly-learned words. The present investigation has been designed to explore vocabulary learning strategies reported to be employed by science-oriented university students in Northeast Thailand. The subjects of the study were 133 science-oriented students sampled on the basis of convenience and availability. An open-ended strategy questionnaire and a semi-structured interview were used as the main methods for the data collection. The data obtained were analyzed qualitatively in response to the purpose of the investigation.

The findings of the research show that three different emergent categories have been reported which include 1) the strategies to discover the meaning of new vocabulary

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items; 2) the strategies to retain the knowledge of newly-learned vocabulary items; and 3) the strategies to enhance their learning vocabulary items or to expand their knowledge of vocabulary. However, for the purpose of this paper, only the first two categories have been taken into consideration. Lastly, the implications of the research findings for the teaching and learning of English for science-oriented students are also discussed.

Keywords: Vocabulary learning strategies, Science-oriented students

Introduction

Much research in the field of language learning and teaching over the past three decades has looked at the relationships between characteristics of language learners and their language performance. The priority of the investigation, especially in the 1980's, seemed to focus on how language learners dealt with their target language learning. Very often, the dichotomous term used to describe language learners is either 'good/poor' or 'successful/unsuccessful'. Many researchers have investigated a series of factors basically hypothesized to have a relationship with how language learners go about learning a foreign language. These factors include learner's foreign language experience, gender, field of study, status of the target language, or ethnicity. These early investigations inspired some researchers in the field to attempt to identify what language

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learners, especially those who are ‘good’ or ‘successful’ actually do when they learn a foreign language. The first attempts to scrutinize such good learner behaviors which were empirically evidenced, were carried out by Stern (1975), and Rubin (1975). Shortly after the lists of characteristics of good language learners had been proposed by both Rubin and Stern, more researchers started to turn their attention to investigate learning strategies of good language learners. Examples are Politzer (1983); Chesterfield and Chesterfield (1985); O’Malley *et al* (1985); Ramirez (1986); Oxford (1989), and more recently Campbell (1990); Embi (1996); Ely (1998); Halbach (2000); Davis-Wiley (2000); Intaraprasert (2000, 2003); Markham (2001); Prakongchati and Intaraprasert (2008) and Sriboonruang and Intaraprasert (2010).

With regard to vocabulary learning strategies very little empirical research has been carried out exclusively to investigate what types of learning strategies students employ in order to deal with learning foreign language vocabulary (e.g. Stoffer, 1995; Schmitt, 1997; Kudo, 1999; Gu and Johnson, 1996; Gu, 2002; Siriwan and Intaraprasert, 2007). This has been pointed out by Schmitt (1997, p. 199) “...vocabulary learning strategies- has attracted a noticeable lack of attention.” In the context of Thailand, no empirical research has been carried out exclusively to investigate how university students particularly those who are science-oriented deal with new vocabulary items. Since

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science-oriented students have to partly deal with English for science and technology (EST), reading seems to be the dominant skill as pointed out elsewhere in Intaraprasert (2000). Consequently, vocabulary has played an important role in their English language learning. The present investigation aims to fill this gap. The researcher decided to undertake an exploratory investigation designed to examine types of strategies science-oriented university students reported employing in order to deal with new vocabulary items based on an open-ended questionnaire and a semi-structured interview. This investigation was descriptive-interpretative in nature rather than confirmatory, hypothesis-testing, or as termed by Skehan (1989) and Larsen-Freeman and Long (1991), it employed the ‘research-then-theory’ rather than the ‘theory-then-research’ format (cf. Graham, 1997). To put it simply, this investigation was not intended to reconfirm any theories or hypotheses about students’ use of strategies in order to acquire new vocabulary items in English. Rather, it was designed to examine types of vocabulary learning strategies of science-oriented university students in Thailand.

Research Questions

Based on the review of literature, the research questions can be formed. The present investigation attempts to explore the vocabulary learning strategies employed by science-oriented students learning English. In order to establish some empirical data in the

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context of language learning of science-oriented university students, the present investigation is designed to answer the following specific questions:

1. What types of strategies do science-oriented students employ in order to deal with new vocabulary items? and
2. What are the implications of these research findings for the teaching and learning of English for science-oriented students?

Characteristics of the Research Subjects

Table 1 : Number of Students by ‘Perceived’ English Language Ability; Gender; and Field of Study

‘Perceived’ Language Ability	Poor	Fair	Good/very Good	Total
	69	64	--	133
Gender	Female	Male	Total	
	74	59	133	

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Field of Study	Engineering	Agricultural Technology	Public Health	Information Technology	Total
	77	18	24	14	133

The characteristics of the research subjects can be summarized as follows:

- The number of students perceiving or rating their English language ability as ‘fair’ is slightly smaller than those perceiving their language ability as ‘poor’. No students perceived their language ability as ‘good/very good’.
- The number of female students is slightly larger than the number of their male counterparts.
- The number of engineering students is larger than those studying in the other major fields of study while the number of agricultural technology students is the smallest.

