

The Effects of Semantic Mapping on Vocabulary Memorizing

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Abstract: At Tran Quoc Toan High School, when students learn English, they usually faced with many difficulties not only in specific language skills but also in vocabulary memorizing. Because of their learning habits and learning strategies, they failed to memorize words for a long time and to recall words when necessary. Based on literature review, it is found that semantic mapping has had good effects on vocabulary learning; especially it improves the retention and retrieval of word meanings. This study was conducted to explore the effects of semantic mapping on students' memorizing and students' attitudes towards this method. This experimental study followed a two-group pre-test and post-test design. The participants were 60 Grade 11 students at Tran Quoc Toan High School. Three instruments: (1) the *tests on vocabulary knowledge*, (2) the *questionnaire on the students' perceptions towards semantic mapping*, and (3) the *interview on the students' attitude towards semantic mapping* were employed to collect both quantitative and qualitative data. The results indicated that the students in the experimental group outperformed those in the control condition in retaining word meanings. The results also proved that the students had positive attitudes towards semantic mapping. This leads to the implication that the semantic mapping can improve high school students' vocabulary retention and is promising to vocabulary teaching and learning.

Introduction

1. Rationale

The importance of vocabulary in English as a second language (ESL) or English as a foreign language (EFL) learning process has been widely recognized. Much of the research indicates that enlarging language vocabulary has been one of the objectives of many EFL learners. When learning English, students in my teaching context, Tran Quoc Toan High School, also try hard to improve their vocabulary knowledge. However, students have to cope with many difficulties in learning vocabulary, especially in memorizing and recalling the word meanings. Low vocabulary proficiency makes an obstacle for them in acquiring language knowledge and participating in the activities in class. It is frustrating when they discover that they cannot communicate effectively because they do not know enough words they need. Students usually forget the words they learnt or fail to use words communicatively. They cannot get words into long-term memory and recall them when necessary. Although they spend most of their time learning vocabulary, the results are disappointing.

One of the reasons for students' low vocabulary retention and retrieval can be addressed as their learning habits. Their learning habits such as writing down words on a piece of paper, learning words by heart, heavily depending on wordlists in textbook, passively waiting for teacher's explanation for new words seem to be ineffective and make them bored with learning vocabulary. In order to memorize new items, students often use rote memorization techniques. As they reported, they used to write down the words for several times, to speak aloud the words and to make sentences with words. They admitted that they fail to recall most of the words they had learnt before as there were no clues. It can be seen that students' bad memory is due to lack

of appropriate vocabulary memorizing strategies. They are not provided with different vocabulary learning techniques and are not encouraged to use them. They also have no chance to work with words in a deeper process. This is a pity because working with words can be enjoyable and satisfying for learners.

The questions posed to teachers of English at Tran Quoc Toan High School are how to help students memorize words effectively and how to motivate them in vocabulary lessons. Teachers can encourage their students to systematically record vocabulary that they taught in class. They also provide them with strategies transfer this record into their long-term memory so that each item is added to the repertoire of words and phrases that they can understand and use when necessary.

There is a wide variety of previous research into the effects of semantic mapping on vocabulary memorizing: Ward and Annita (1998), Pikula (1987), DeCarrico (2001), Margosein, Pascarella and Pflaum (1982) and Vogt (1983). The above research indicated the positive effects of semantic mapping on students' vocabulary memorizing.

In my teaching context at Tran Quoc Toan High School, the English teachers seldom use semantic mapping in teaching vocabulary. Besides, there was not yet any empirical study on the use of semantic mapping in vocabulary teaching and learning at Tran Quoc Toan High School.

Literature Review

Therefore, I have a high motivation to conduct this study.

2. Aims and significance of the research

2.1 Aims of the research

The research was conducted with the aim of exploring the effects of semantic mapping on students' memorizing and students' attitudes towards this method. Specifically, I aim to compare the effectiveness of two techniques for vocabulary memorizing: using semantic mapping and using word lists.

1.2.2 Significance of the research

In this study, the effects of semantic mapping on students' vocabulary memorizing were investigated. It was hoped that the results of the research could supply comprehensive understanding into the technique; therefore, it will encourage certain use of semantic mapping for vocabulary teaching and learning in high schools.

1. Vocabulary learning

1.1. Vocabulary

So far there have been a lot of definitions of vocabulary. Vocabulary is defined as words in a specific language or freestanding items of language that have meaning (McCarthy, 1990). Penny Ur (1996) defined vocabulary roughly as "the words we teach in the foreign language". She also suggested that "a new item of vocabulary may be more than a single word, a compound of two or three words (e.g., *post office*, *mother-in-law*), and multi-word idioms (e.g., *call it a day*)".

Besides, vocabulary is broadly defined as knowledge of words and word meanings (Lehr et al., 2004). According to Lehr and his colleagues, vocabulary is more complex than this definition suggests. First, words come not only in oral forms including those words that can be recognized and used in listening and speaking but also in print forms to be recognized and used in reading and writing. Second, word knowledge also comes in two forms: receptive and productive. Receptive vocabulary is words that can be recognized in reading and listening. Productive vocabulary refers to words that can be used in speaking and writing (Lehr et. al., 2004). Therefore, vocabulary is understood as knowledge of word spelling, pronunciation, collocations (i.e. words it co-occurs with), and appropriateness (Nation, 1990). However, Pyles (1970) confirmed that vocabulary is the focus of language with its sounds and meaning, which interlock to allow us to communicate with one another.

As discussed above, vocabulary can be seen in many different ways. Vocabulary refers to words or a set of words in a language or knowledge of words regarding its forms, meanings and how to use it accurately in the context. In the present study, vocabulary refers to the words, compounds and idioms in a language that can be used to convey and receive information in oral and written communication.

1.2. The importance of vocabulary

Regarding the importance of vocabulary, Krashen (1989) pointed out that “a large vocabulary is, of course, essential for mastery of a language” as “without vocabulary, nothing can be conveyed” (Wilkins, 1972).

Rubin and Thompson (1994) considered the significant role of vocabulary in communication as stating that “one cannot speak, understand, read or write a foreign language without knowing a lot of words. Vocabulary learning is at the heart of mastering a foreign language”. Nguyen and Khuat (2003) also accepted that vocabulary knowledge plays an important role in learning a foreign language. Vocabulary is one element that links the four skills of speaking, listening, reading and writing all together. Vocabulary is a core component of language proficiency and provides much of the basis for how well learners listen, speak, read, and write (Richards and Renandya, 2002).

In fact, vocabulary is a means to support communication. It is a necessary component of language instruction. In order to communicate well in a foreign language, learners should acquire an adequate number of words and should know how to use them accurately. When emphasizing the importance of vocabulary in communication, Della and Hocking (1992) also claimed that with a little grammar, the learners can have a little smooth communication, but without vocabulary, it is difficult for others to understand the information the learners want to express. For this reason, a lack of good grammatical structures may not interrupt communication. However, if we lack vocabulary, there is no successful communication. With a good knowledge of vocabulary, learners may feel confident in communication, and it contributes to the success in communication. However, the question to arise is which words are necessary for learners to know and how to remember these words.

1.3. *Types of vocabulary*

Researchers (Nation, 2001; Ellis, 1997) have categorized groups of English vocabulary by frequency of overall occurrence to determine which words are most necessary for learners to know. Two common divisions are high-frequency words and low-frequency words. High-frequency words, including function words and content words, cover a very large proportion of the running words in spoken and written texts and occur in all kinds of uses of the language. Low-frequency words make up over 5 percent of the words in an academic text. They include all words that are not high-frequency, academic or technical words for a particular subject.

In reality, English learners try their best to master a large amount of vocabulary. Based on the learners' English level and the discussed issue, vocabulary and its compounds and idioms focused in the present study will be chosen basing on frequency and usefulness to the needs of the learners.

2. Vocabulary teaching

In general, language learning and teaching are based on theories or beliefs about language. As far as vocabulary teaching is concerned, it is necessary to focus on the implementation of communicative and lexical approaches (Hasbún, 2005).

The Lexical Approach introduced by Michael Lewis in 1993 puts a greater emphasis on the meaning and use of different language items with a set of principles based on a new understanding of language. Lewis (1997, cited in Hasbún, 2005) claims that most of the activities used in the Communicative Approach are compatible with the Lexical Approach, then what teachers need to do is adapt activities so that the tasks have a clear lexical focus. Basing on lexical principles, the following tasks are proposed (Hasbún, 2005):

- In de-contextualized gapped sentences, the gap should not occur in the topic element.
- Since the quantity and quality of the input influences progress the most, exercises must be based on highly probable, useful examples.
- If exercises are to teach rather than test, learners must recognize some answers and deduce others by a process of elimination, using linguistic clues, the group's shared knowledge, and a small element of plain guesswork.
- When working with collocations, words should be presented in descending order of information content. This would make the first examples the strongest collocations.
- Collocations should be presented in context. It is not a good idea to have learners match de-contextualized words.