Data Collection and Data Generation Methods

In collecting the data to answer the research questions for the present investigation, the researcher posed three open-ended questions to the subjects of the study as the guide for them to provide information about their vocabulary learning strategies, i.e. when encountered with new vocabulary in a lesson, how would you deal with it in order to

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learn such a new word? Apart from these three open-ended questions, the participants were requested to provide the researcher with their gender, their 'perceived' language ability and their field of study. The researcher made every attempt to ensure the readiness of everything for when the data collection started. When meeting with students, the researcher started the classroom process by briefing them on the purpose of the data collection and the use of the outcome of this investigation. The students were asked to look through the questions and they were allowed to ask about any questions that they did not understand. The students were asked to think about the responses to the questions outside class time and hand in their responses the following day to the researcher's office. Out of 133 students, fifteen were interviewed in order to elicit more information about their vocabulary learning strategies. However, it was found that the data obtained through the interviews did not yield different results from those obtained through the open-ended questionnaire. The data obtained through both the written open-ended questions and interviews were then processed and analyzed qualitatively and in part, the coding system suggested by Lawson and Hogben (1996) was used to help analyze the data and categorize the emergent strategies.

To sum up, initially, the researcher looked carefully through the responses to the written questionnaires provided by 133 students and interviews by 15 students,

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attempting to find the common characteristics of the reported statements such as learning behaviors and a purpose of using such learning behaviors. It emerged that most of the statements which could be regarded as ‘vocabulary learning strategies’ were reported by students in order to achieve a particular learning purpose, identified later as to discover the meaning of new vocabulary items, to retain the meaning of newly-learned words and to enhance their vocabulary learning. The process of classifying these reported learning behaviors or strategies together with purposes of using certain learning behaviors was iterative. Moreover, the researcher had to reconsider different aspects of the classification, for example, terms used to identify purposes of strategy use and labels to identify strategies as the whole system, several times in order to reach a satisfactory classification.

Results and Discussion

- **What types of vocabulary learning strategies were reported being employed by EST students at Suranaree University of Technology?**

In response to the research question posed to the participants, the result of the data analysis has revealed that altogether 21 individual vocabulary learning strategies have

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been reported being employed by the participants in order to achieve two different purposes when encountering new vocabulary items especially those for the classroom lessons. Two main purposes of strategy use can be preliminarily classified. They are for classroom lessons. They are: 1) to discover the meaning of new vocabulary items comprising ten individual strategies; and 2) to retain the knowledge of newly-learned vocabulary items comprising eleven strategies. In classifying vocabulary learning strategies for the present investigation, the researcher always recognizes that the strategies in both categories are always supportive with each another. That is, the strategies which students reported employing in order to discover the meaning of new vocabulary items may help them retain the knowledge of the newly-learned vocabulary items. In the same effect, the strategies which students reported employing to retain their knowledge of English vocabulary may also help them in terms of discovering the meaning of new vocabulary items.

What follow are detailed discussions about the major findings in association with the past research in the field.

Category 1: Strategies to Discover the Meaning of New Vocabulary Items

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The vocabulary learning strategies under this main category are the strategies which were reported to be employed by 133 EST students in order to discover the meaning of new vocabulary items they frequently encounter while studying in class. The strategies are not order according to the most frequently used by the students. Rather, they are ordered in terms of the similarity they share with the preceding one(s):

- *Use a Thai-English dictionary*
- *Use an English-Thai dictionary*
- *Use an English-English dictionary*
- *Guess the meaning from the context*
- *Ask one's classmate or friend*
- *Ask one's teacher*
- *Ask someone other than one's teacher, classmate or friend*
- *Look at the word roots, prefixes or suffixes*
- *Use an on-line dictionary*
- *Use an electronic dictionary*

When taking a close look at the individual vocabulary learning strategies under this category, to discover the meaning of new lexical items, it is found that three main

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strategy groups have been reported being employed by the participants. These strategy groups are: dictionary use, social strategies, and contextual reliance.