Here is a list of the basic exercise types (from Hasbún, 2005):

- Identifying chunks: This is a fundamental skill which aids language acquisition
- Matching: Parts of collocations, expressions, lines of stereotypic dialogue
- Completing: Blank spaces correspond to partner words from fixed collocations
- Categorizing: Use categories learners perceive or follow some guideline suggested by the teacher.
- Sequencing: Learners are given expressions or verbs and are asked to put them in the most likely order.
- Deleting: Learners circle the word that does not belong.

In the present study, in light of the lexical approach, communicative approach will be employed with some adaptation.

3. Memorizing word meaning

3.1. Short-term and long-term memory

Cognitive psychologists divide memory into short-term and long-term memory according to duration of memory retention and capacity of recalling information after the original input. Long-term memory retains information for use in anything but the immediate future. Short-term memory is used to store or hold information while it is being processed. The object of vocabulary learning is to transfer the lexical information from the short-term memory to the more permanent long-term memory (Schmitt, 2000).

According to Gairns and Redman (1986), long-term memory is seemingly inexhaustible and can accommodate any amount of information. It is generally acknowledged that we need to work much harder to commit information to long-term memory, and the type of repetition that is essential to short-term retention may not be adequate for long-term retention. However, the distinction between short-term retention and long-term retention is not always clear-cut. Information entering short-term memory may pass quite effortlessly into long-term memory, and some learners may find repetition a very effective way of transferring information into long-term memory.

When learning vocabulary, learners often have problems with retention of words for a long time. They usually fail to put the words into long-term memory. In the present study, short-term memory is considered as the initial memory of the word meaning at the end of the lessons whereas the number of words can be recalled at the next lessons or at the end of the study is referred as ones from long-term memory because the participants in the study have only three forty-five-minute lessons per week.

3.2. Major factors affecting word memorization

There are various reasons why students remember some words better than others: nature of the words themselves, situations under which the words are learnt, how the words are taught to students and so on. Gairns and Redman (1986) showed that learning new items involves storing them first in the short-term memory and afterwards in the long-term memory, and the long-term memory can hold any amount of information. They stated that our “mental lexicon” is highly organized and efficient, and that semantic related items are stored together. Word frequency is another factor that affects storage, as the most frequently used items are easier to retrieve. We can use this information to facilitate the learning process by grouping items of vocabulary in semantic fields such as topics.

Besides, storing information is not the only difficulty faced by the learners when learning vocabulary; then, retrieval is another on which the present research is centered. Nunan (1990) shared the idea that learners can be encouraged to develop their own personal learning styles for vocabulary, in such areas as memorizing and retaining new words. However, Cater et al. (1989) assured that the storage of information does not guarantee its retrieval. Learners need ways to increase the probability that retrieval cues will be effective, just as they need techniques that will permit the recall of words that are appropriate for the situation. Cater also pointed out techniques that enhance production will have to be centered on the meanings of words rather than on their forms because most of our production has to do with searching for an appropriate meaning to fit

the particular occasion. The most effective associate bonds for production, therefore, connect the words with their meanings.

3.3. Strategies to improve vocabulary retention

Vocabulary learning strategies are one part of language learning strategies which in turn are part of general learning strategies (Nation, 2001). Some vocabulary learning strategies such as metacognitive, cognitive, memory and activation strategies are listed by Gu and Johnson (1996, cited in Ghazal, 2007, p.85-86):

Metacognitive strategies consist of selective attention and self-initiation strategies. Cognitive strategies entail guessing strategies, skillful use of dictionaries and note-taking strategies. Memory strategies are classified into rehearsal and encoding categories. Word lists and repetition are instances of rehearsal strategies. Encoding strategies encompass such strategies as association, imagery, visual, auditory, semantic, and contextual encoding as well as word-structure. Activation strategies include those strategies through which the learners actually use new words in different contexts.

Encoding strategies are mentioned in literature as vocabulary learning strategies that can enhance retention intervals of vocabulary (Gu & Johnson, cited in Segler et al. 2001). Encoding strategies include such strategies as association, imagery, visual, auditory, semantic, and contextual encoding as well as word-structure (Ghazal, 2007). Memory of vocabulary can be enhanced when there is an association of new words and known ones sharing a similar part in spelling, sound or meaning. Employing images, semantic mapping or other graphic organizer techniques (Segler et al. 2001; Nation, 2001 cited in Ghazal, 2007) is encouraged for better encoding which results in better retrieving later. One of implications for classroom practice that Channell (1988) derived from her research is that learners should be encouraged to make their own lexical associations when they are learning vocabulary. With regard to word meaning and retrieval, many researchers (Hague, 1987; Cater, 1987; Amer, 2002) agreed that semantic mapping is effective for long-term memory and aids the recall. Therefore, in this study, the researcher concerned about the semantic mapping technique which will be presented in the next section.

4. Semantic mapping for vocabulary teaching

4.1. Definitions of semantic mapping

Developments in “lexical semantics” have prompted the development of the “semantic field theory”, “semantic networks” or “semantic grids” strategies which organize words in terms of interrelated lexical meanings. The “semantic field” theory suggests that the lexical content of a language is best treated not as a “mere aggregation of independent words” but as a collection of interrelating networks or relations between words (Stubbs, cited in Amer, 2002). It is noteworthy that words may be grouped together (related to each other) according to different criteria. Animals, for example, may be grouped in terms of physical features; they may be grouped in terms of nonphysical features such as pet, wild, food, etc. (Gairns and Redman, 1986).

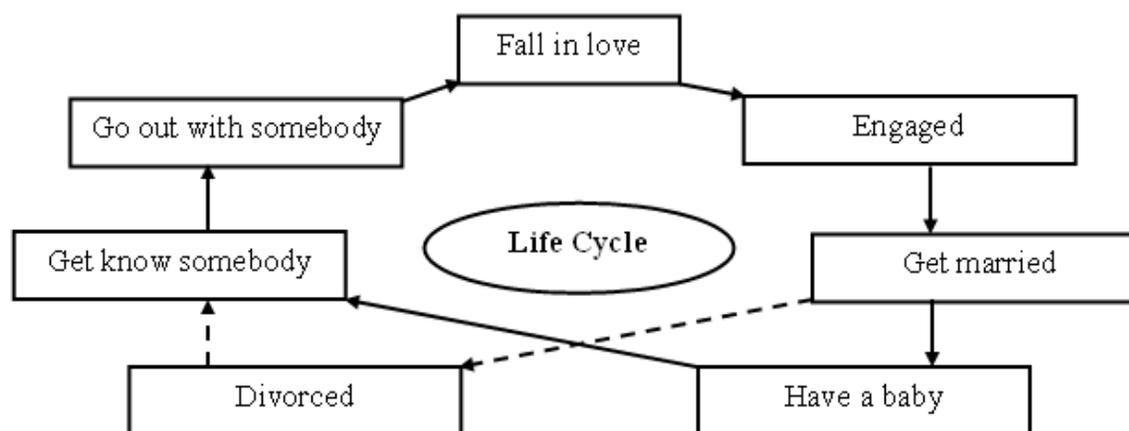
Semantic elaboration consists of a series of techniques as semantic feature analysis, ordering, pictorial schemata and semantic mapping (Ellis, 1995; Sokmen, 1997). Semantic mapping and semantic feature analysis draw learners’ prior knowledge and use discussion to elicit information about word meanings. Semantic feature analysis is similar to semantic mapping, with the

exception that it uses a grid rather than a map as graphic display. Following examples will illustrate the two techniques.

Means of transport	one wheeled	two wheeled	four wheeled	foot powered	motor powered	on land	in the water	in the air
bicycle	-	+	-	+	?	+	-	-
car	-	-	+	-	+	+	-	-
boat	-	-	-	?	+	-	+	-
plane	-	-	-	-	+	-	-	+
uni-cycle	+	-	-	+	-	+	-	-
Motorbike	-	+	-	-	+	+	-	-

("+" for positive examples; "-" for negative examples, "?" for items which may be true in certain circumstance)

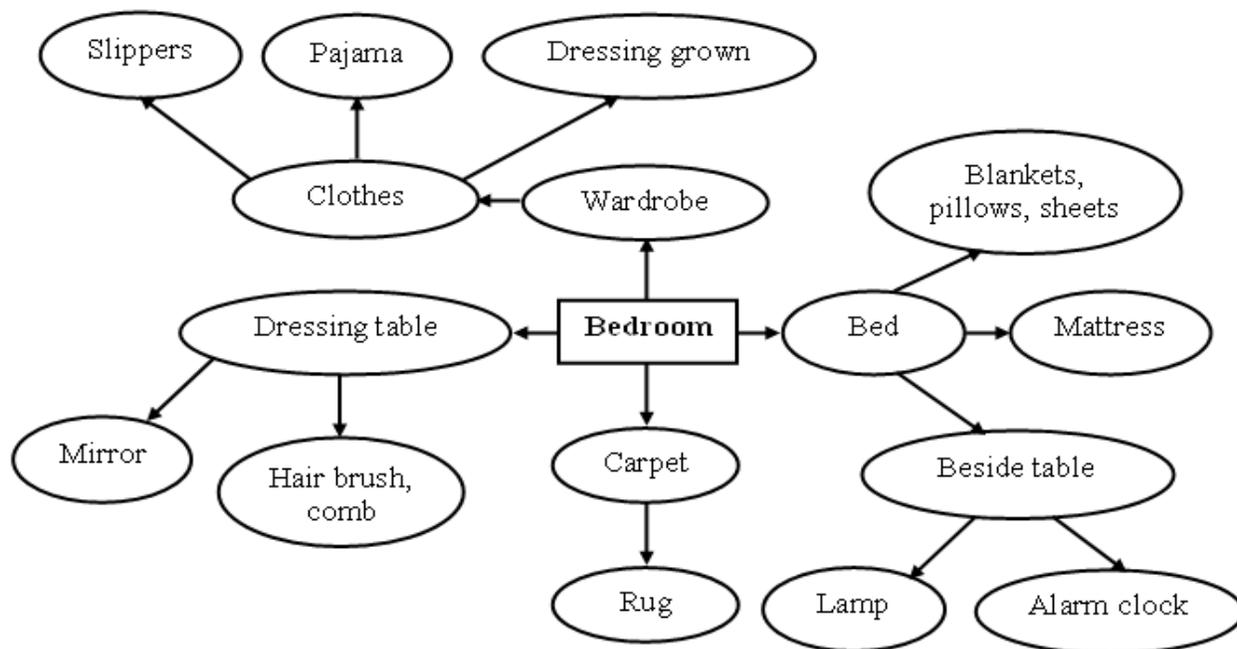
Feature 1 Semantic feature analysis for "means of transport" (Neisel, 2000)



Feature 2 Semantic mapping for "human life circle" (Gairns and Redman, 1986)

Semantic elaboration focuses on word meaning association attached on words. Words appear to be organized into semantically related sets in mind and thus the associations attached to a word will affect the way that it is stored in the brain. Furthermore, knowing a range of association for a word helps understand its full meaning and helps recall the word form or its meaning in appropriate context (Nation, 2001).

Semantic mapping generally refers to brainstorming associations which a word has and then diagramming the results (Sokmen, 1997). Johnson, Pittelman and Heimlich (1986) described semantic mapping as "categorical structuring of information in graphic form". Semantic mapping is one of word association techniques. It is defined as a technique to make arrangement of words into a diagram, which has a key concept at the centre or at the top, and related words and concepts linked to the key concept by means of lines or arrows (Gairns and Redman, 1986).



Feature 3 Items in bedroom (Gairns and Redman, 1986)

4.2. Semantic mapping in vocabulary teaching and learning

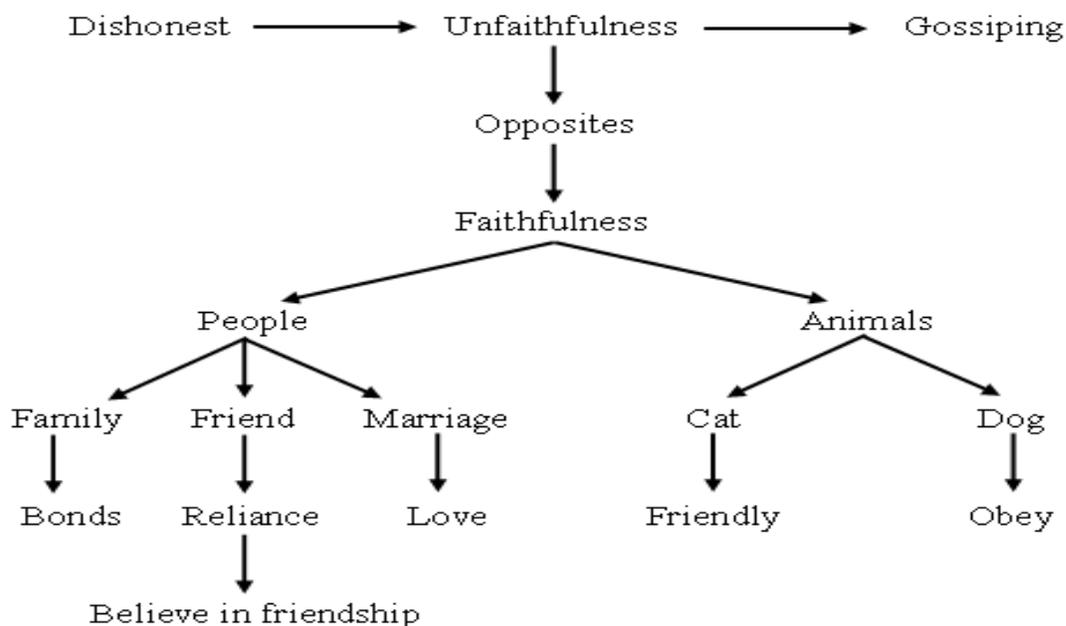
Sokmen (1997) mentioned four techniques for semantic elaboration: semantic feature analysis, semantic mapping, ordering, and pictorial schemata. In this section, semantic mapping in vocabulary teaching and learning is concerned about.

Since vocabulary consists of a series of interrelating systems and is not just a random collection of items, there seems to be a clear case for presenting items to students in a systematized manner which will both illustrate the organized nature of vocabulary and at the same time enable students to internalize the items in the coherent way. Words are related to each other in various ways. Two examples are that (1) the meaning of a word depends to some extent on its relationship to other similar words, often through sense relations, and (2) words in a word family are related to each other through inflectional and derivational affixes (Schmitt, 2000). In semantic mapping, words are grouped in the former way.

Semantic mapping has been usually used for (1) general vocabulary development, (2) pre and post-reading, (3) teaching of a study skill, (4) a link between reading and writing instruction, and (5) an assessment technique. Johnson and Pearson (1984) generalized semantic mapping as a strategy of vocabulary instruction as followed:

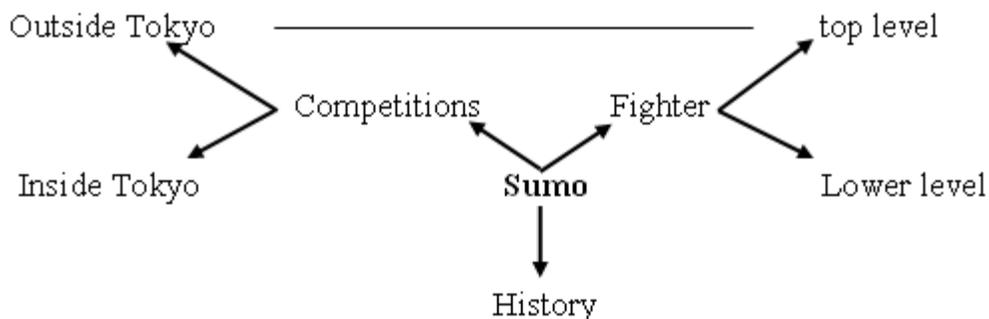
1. Write a key word or topic related to classroom work on a sheet of paper, the blackboard, or a transparent slide.
2. Encourage the students to think of as many words as they can that are related to the selected key word or topic.
3. Guide the students to list the words by categories.
4. Have students label the categories.
5. Discuss the relationships between these words.

There is another kind of semantic set which has to do with “stimulus-response pairs”, such as accident-car and baby-mother. These seem to be a great uniformity in people’s responses to certain stimulus words which ought to be exploited to help students form more effective association (Cater et al, 1989, p.71). Sokmen (1997) shared the same idea with them. In his study, when being asked to give words they thought of when they heard the word “unfaithfulness”, low intermediate ESL students generated 16 words or phrases. After clustering words, which went together, they mapped the relationship between these words as followed:



Feature 4 Semantic mapping for the word “unfaithfulness” (Sokmen, 1997, p.250)

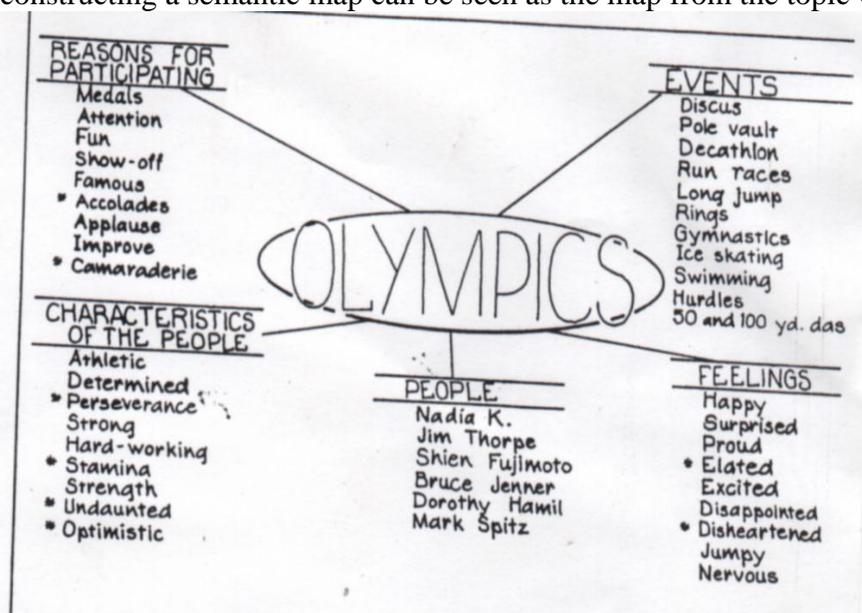
Furthermore, Nation (2001) saw the interaction between the teacher and his learners when using semantic mapping. He stated that semantic mapping involves the teacher and learners working together to build up on the blackboard a visual framework of connections between ideas (p.129). This technique helps students remember the stock of vocabulary they have learnt related to the subjects.