With regard to dictionary use, Summers (1988) claims that it plays an important role in EFL learning. For the present investigation, the participants reported making use of different types of dictionaries available including hard copies as well as electronic ones. These strategies are very common for most foreign language learners and have been reported in different research work. Examples are Schmitt (1997), Sanaoui (1995), and Kudo (1999). For the present investigation, some students who reported using dictionaries to discover the meaning of new lexical items claimed that 'it is an easy way to find the meaning of a new word'. However, this is not always easy when it comes to the word with more than one meaning as a few students reported, 'at times I do not know which meaning to choose from because there are many meanings and I cannot decide which one should be the appropriate one' (translated script). The dictionaries used are either bilingual, i.e. English-Thai or Thai-English, or monolingual dictionaries, i.e. English-English. In this regard, Thompson (1987) has demonstrated both advantages and disadvantages of both types of dictionaries. In terms of monolingual dictionaries, he maintained that 'monolingual dictionaries for foreign language learners tend to be unquestioningly regarded as better than bilingual dictionaries. However, monolingual

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dictionaries have serious disadvantages in many language teaching situations: particularly learners will often not know which word to look up, and even when they do, the definitions in the foreign language may not help them very much. Bilingual dictionaries are potentially more efficient and more motivating sources of information for language learners' (p. 282). He also concludes that 'monolingual dictionaries have a very important role to play at the most advanced levels. 'For learners below this level, a bilingual dictionary can do all the useful things that a monolingual dictionary can do' (p. 286). Summers (1988) has supported the use of dictionaries so as to discover the meaning of new foreign words that 'dictionary use is a valid activity for foreign learners of English, both as an aid to comprehension and production' (p. 111).

Another main group of strategies which have also been reported by many students deals with asking other people who they think know English better than themselves such as teachers, classmates, or anyone who knows English. Some students reported that 'my teacher is the best source of knowledge as he is very smart and can answer any questions the students ask. Hence, I normally ask my teacher for the translation' (translated script). However, teachers are not always an ideal resource person as a few students do not want to approach their teachers. Rather, they prefer asking their classmates. As one participant reported, 'I think my friends are better than myself and I can rely on him or her when I

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don't know the meaning of a new word. I don't really want to ask my teacher because I am afraid that he or she will ask me a question and I will feel embarrassed if I cannot answer the question' (translated script).

The last major group of strategies in this category deals with contextual reliance. Many students reported using this strategy as a priority to find out the meaning of a new word, 'when I encounter a new word, the first thing I do is look at the sentence as a whole and then try to guess the meaning. If I cannot guess I'll turn to a dictionary or ask my classmate' (translated script). Regarding using contextual clues to discover the meaning of new foreign words, Judd (1978 cf. Nation, 1982) pointed out that '...in order to grasp the meaning of a word or a phrase, students must be aware of the linguistic environment in which the word or phrase appears' (p. 73). However, it is not always easy for students to get the meaning from the context because at times the context alone does not provide enough information or many words are not always interpreted through the context they appear and more contexts or environments are needed. Nation (1982) asserted that learning words in context would not help with the learning of a word form, as the context of a text is remembered much better than its formal elements. Thus, except by providing a number of different environments, it is difficult to see how context does help the initial learning of a new word and the use of contextualized material might be

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less efficient than the use of word lists (Morgan and Bailey,1943 cf. Nation, 1982) even though context may bring less frequent use of a dictionary and time spent on learning new words.

Category 2: Strategies to Retain the Knowledge of Newly-learned Vocabulary Items

The vocabulary learning strategies under this main category are the strategies which were reported being employed by 133 EST students in order to retain the knowledge of newly-learned vocabulary items. Like the first category, the strategies reported being employed were for classroom learning purposes. These strategies include:

- *Memorize with or without a word list*
- *Keep a vocabulary notebook*
- *Group words based on the synonymy or antonymy*
- *Associate new words with the already-learned ones*
- *Use new words in writing*
- *Use new words to converse with peers*
- *Speak Thai with English loan-words*
- *Keep words as the computer background*

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- *Keep word cards or word charts in one's bedroom*
- *Keep words as rhymes or songs*
- *Use pictures*

The strategies reported being employed in order to retain the knowledge of newly-learned lexical items by the subjects of the present investigation are consistent with past research work, e.g., Sanaoui (1995); Porte (1988); and Hulstijn (1997). In general, we can see that the strategies employed do not deal with deep cognitive processes. This might be that most, if not all, the participants for the present investigation are those who are not very successful in language learning, judging from the perception of their language ability as shown earlier. Another tentative explanation for this phenomenon might be that students may not be conscious of their cognitive process and, thus, are not in the position to make them explicit to the researcher. Furthermore, the findings might be subjected to the reach tool, i.e. the questionnaire. In other words, the open-ended question might not elicit information about cognitive processes. However, this is not the purpose of the investigation to examine how successful or unsuccessful language learners employ vocabulary learning strategies. Rather, the present investigation concentrated solely on lexis, seeking to obtain comprehensive accounts of learners' approaches to vocabulary

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learning. In language learning, retention needs to persist for at least long enough for learning to be reinforced in a following lesson (Nation, 1982). As revealed through the data analysis, the participants reported different types of strategies to help them retain the knowledge of newly-learned words. These strategies can be discussed under the major groups as: rote learning or rote rehearsal; note-taking; and keyword strategies.