Feature 5 Semantic mapping for the word “Sumo”

Nation (2001) pointed out in his study that there could be several starting points for semantic mapping. It can involve the recall of a previously read story, a recent or current event, a film, a unit of study or simply learners’ general knowledge of a topic. He also cited Stahl and Vancil’s opinions that the discussion occurring during the building up of the semantic map that makes the activity contribute to vocabulary learning and the skill is important in the way that the teacher enters into a dialogue with learners, encourages them and supports their participation in the dialogue.

In the present study, vocabulary will be introduced by using semantic mapping. The results of constructing a semantic map can be seen as the map from the topic Olympics as followed:



Feature 6 Semantic mapping for the word “Olympics” (from Johnson, Pittelman and Heimlich, 1986)

In four semantic elaboration techniques (ordering, semantic feature analysis and pictorial schemata), semantic mapping is commented to be suitable for not only beginning learners but also advanced ones. The effectiveness of semantic mapping recognized in the previous related study will be discussed in the following section.

5. The previous related studies

Research on semantic mapping has been extensively conducted. Most of the studies focus on using semantic mapping as pre-activities for reading, speaking or writing lessons. The subjects of these studies are often intermediate learners. The results have shown the significant difference in vocabulary learning. Learners using semantic mapping could organize words systematically and recall word meanings easily.

Amer (2002) realized that adult learners are better at remembering words from lists that contain semantically related subsets than words from lists of unrelated words. In addition, he found out

that if the semantically related words are separated in the lists, adults tend to cluster them in output.

Ward and Annita's study (1998) showed that semantic mapping increased cognitive processing and developed the cognitive structure. They suggested using semantic mapping as a pre-reading or pre-writing stimulus, or as a post-reading check of comprehension. They concluded the ultimate goal of semantic mapping is to introduce the students to a technique that they could use regularly to organize what they had read, relate this content to what they already know, and expand their store of knowledge through reading.

Some researchers compared the effectiveness of semantic mapping with of other techniques. Pikula (1987) compared the effectiveness of the two techniques (semantic mapping and dictionary) for 38 students of experimental and control groups. In his study, the experiment group developed the network of semantic categories using their existing knowledge of vocabulary whereas the control group used a dictionary to learn vocabulary. Posttest results at the end of the six-week period indicated statistically significant difference between the two groups. The experimental group exhibited a great enough gain over the control sample.

DeCarrico (2001) also conducted a research on semantic mapping. She made a decision that semantic mapping is an activity that helps bring into consciousness relationships among words in a text and helps deepen understanding by creating associative networks for words. A text is chosen based in the words to be learnt and students are asked to draw a diagram of the relationship between particular words found in the text. A variation on this technique, a "vocabulary network" could be designed to help even beginning students learn to make semantic associations within a particular superordinate heading. She concluded that "especially at the beginning levels the teaching of words lists through words association techniques has proven to be successful way to learn a large number of words in a short period and retain them over time" (p.288-289).

In their case studies, Margosein, Pascarella and Pflaum (1982) and Vogt (1983) confirmed that semantic mapping has a greater impact on vocabulary acquisition than does the context clue approach or the traditional dictionary-definition-plus-example approach, because semantic mapping motivates the students to connect their prior knowledge to new words and to see the lexical or conceptual relationships among words.

Some other researchers; however, took caution against the danger of presenting closely related new words. They suggested that learners should start by learning semantically unrelated words (Tinkham, 1993; Waring, 1997) and also avoid learning words with similar forms (Laufer, 1997). Nevertheless, after examining the research of Tinkham and Waring, Liu (?) believed that the research methodology itself quite puzzling. In their research, Tinkham and Waring had their participants learn new words paired with artificial nonsense words (e.g., pear—okess, mouse—kunop) simply by oral repetition. Then, they contrasted the trials in which their participants learned semantically related words to the trials in which their participants learned unrelated words. Liu (?) also pointed out that Tinkham and Waring both made an incorrect conclusion that the participants learned more slowly when they were shown words in semantic clusters paired with artificial words.

In research mentioned above, there are contrasting points of view. Most of the research at It is noticeable that more studies need to be conducted to test the semantic mapping's effectiveness on high school students who are at pre-intermediate level of English proficiency. Besides, there was not yet any empirical study on the use of semantic mapping in vocabulary teaching and learning in the researcher's context. For this reason, the researcher conducted this study to gain more insights into the addressed matter in her context.

6. Summary of the literature

This section summarizes the literature related to vocabulary learning and teaching, word meaning memorizing and semantic mapping for vocabulary teaching. Some previous related studies are also presented. These studies have shown that semantic mapping is a useful vocabulary teaching technique which helps to memorize and recall word meanings better. Findings from the above studies reveal some aspects of research values influencing and guiding the implementation of the present study. In this study, the researcher hypothesizes that (1) students would memorize and recall vocabulary easily and effectively by using semantic mapping technique; (2) students would have positive attitudes towards semantic mapping technique.

Methodology

1. Research questions and hypotheses

1. Research questions

In order to investigate the effects of semantic mapping on vocabulary memorizing, the researcher attempted to find out the answers for the following questions:

1. Does semantic mapping help the students memorize word meanings effectively?
2. What are the students' attitudes towards the semantic mapping technique?

2. Hypotheses

Based on the relevant literature, it was hypothesized that semantic mapping would have a positive effect on students' vocabulary retention. Besides, the researcher also expected that the participants would have positive attitudes towards the use of semantic mapping in vocabulary memorizing.

2. Research design

The research was an experiment with a two-group pre-test and post-test design. In the research, class 11CB1 was randomly assigned as the experimental group and class 11CB2 as the control group. Before and after the experiment, both groups were given the selective test, the pre-test and the post-test of vocabulary knowledge. During the experiment, the implementation of semantic mapping technique was monitored to help the experimental group memorize word meanings whereas the word lists, as a traditional way of teaching vocabulary, was taught to the control group. In addition, before and after the experiment, a questionnaire was carried out to measure the two groups' attitude towards semantic mapping at the two points of measurement. Besides, an interview was conducted to nine students in the experimental group so that the researcher could get more in-depth information of the students' perceptions of the implementation of semantic mapping technique.

3. Participants

The participants involved in the research were sixty students in grade 11 in Tran Quoc Toan high school in the 2009-2010 academic year. The high school is in the suburbs of Cao Lanh city, Dong Thap province. English lessons are given to students with only three periods a week. Most students rarely have a chance to practice their English; therefore, their English level was supposed to be pre-intermediate. There were 30 students in each group and the students' average age is seventeen.

Table 1. The Numbers of the Students in the Two Groups

Group	Female	Male	Total
Control group	16	14	30
Experimental group	19	11	30
Total	35	25	60

Additionally, the teacher researcher took responsibility for teaching the two groups and collecting as well as analyzing data. However, to make the research more objective, another teacher helped score the vocabulary tests.

4. Materials

In the research, the used material was the textbook "Tieng Anh 11". In the textbook, each unit is clustered into five lessons: reading, speaking, listening, writing and language focus, respectively. Each lesson is taught in one period of forty-five minutes. Grammar is taught in language focus whereas vocabulary is not a particular lesson, but is taught within lessons of four skills (i.e., reading, speaking, listening and writing). During the experiment, the students in the two groups were taught vocabulary in unit 13, 14 and 15 in the textbook.

5. Research instruments

To answer the research questions, the researcher measured the students' vocabulary knowledge before the experiment and vocabulary retention after the experiment and the students' attitude towards the use of semantic mapping technique. To measure these two variables, three instruments were employed: (1) the *tests on vocabulary knowledge*, (2) the *questionnaire on the students' perceptions towards semantic mapping*, and (3) the *interview on the students' attitude towards semantic mapping*. These three instruments will be respectively discussed in the following sections.

5.1 *Tests on vocabulary knowledge*

5.1.1 *The selection vocabulary test*

At the beginning of the study, a selection test of eighty words was given to the students. The words were presented in the units 13, 14, 15 in the textbook *Tieng Anh 11* which were going to be learnt during the experiment. In the test, students were asked to write down the Vietnamese meanings of any words they already knew in forty minutes. Thirty words which both groups totally did not know the meanings were chosen. These thirty words were put in the list of target words.

5.1.2 *Pre-test and post-test*

Adapting the tests

In the study, the pre-test and the post-test were adapted from the tests in Truong (2009) because they were suitable to the researcher's aim of measuring the students' vocabulary knowledge before and after the experiment. The pre-test and the post-test were designed to be similar to each other in terms of content, task types, allotted time and numbers of the tasks. In other words, the post-test was the pre-test with the items rearranged. In order for the post-test's validity and reliability to be ensured, students were not given the answer keys of the pre-test. Besides, they were not notified in advance that they would be given another test.

It should be noticed that each of the tests included two parts with the range of scores displayed from 0 to 40 for each part. In the first part with forty items, there were 30 target words and the other 10 additional distracters (items 19, 32, 33, 34, 35, 36, 37, 38, 39, 40 in the pre-test and items 1, 2, 3, 4, 5, 7, 9, 10, 26, 29 in the post-test). The distracters were used to verify the students' familiarity with the target words. With the aim of testing the students' productive ability, this part required the students to write the English words for the given Vietnamese equivalents in twenty minutes. Before giving the second part of the tests, the teacher researcher collected the answer sheets of the first part. Some examples from the first part of the tests are shown in Table 2 below.

Table 2. Examples from the First Part of the Tests

I. Write down the English equivalents of the following Vietnamese words. (Hãy viết nghĩa Tiếng Anh của các từ Tiếng Việt sau đây).	
Ví dụ: 0. sở thích: hobby	
Vietnamese words	English equivalent meanings
1. trò chơi bi-da	-----
2. thời gian rảnh rỗi	-----
3. môn khắc kính	-----
4. trọng lực, lực hấp dẫn	-----
5. khóa học	-----

Additionally, the second part of the tests containing 40 multiple choice items with the aim of testing the students' ability of recognition was given. This part was taken in twenty-five minutes. In each multiple choice item, the English target word was in bold. In each of the following three multiple-choice options, there was one Vietnamese word or phrase underlined. One of the underlined Vietnamese words or phrases was the equivalent of the English target word whereas the other two were connected or quite incorrect in meaning. Some examples from the second part of the tests are shown in Table 3 below.

Table 3. Examples from the Second Part of the Tests

<p>II. Circle the correct answers (Khoanh tròn những đáp án đúng)</p> <p>1. I would not call myself an avid stamp collector.</p> <p>A. Tôi không tự cho mình là một người <u>cuồng nhiệt</u> sưu tầm tem cho lắm.</p> <p>B. Tôi không tự cho mình là một người <u>say mê</u> sưu tầm tem cho lắm.</p> <p>C. Tôi không tự cho mình là một người <u>kiên nhẫn</u> sưu tầm tem cho lắm.</p> <p>2. He gets the stamps and discards the envelopes.</p> <p>A. Anh ấy lấy những con tem ra và <u>vứt bỏ</u> những phong bì.</p> <p>B. Anh ấy lấy những con tem ra và <u>xếp lại</u> những phong bì.</p>

- C. Anh ấy lấy những con tem ra và cắt lại những phong bì.
3. He was in orbit around the Earth at a speed of more than 17,000 miles per hour.
- A. Anh ta đã ở trên vòng xoay bay vòng quanh Trái Đất với vận tốc hơn 17,000 dặm trên giờ.
- B. Anh ta đã ở trên đường bay bay vòng quanh Trái Đất với vận tốc hơn 17,000 dặm trên giờ.
- C. Anh ta đã ở trên quỹ đạo bay vòng quanh Trái Đất với vận tốc hơn 17,000 dặm trên giờ.

Piloting the tests

Piloting testing can help avoid costly time-consuming problems during the data collection procedures (Gass & Mackey, 2000). In order to be used in this study, the pre-test and the post-test on vocabulary knowledge were piloted to ensure the validity of this instrument. Forty-two students who were of the similar background and level of English proficiency as those in the official study got involved in the pilot test. The results from the piloted test showed that with clear initial instructions and examples given in the tests the pre-test and the post-test on vocabulary knowledge used in this study were valid.

Scoring the tests

To score the pre-test and the post-test, the same scoring system was used. Each correct answer was given one mark. There were no minus marks for providing incorrect answers. Therefore, the maximum scores of each test could be 80 for 80 correct items. The researcher and her colleague independently scored the students' tests to make sure that the test results were reliable and objective. This original score was then subjected to SPSS for data analysis.

5.2 Questionnaire on the students' perceptions towards semantic mapping

The questionnaire aimed at measuring the students' perceptions towards semantic mapping technique before and after the research. The questionnaire could help the researcher collect more detailed data on the students' perceptions and interests that could not be noted by the tests. In addition, the questionnaire provided anonymity which helped provide reliable large amounts of responses. Actually, Wilson and McLean (1994, cited in Cohen, Manion and Morrison, 2000) suggested that "the questionnaire is a widely used and useful instrument to collect survey information research".

Adapting the questionnaire

The questionnaire was adapted from Huynh's (2009) 24-item questionnaire on learners' attitudes towards the use of mind mapping in learning and teaching vocabulary. In terms of questionnaire adaptation, 13 items remained and the order of these items was changed. Besides, 9 more items were added to meet the purpose of the study.

The questionnaire is comprised of 22 items in total. Each item includes a statement about students' attitudes towards using the semantic mapping technique in memorizing vocabulary on the Likert Scale (strongly disagree, disagree, neutral, agree, and strongly agree). All the items are categorized into three cluster including (1) students' interest in memorizing vocabulary with

semantic mapping, (2) students' attitudes towards the benefits of semantic mapping on vocabulary memorizing, and (3) students' attitudes towards the feasibility of semantic mapping. The clusters of the items are shown in Table 4 below.

Table 4. Three Clusters of Items in the Questionnaire

Clusters	Items
1. Students' interest in memorizing vocabulary with semantic mapping	1, 2, 18, 20, 21
2. Students' attitudes towards the benefits of semantic mapping on vocabulary memorizing	3, 4, 5, 6, 7, 8, 9, 10, 11, 17
3. Students' attitudes towards the feasibility of semantic mapping	12, 13, 14, 15, 16, 19, 22

As Day and Bamford (2004, cited in Nguyen, 2007) explained, "using the students' first language also means that the information you receive has more chance of being accurate and complete". For the sake of the study, the questionnaire in a Vietnamese version was given to the students so that misunderstanding would be avoided. To ensure reliability, the researcher gave careful explanations about semantic mapping before the students began to answer the pre-questionnaire.

Piloting the questionnaire

Before officially used in the research, the questionnaire was piloted with forty-one students with the similar background and level of English proficiency to test the reliability of the instrument. The reliability of the piloted questionnaire was Cronbach's alpha (α) = 0.84. The results showed that the questionnaire on the students' attitude towards semantic mapping was reliable and could be used for collecting data for the study.

5.3 Interview on the students' attitude towards semantic mapping

It was stated above that the questionnaire was used to collect more in-depth information on the students' attitudes and interests that could not be directly observable. However, using only the questionnaire could not help the researcher explore complex data for numerous questions. Therefore, an interview was considered for this study. The interview was one of the most important data gathering tools in qualitative research. Interview could allow researchers to investigate phenomena that were not directly observable, such as learners' self-reported perceptions or attitudes (Gass & Mackey, 2000). Thanks to the interview, the researcher could achieve data from particular individuals by face-to-face meeting, which could assist the students by clarifying the questions or clearly define the students' responses.

The interview was designed to explore the students' attitudes towards semantic mapping technique as well as explain more comprehensive understanding of the results; therefore, it was given only to the students in the experimental condition after the treatment. Basing on the

questionnaire's result, the research chose nine students whose score was worse, unchanged and better after the experiment. The nine students were asked the six following questions:

1. In what way were you usually introduced to new words in English lessons?
2. Besides learning vocabulary in class, how do you memorize vocabulary at home?
3. Have you ever been taught vocabulary using the semantic mapping?
4. Do you think it is effective or ineffective to use the semantic mapping to memorize vocabulary?
5. Why do you think it is effective/ineffective to use the semantic mapping to memorize vocabulary?
6. Could you offer some suggestions on using the semantic mapping to memorize vocabulary more effectively?

The first three questions mentioned the frequency of using the semantic mapping to memorize vocabulary. The last three questions were for the students' attitudes towards the semantic mapping.

6 Data collection procedures

This section presents the procedures of the experimental research including (1) the procedure of implementing semantic mapping and (2) the procedure of data collection. The following Table 5 summarizes the procedures of the research.

Table 5. Procedures of the Research

Time	Research activities	Group(s)
Week 1	- Administering the selection vocabulary test	- 2 groups
	- Instruction of the semantic mapping technique	- 2 groups
Week 2	- Administering the pre-test of vocabulary knowledge	- 2 groups
	- Delivering the questionnaire before the experiment	- Exp. Group
Week 3-7	- Implementing the semantic mapping in the stage of teaching vocabulary	- Exp. Group
Week 14	- Administering the post-test of vocabulary knowledge	- 2 groups
	- Delivering the questionnaire after the experiment	- Exp. Group - Exp. Group
	- Conducting the interview	

6.1. Procedure of semantic mapping intervention

As shown in Table 5, the semantic mapping technique was applied only in the experimental group. During the five week experiment, each group had three forty-five minute periods every week. Both groups were taught vocabulary in each lesson. However, the experimental group was taught vocabulary with the semantic mapping while the control one was taught vocabulary without semantic mapping.