In respect of rote learning or rote rehearsal and vocabulary learning, a few past researchers have found that this method or strategy has been used by foreign language learners, e.g., Naiman *et al* (1975); O'Malley and Chamot (1990); Wenden and Rubin (1987); Gu, (2002); Gu and Johnson (1996); Kudo, (1999); and Sanaoui (1995). This strategy has been employed by language learners to commit new foreign words to memory and has been regarded as the first and easiest strategy people pick up and use. Naturally language learners keep repeating new words until they can be recognized (Gu, 2003). In repeating new vocabulary items, the learners may repeat the word mentally or aloud several times when they encounter it, or they may return to a lexical item sometime after they have encountered it and repeat it (Sanaoui, 1995). In addition, Oxford (1990) pointed out that the exact form of rehearsal could be just a simple reading or writing of the word, the repetition of the word and the meaning, or repetition may involve some form of structuring. Therefore, it is not surprising to see that most of the foreign

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language learners have employed this strategy more frequently than others. This is also reported in Lawson and Hogben (1996, p. 120) that the most frequently used procedures by Italian language learners involved some form of repetition. Not only did they use repetition in almost two-thirds of the opportunities, but repetition was used on most of the words by most of them.

Another group of strategies which have been reported here is taking notes, may be in the form of vocabulary notebooks, word cards or wordlists. After getting information about a new word, learners may take notes (Gu, 2003); however, McCarthy (1990) has pointed out that the learners differ in what they do in note-taking, when they take notes, and how they take notes.

Finally, a few strategies in the group of 'keywords' were also reported being employed (e.g. *Group words based on the synonymity or antonymity and associate new words with the already-learned ones*). The 'keyword' method involves linking an English word to another English word which sounds like the 'to be learned foreign word'. In addition, Cohen (1987, p.51) has discussed the major types of associations or linking consciously used by learners to improve their performance in learning new words. These types of associations can be created, for example, by linking the words to the sound of a

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word in the native language, to the sound of a word in the language being learned, or to the sound of a word in another language.

In terms of the effectiveness of this type of strategy, according to Gruneberg and Sykes (1991), a large number of studies have recently shown that the keyword method of vocabulary acquisition considerably enhances the rate of retention of foreign words. However, it might be argued that even if the keyword methods were no more effective than conventional methods of vocabulary acquisition, if students found their use more enjoyable and interesting, then this in itself would be enough reason to utilize the technique in foreign language learning.

- **What are the implications of these research findings for the teaching and learning of English for science-oriented students?**

The findings of the present investigation are generally consistent with the previous studies in terms of students' employment of strategies in learning new foreign vocabulary items. The strategy classification has been carried out and is similar to those of a few past researchers'. As mentioned earlier, on the whole the strategies reported being employed by science-oriented students in the study did not involve mental processes for lexical acquisition as already discussed previously. However, an implication of the findings of

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the present investigation revealed that learners' practices for vocabulary learning are an important aspect of lexical learning that merits future attention. Although the findings do not provide insight into mental processes for vocabulary learning, understanding learner's habits of study contributes to a better understanding of how they come to learn the lexis of the target language, in this case, English. Another implication that can be drawn from the findings of the present investigation is that students should be encouraged to make full use of dictionaries no matter what form they are in. As discussed earlier, teachers can design tasks in order to improve learner skills in using dictionaries. Another strategy which has been used by students and which they should be encouraged to use for discovering the meaning of new words is guessing from context. This has been evidenced in Seibert (1945 cf. Nation, 1982) of the high possibility of success in guessing the meaning of words from context. Trained learners can guess between 60 to 80% of the unknown words in a text using only context clues. Learners should be given guidance and practice in the techniques of guessing from context because this will be valuable both in learning new words and in establishing words already studied in their already-learned wordlists.

Conclusion

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The present investigation has been conducted in a data-based, systematic, and non-judgmental descriptive and exploratory manner. It has contributed to the field of research on vocabulary learning strategies in terms of their types. The main contribution of the present investigation has been vocabulary learning strategies of science-oriented university students learning English for science and technology in Thailand. Data collection and data analysis have been carried out qualitatively.

Lastly, the researcher believes that with appropriate instruments for eliciting vocabulary learning strategies, as well as a research design, a researcher can gain further insights into how students deal with language learning especially new vocabulary items. It is worth noting that ‘what learners do while studying words is more important than how motivated they are, how hard they work, how much time they spend and the number of repetitions of each word’ (Nation, 1982, p. 25). Furthermore, as shown in past research, it is highly recommended that students try different strategies in order to learn new words in English. This is because no single strategy has been proved the best of all. Finally, such variables as teachers’ teaching styles, students’ language proficiency levels, learner belief in language learning, or students’ socio-economic status, could have an impact on such research if they had been taken into account.

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