6.2. Procedure of data collection

The experiment was conducted during the second semester of the 2009-2010 academic year in Tran Quoc Toan high school, Dong Thap province. Table 5 above also presents the procedure of data collection. To collect relevant data on the two groups' vocabulary, the vocabulary knowledge tests were conducted before and after the study. In addition, the questionnaire was delivered to students in the experimental group before and after the study to check the changes in students' attitudes towards semantic mapping. Nine interviews were also conducted.

Administering the selection vocabulary test

In the first week of the experiment, the selection vocabulary test was administered in forty minutes to select a list of the target words for the study.

The tests of vocabulary knowledge were conducted to measure the students' vocabulary knowledge before the experiment and vocabulary retention after the experiment. In conducting the tests, time, scoring and the conduct of each part of the tests were some factors that needed considering carefully.

Firstly, the tests were delivered to both groups in the morning and at the same time to ensure that the tests were performed in the same setting.

Secondly, for the accurate results of the scoring, each test was independently scored by two raters, the researcher and her colleague. It was noted that the grading scores between the two raters were consistent.

Furthermore, the pre-test took place in the second week and seven weeks after the experiment students took part in the post-test. In each test, the first part and the second part were taken independently. Students were required to do the first part in twenty minutes; they, then, handed in the answer sheets. After that, the second part was done in twenty-five minutes.

Administering the questionnaire

The questionnaire was carried out to measure the attitude of students in the experimental conditions towards semantic mapping at the two points of measurement. To obtain reliable data, the questionnaire handed out students was the Vietnamese version. After delivering the questionnaire, the researcher gave careful instructions to the questionnaire items one by one. When the students encountered difficulty in understanding any particular items, they could ask the researcher for her help. It took the students twenty minutes to complete the pre-questionnaire and to check for any missed answers. The post-questionnaire was collected after a similar allotted time as was provided in the pre-questionnaire.

Administering the individual interview

The goal of direct interview was to gain some insight into the perceptions of a particular person in a situation (Powney & Watts, 1987). Therefore, an individual interview was conducted to each of nine chosen students in the experimental group so that the researcher could get more in-depth information of the students' perceptions of the implementation of semantic mapping technique. The researcher explained the purposes and the importance of the interview to all nine students identically. The nine students whose score was worse, average and better after the experiment were asked the six questions on their frequent using the semantic mapping to memorize vocabulary and their attitudes towards the semantic mapping. The length of the interview varied

from five to ten minutes. The students' answers were taken notes by the researcher for qualitative data analysis.

Results

1. Students' vocabulary knowledge between and within the two groups at the two points of measurement (from the vocabulary pre-test to the vocabulary post-test)

With the aim of measuring the students' vocabulary knowledge before the study and vocabulary retention after the study, the vocabulary knowledge tests were employed as the pre-test and the post-test. Before the experiment, the pre-test was used to measure the students' knowledge of the target words. Seven weeks after the experiment both groups of students took part in the post-test to measure how much knowledge of the learnt words they could retain after the experiment.

For grading the tests, each correct item was scored one mark. There were no minus marks for providing incorrect answers. Therefore, the scale for each word ranged from 0 to 1. The data from the tests was then transferred to SPSS for data analysis.

Before the students' vocabulary knowledge between and within the two groups was compared, the *Scale Test* was conducted to verify the reliability of the tests. The results are presented in Table 6.

Table 6. Reliability Coefficients of the Pre-test and the Post-test

Tests	Alpha	n (items)
Pre-test	0.7818	60
Post-test	0.9078	60

The tests were piloted before administering, thus the reliability coefficient of the pre-test was relatively high ($\alpha = 0.78$) and that of the post-test was very high ($\alpha = 0.9$). The results indicated that the tests were reliable instruments.

The following sections present the results of the students' vocabulary knowledge at the two points of measurement (before and after the study) (1) *between* the two groups and (2) *within* the two groups.

1.1 Students' vocabulary knowledge at the two points of measurement between the two groups

Firstly, the *Descriptive Statistics Test* was run to analyze the two groups' vocabulary knowledge (before the study) and vocabulary retention (after the study). Next, the *Independent Sample T-Test* was used to compare the mean difference in the students' vocabulary knowledge and vocabulary retention between the two conditions. The results of these tests are presented in Table 7 below.

Table 7. Students' Vocabulary Knowledge between the Two Groups before and after the Study

Tests	Conditions	N	Min.	Max.	Mean/word (M)	MD	SD
Pre-test	Control	30	.13	.60	.35	-.019	.979
	Experimental	30	.13	.77	.37		.118

Post-test	Control	30	.20	.68	.43	.083	.126
	Experimental	30	.20	.90	.52		.147

As shown in Table 7, the total mean score of the students' vocabulary knowledge of the control group ($M = .35$) and that of the experimental group ($M = .37$) were very low compared with the average in the scale of "0 as minimum" to "1 as maximum".

Comparison of the students' vocabulary knowledge between the two groups before the study

An *Independent Samples T-Test* was conducted to evaluate whether there is a significant difference in vocabulary knowledge between the control group and the experimental group. The test was not significant ($MD = -.019$). This result indicated that before the study students in the two groups did not differ from each other in terms of vocabulary knowledge of the target words. This result also matched the researcher's previous assumption that the initial level of the students' vocabulary knowledge of the two groups was the same ($t = -.705$, $df = 58$, $p = .483$).

Comparison of the students' vocabulary retention between the two groups after the study

Table 7 also shows that after the study the mean score of the students' vocabulary retention of the experimental group ($M = .52$) was much higher than that of the control group ($M = .43$). The *Independent Samples T-Test* showed that the mean difference ($MD = .083$) in vocabulary knowledge between the two conditions after the study was statistically significant ($t = 2.34$, $df = 58$, $p = .022$). The result meant that the post level (after the study) of the students' vocabulary knowledge between the two conditions was significantly different; the post level of the experimental group was higher than that of the control group. It might be concluded that the students in the experimental condition retained more meanings of the learnt words than those in the control condition.

1.2 Students' vocabulary knowledge at the two points of measurement within the two groups

The *Descriptive Statistics Test* and the *Paired Samples T-Test* were conducted to analyze and compare the mean scores of the participants' vocabulary knowledge within the two groups before and after the study. The results of these tests are reported in Table 8 below.

Table 8. Students' Vocabulary Knowledge within the Two Groups before and after the Study

Conditions	Tests	N	Min.	Max.	Mean/word (M)	MD	SD
Control	Pre-test	30	.13	.60	.35		.979
	Post-test	30	.20	.77	.43		.126
Experimental	Pre-test	30	.13	.68	.37		.118
	Post-test	30	.20	.90	.52		.147

Comparison of the students' vocabulary knowledge within the control group before and after the study

As shown in Table 8, the students' vocabulary knowledge in the control group changed after the study. The mean score of the students' vocabulary knowledge of the control group after the study ($M_{post} = .43$) was higher than that of this group before the study ($M_{pre} = .35$). The mean

difference ($MD = -.065$) was statistically significant ($t = -2.42, df = 29, p = .022$). It could be observed that the students' vocabulary knowledge of the words in the control group was slightly improved.

Comparison of the students' vocabulary knowledge within the experimental group before and after the study

Table 8 also shows that the students' vocabulary knowledge in the experimental group changed after the study. The mean score of the students' vocabulary knowledge of the experimental group after the study ($M_{post} = .52$) was higher than that of this group before the study ($M_{pre} = .37$). The mean difference ($MD = -.93$) was statistically significant ($t = -5.27, df = 29, p = .00$). This indicated that the participants' knowledge of the words in the experimental condition was significantly improved after the study. The result indicated that there was a significant change in the students' vocabulary knowledge in the experimental group after the study: the post level (after the study) was significantly higher than the initial level (before the study). It could be concluded that the students' vocabulary knowledge of the words in the experimental group was significantly improved after the study.

Figure 1. The Students' Vocabulary Knowledge in the Vocabulary Tests

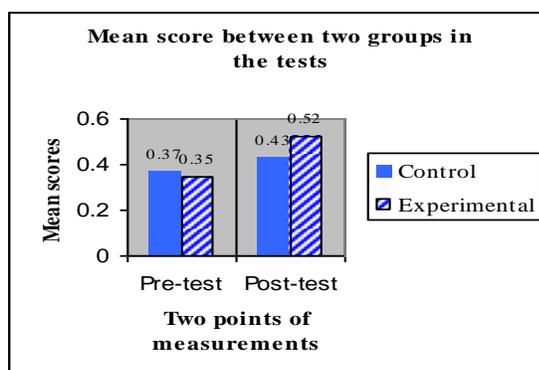


Figure 1 indicates that the participants in both groups gained more knowledge of words after the study. However, the students in the experimental condition ($M_{exp} = .52$) retained more than those in the control condition ($M_{con} = .43$).

2. Students' attitudes towards semantic mapping (from pre-test questionnaire to post-test questionnaire)

To obtain full understanding of the students' attitudes towards the semantic mapping technique at the two points of measurement, the researcher employed a questionnaire containing twenty-two statements. The students in the experimental condition answered the questionnaire according to a five-point scale ranging from *strongly disagree* to *strongly agree*. The data gained from the questionnaire were subjected to the SPSS for data analysis. A scale test was run to check the reliability of the questionnaire. The reliability coefficient for the pre-test was $\alpha = 0.84$. This demonstrated that the questionnaire was reliable.

2.1 Descriptive Statistics of the students' attitudes towards semantic mapping at the two points of measurement

Firstly, the students' attitudes towards the semantic mapping technique at the two points of measurement (before and after the study) were analyzed with the *Descriptive Statistics Test*. Table 9 below displays the results of the test.

Table 9. Descriptive Statistics of the Students' Attitudes towards Semantic Mapping at the Two Points of Measurement

Points of measurement	N	Min	Max	Mean(M)	SD
Before the experiment	30	2.73	4.36	3.43	.342
After the experiment	30	3.00	4.27	3.69	.347

It can be seen from Table 9 that the questionnaire mean score of the experimental group after the experiment ($M = 3.69$) is higher than that of the same group before the experiment ($M = 3.43$).

2.2 Comparison of the students' attitudes towards semantic mapping within the experimental group before and after the study

The *Paired Samples T-Test* was conducted to compare the mean difference in the students' attitudes towards semantic mapping before and after the study. The results are reported in Table 10.

Table 10. Paired Samples T-Test of the Students' Attitudes towards Semantic Mapping at the Two Points of Measurement within the Experimental Group

Paired Samples Test		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	MEANPRE - MEANPOST	-.2621	.38913	.07105	-.4074	-.1168	-3.690	29	.001

As shown in Table 10, the mean difference ($MD = -.26$) in the students' attitudes towards semantic mapping before and after the study was statistically different ($t = -3.69$, $df = 29$, $p = .001$). The result indicated that the level of the students' attitudes towards semantic mapping before and after the study was statistically different; the post level (after the study) was significantly higher than the initial level (more the study). We could conclude that the students in the experimental condition adopted more positive attitudes towards semantic mapping after the study.

3. Students' attitudes towards semantic mapping (from the findings of the interview)

After the study, besides the quantitative data analysis, some interviews were carried out to provide deeper insight into what the students thought about the use of semantic mapping. In addition, the researcher could identify and understand why the students came up to the results in

memorizing vocabulary. Nine students in the experimental group were respectively interviewed. These nine interviewees included three students with the worse scores, three with the average scores and three with the better scores in the vocabulary post-test compared with the vocabulary pre-test. In other words, they represented the three different levels of the vocabulary achievement as measured through the vocabulary tests.

As far as the interview was concerned, there are six questions structured to focus on the students' attitudes towards the use of semantic mapping introduced to their vocabulary memorizing. Generally speaking, nine students preferred memorizing vocabulary by using the semantic mapping.

Question 1: In what way were you usually introduced to new words in English lessons?

All of the students interviewed mentioned the lists of new words that their English teachers provided them by three main ways. Firstly, 55.6% shared the ideas that their teachers only directly wrote the word lists on the board with the instruction of pronunciation. An (pseudo-name) said *"The numbers of the new words in the lists are decided by teachers. Sometimes students had a very long word list which made up 10 to 15 words"* The second way to introduce the new words was using examples or using Vietnamese. Four students had the same ideas on this point. One of these four students confirmed that games or contexts were also used by teachers when having the students guess the meanings of the words. She added *"Games were funny but they could not deal with many words. Besides, contexts took us a lot of time to guess the right words."*

Table 11 below summarizes the percentage of the students that contributed the ideas of the ways that new words were introduced to them.

Table 11. The Ways that New Words Were Introduced to Students

Students' ideas about the ways of introducing new words by teachers	Percentage
1. directly writing word list on the board	55.6%
2. eliciting the words by examples or Vietnamese, then write the words into a list	33.3%
3. having students guess the words' meanings by using games or contexts	11.1%

Question 2: Besides learning vocabulary in class, how do you memorize vocabulary at home?

In the result it was noticeable that seven out of nine students (77.8%) were in favor of writing vocabulary on some small pieces of paper. They commonly stuck the word list on the board or on the walls in their houses so that they could memorize the new words whenever seeing the pieces of paper. Some often kept writing the words again and again until they could remember all of the new words. With the student who got the highest score in the vocabulary tests, English-Vietnamese magazines or stories were also helpful in learning the new words. She said *"I find new words in the magazines or stories, then I can learn from them but it is hard for me to recall the words without the context."* For one weaker student, he said he *"find a quiet place,*

concentrate on looking at the word list and learn both the English words and the Vietnamese meanings by heart”.

Table 12 sums up the ways students used to memorize vocabulary at home.

Table 12. The Ways Students used to Memorize Vocabulary at Home

The ways students used to memorize vocabulary	Percentage
1. writing words on some pieces of paper	77.8%
2. learning the words and their meanings by heart	11.1%
3. reading Sunflower magazines or English-Vietnamese stories	11.1%

Question 3: Have you ever been taught vocabulary using the semantic mapping?

Table 13 summarizes the students’ answers of whether ever being taught vocabulary by using the semantic mapping or not.

Table 13. The students’ Answers

The students’ answers	Percentage
No	88.9%
Yes, but didn’t know the name of the technique	11.1%

When being asked about whether ever being taught vocabulary by using the semantic mapping or not, the majority answered that they hadn’t been taught using this technique before. Only one student admitted that she was taught when she was in grade 9. However, she said *“At that time I was one of the students that were being trained to take the exam for students who were good at English. I was taught vocabulary by using this technique but I didn’t know its name was semantic mapping”*

Question 4: Do you think it is effective or ineffective to use the semantic mapping to memorize vocabulary?

All of the students acknowledged that the semantic mapping was effective for memorizing vocabulary. Some students also appreciated the value of the semantic mapping as not only *“effective”* but also *“interesting”*. One student explained that using the semantic mapping was interesting because it was *“logical”* and he *“can draw as many branches in the maps as possible”*. However, there were some thoughts raising some issues about using the semantic mapping. Some opinions were dealt with the time being acquainted with this technique because it *“takes a long time to know how to use this technique”*. One student said that *“it is critical for students who are not good at English”* and another added *“the semantic mapping requires an available amount of vocabulary from the users”*.

Question 5: Why do you think it is effective/ineffective to use the semantic mapping to memorize vocabulary?

The result showed that the students thought of the effectiveness of using the semantic mapping for memorizing vocabulary because of three main advantages. Firstly, 66.7% regarded the semantic mapping as an effective technique because it helped them memorize the words better, thus they retain the meanings of the words for a long time. The second advantage was that the semantic mapping was effective in the way that it strongly supported the students in easily reviewing the learnt words. Chuong said *“Whenever needing to recall the words learnt before, I imagine all the branches of a central word. Then the words with the related meanings come into my mind”*. One student who belonged to the high scorer group (11%) confirmed that logic was the last advantage. Actually, he said *“Thanks to the semantic mapping, I can improve my logic by putting the words with the related meanings into a map”*.

Table 14 summarizes of the advantages of the semantic mapping given by the students.

Table 14: The Advantages of the Semantic Mapping

The advantages of the semantic mapping	Percentage
1. helping the students retain the words better	66.7%
2. helping the students recall the words more easily	33.3%
3. improving the students' logic	11%

Question 6: Could you offer some suggestions on using the semantic mapping to memorize vocabulary more effectively?

It was interesting to note that 33.4% students were also in favor of using the word list. They suggested combining using the semantic mapping and the word list for memorizing vocabulary as *“only one technique is not helpful”*. Two out of nine students (22.2%) encouraged using the semantic mapping in reading lessons as *“the semantic mapping can help link ideas as well”*. Other suggestions on using the semantic mapping to memorize vocabulary more effectively were that *“the teacher should give a semantic map in Vietnamese as an example”* and *“students should have both English-Vietnamese dictionary and Vietnamese- English dictionary”*. They wanted both the time being accustomed to using the technique and the time looking up the new words when drawing a map *“to be limited”*. In addition, students needed the liveliness of the maps of words because they *“avoid a boring lesson with just charts and letters”*, thus they thought some more pictures should be presented in the semantic maps. One more interesting suggestion was that the teacher should ask students to stick their own semantic maps in the classroom as *“other students can learn more and more new words from their friends”*.

Table 15 summarizes the suggestions given by students on using the semantic mapping to memorize vocabulary more effectively.

Table 15 The Suggestions on Using the Semantic Mapping to Memorize Vocabulary More Effectively

The suggestions on using the semantic mapping to memorize	Percentage
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vocabulary more effectively	
1. combining using the semantic mapping and the word list for memorizing vocabulary	33.4%
2. using the semantic mapping in reading lessons	22.2%
3. giving a semantic mapping in Vietnamese as an example	11.1%
4. requiring both English-Vietnamese dictionary and Vietnamese-English dictionary for students	11.1%
5. adding some more pictures in the semantic maps	11.1%
6. sticking students' semantic maps in the classroom	11.1%

Discussions, Pedagogical Implications, Limitations, Suggestions for Further Research and Conclusion

1. Discussions

The main objective of this study was to find out whether or not semantic mapping had positive effects on students' vocabulary memorizing. The original hypothesis of the study was that semantic mapping would help students memorize words effectively and result in students' positive attitudes. The results of the study revealed some important findings in the students' vocabulary retention and the students' attitudes towards using semantic mapping.

1.1 The students' vocabulary retention

It can be seen that semantic mapping had positive effects on student's vocabulary memorizing. The results from the pre-test indicated that the control group and the experimental group had the same initial level of vocabulary knowledge. The results obtained from the post-test illustrated a significant change in students' vocabulary achievement in the experimental group whereas the students' vocabulary achievement in the control group only slightly improved. This showed that there was improvement in the vocabulary test in both groups; however, the experimental group outperformed the control one.

The results was consistent with the research conducted by Margosein, Pascarella and Pflaum (1982), Vogt (1983) and Pikula (1987) who found that semantic mapping had a greater impact on vocabulary acquisition. However, the studies carried out by the previous researchers compared the effectiveness of the semantic mapping and other techniques (context clue approach, the traditional dictionary-definition-plus-example approach, or the dictionary). In this study, the researcher compared the effectiveness of the semantic mapping and that of the word lists.

One reason for helping vocabulary memorizing could be the semantic mapping's effectiveness in visually integrating new words with old ones and promoting a deep level of semantic processing. Hague (1987) and Machalias (1991) stated that "meaningful exercises or classroom activities which promote formation of associations and therefore build up students' semantic networks are effective for long-term retention" (Hague, 1987; Machalias, 1991, cited in Sokmen, 1997, p. 249). Moreover, according to Schmitt (2000), presenting items to students in a systematized manner which will both illustrate the organized nature of vocabulary and at the same time enable students to internalize the items in the coherent way. Actually, the semantic mapping helped

organize words in a systematical way and created a semantic link between the words by the topics or by the ideas in the context. This required the students a deeper mental processing to find out the relations between the words and to build up a net of words. As a result, the students could remember the words right after the lessons, most of them could transfer the words they learnt into long-term memory and revised the semantic map created for consolidation. The improvement in memory, in turn, resulted in retrieval.

1.2 The students' attitudes towards using semantic mapping

The results from the questionnaire indicated that the students had positive attitudes towards the use of semantic mapping ($M = 3.69$, $t = -3.69$, $df = 29$, $p = .001$). Noticeably, the results obtained from the fourth and fifth questions in the interview showed that all of the students expressed their positive attitudes towards the use of semantic mapping.

Answering the fourth question about whether it is effective or ineffective to use the semantic mapping to memorize vocabulary, all of the students accepted that it is effective. However, one said that it required an available amount of vocabulary when using the semantic mapping. One agreed that it was critical for students who were not good at English. Two students admitted that it took them a long time to be acquainted with its usage.

With regard to question five: "Why do you think it is effective or ineffective to use the semantic mapping to memorize vocabulary?" the students had different ideas. Four of the students reported that the semantic mapping helped them summarize the related words to each other. Two said that thanks to the semantic mapping, they could review the known words when learning a new word while the other two could recall other words with the related meanings. Five of the students reported that the semantic mapping helped retain the meanings of the words for a long time. One said he could apply the semantic mapping into other subjects because he thought using the semantic mapping was logical in the way of putting the related words into a map.

One explanation for the students' attitudes towards using semantic mapping might be that the semantic mapping brought the students a new trial in their learning vocabulary. Teaching and learning vocabulary by using word lists made them bored and tired. Moreover, memorizing vocabulary using word lists hardly made progress in the students' vocabulary learning. In contrast, the semantic mapping used in this study attracted the attention of both the teacher and her students. For the teacher, it was one of the ways to present words logically. It was also a tool to check the students' understanding as it assisted them in summarizing the lessons on maps. For the students, they were provided a new strategy to learn vocabulary, which made them feel interested and motivated when working with words.

Besides, the semantic mapping created more interactions in the class. That might be another reason to explain why the students had positive attitudes towards using semantic mapping. The students themselves worked together to find out the relations between words, to create a nets of words and to enlarge their vocabulary knowledge. They also interacted with the teacher to get assistance for their learning. Interactions provided the students with opportunities to receive comprehensible input and feedback (Gass, 1997; Long, 1996; Pica, 1994) as well as to make changes in their linguistic output (Swain, 1995). In addition, the interactions in vocabulary

learning also indicated that vocabulary learning was no longer a student's self-study but one of the key concepts for language acquisition.

However, one student admitted that she felt it difficult to follow the construction of semantic maps and could not remember words well with maps. This could be explained that the instruction of how to use the semantic mapping was not always clear for all of the students in the study. This student might be misunderstood some stages of using the semantic mapping. Therefore, the teacher should be more careful in introducing the semantic mapping to the students. One more solution to help the student remember words better with maps could be encouraging her to involve in regular learning, using both the semantic mapping and the word lists if necessary.

2. Pedagogical implications

In this section, based on the findings in the gain in the students' vocabulary retention and the students' positive attitudes towards using semantic mapping, some implications might be considered.

First, the ultimate goal of vocabulary instructions is to help students become independent learners who have strategies for discovering, remembering, consolidating new words. This goal cannot be achieved without teachers' efforts. Teachers should motivate students in their vocabulary memorizing with different vocabulary tasks. They should provide students with not only vocabulary knowledge but also the strategies to access, to memorize and to consolidate the knowledge.

Second, to be effective, explicit vocabulary instructions should be dynamic and include a variety of techniques. Specifically, vocabulary instructions should (1) use both definitional and contextual information about word meanings, (2) involve students' activity in word memorizing and (3) use discussion to teach the meanings of the new words to provide meaningful information about the words. It is noticeable that students can use their mother tongue to discuss the meanings of the new words. In this case Dash (2000) explained that students' first language could be considered as a language tool that promote the process of L2 penetrating quickly.

3. Limitations of the study

Although the research has reached its aims, there were some unavoidable limitations.

First, because of the shortage of time, it was difficult for the research to reinforce the semantic mapping through the whole book. In addition, the implementing semantic mapping was short because it was conducted in the vocabulary teaching stage during five weeks. The time limit also resulted in a small size of population involved in the study. Therefore, in order to generalize the results for larger groups, the research should be extended its time and the study should have been involved more participants at different levels.

Second, the high school students' overloaded study might be the factor that affected the results of the study because the students were usually under study pressure from studying a lot of subjects.

Third, because of the time limit, there was only one test of vocabulary retention used in the present study. There should have had some progress tests or delayed tests to measure students' vocabulary memorizing in longer intervals of time.

4. Suggestions for further research

Based on the results of the study, it can be seen that the study achieved its goal to investigate the effects of the semantic mapping on students' vocabulary retention. However, it is necessary for further study to consider the correlation between motivation and vocabulary retention as well as to explore whether the semantic mapping results in greater students' motivation to learn vocabulary.

Besides, the present study suggests that future research should be conducted in ESP (English for Special Purposes) areas. It may examine the effects of ESP vocabulary instruction through the semantic mapping on students' vocabulary learning. In ESP training courses, besides language knowledge, vocabulary is the main focus. Moreover, in ESP courses, vocabulary is often presented in reading passages according to the topics, which are possible to integrate the semantic mapping in teaching and learning.

5. Conclusion

In this study, it was found that the hypotheses were confirmed. Introducing and having students practice using the semantic mapping was an effective way of enabling the students to achieve greater progress in vocabulary learning. As a result, the students had positive attitudes towards this method. The findings were not only consistent with the literature review but also supportive of the research on using the semantic mapping conducted before. This leads to the implication that the semantic mapping can improve high school students' vocabulary retention and is promising to vocabulary teaching and learning.

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The findings indicate that 1) the semantic mapping strategy was highly effective, 2) subjects in the experimental group, introduced to and taught by semantic mapping, were faster in memorizing the new vocabulary with its forms: definition, spelling, pronunciation, and recognition, 3) subjects in group (b) scored significantly higher in learning the new English vocabulary list than those in group (a), 4) subjects in the experimental group could recall the new English vocabulary list significantly longer, up to 60 % than those in the control group. Key words: semantic mapping, strategy, recall, Description of SM Semantic mapping generally refers to brainstorming associations which a word has and then diagramming the results (Sokmen, 1997, p. 250). Johnson, Pittelman and Heimlich describe it as categorical structuring of information in graphic form (1986, p. 779). Generally, SM has been used in the following ways: 1) for general vocabulary development, 2) for pre and postreading, 3) for the teaching of a study skill, 4) for a link between reading and writing instruction, and 5) for an assessment technique.Â The effects of instruction using semantic mapping on vocabulary and comprehension. Retrieved June 3, 2004, from ERIC oneline database. (ERIC Document Reproduciton Service No.