CHAPTER THREE

METHODOLOGY

This chapter presents the methodology adopted in this study. There are four sections in this chapter. The first section describes the subjects chosen in this study. The second describes the design of the instruments. The third describes different approaches used on three different groups. The fourth describes the details of the procedures used in this study. The final section presents the analysis of the data gathered from using the SPSS software.

3.1 Subjects

All the subjects in this study are the third-year students at the National Overseas Chinese Experimental Senior High School in Taipei County. Before entering this school, students have to take the Basic Competence Test, getting scores between 222-250; their English proficiency may not be significantly different. The main reason for choosing the third-year senior high school students as the subjects of the study is that most of them should possess the 2,000 basic English words and can effectively receive instruction using iconic-morphological approach via commonly-used roots.

For more than two years, the English teacher, Jen-ju Lu, has used similar teaching methods for her three classes: Class Yih, Class Ai, and Class Ping. These three classes are classified as follows: the definition-based group, the non-iconic morphological group, and the iconic-morphological group, each group with 27, 25,

and 39 students respectively.

To make sure that the subjects of the three groups have almost the same vocabulary size, this study performs the Levene's tests of homogeneity and an ANOVA test on their pre-tests. The statistics (in the next chapter) indicate that the pre-tests of the three groups show no significant difference. This means that the vocabulary size of the three groups can be viewed as equal.

3.2 Instruments

The instruments designed in this study include a vocabulary pre-test (see Appendix A), the immediate recall test (i.e., post-test 1, see Appendix B), the twenty-minute recall test (i.e., post-test 2, see Appendix C), the one-week recall test (i.e., post-test 3, see Appendix D), the one-month recall test (i.e., post-test 4, see Appendix E), and the 40-word vocabulary lists that are especially designed for the three groups (see Appendix F, G, H).

In the pre-test, there are nine sets of matching tests, each set of which is composed of five English lexical items and seven potential Chinese equivalents. To prevent students from guessing the meanings, two more Chinese distractors are added to each set. In addition, in the pre-test, the English words chosen from the six levels of the English reference word list possess reliability and empirical validity.[1] From each

---

[1] The English vocabulary list, compiled by Cheng et al. (2002: i) (sponsored by College Entrance Examination Center, in Taiwan), contains 6,480 words that are selected on the basis of the word frequencies and refer to three kinds of materials: (1) nine sets of junior and senior high school English textbooks in Taiwan; (2) five sets of American elementary school English readers; (3) twenty-one English word lists compiled in the U.S.A., the U.K., Canada, Japan, Mainland China, and Taiwan.

level of the word list, four short words and three or four long words are selected to comprise the pre-test, totaling up to 45 words.

In the immediate recall test (i.e., post-test 1), the matching tests are designed to examine only the subjects' awareness of the morphemes of the lexical items. This means the test requires no accurate spelling of the target words. In addition, there are six sets of matching tests, each set of which provides five English lexical items and seven potential Chinese equivalents. The total questions in the immediate recall test are 30, half of which are short words and half long words.[2]

The twenty-minute recall test (i.e., post-test 2) is designed to explore the students' short-term memory for unknown words. Half of the thirty questions are in the form of matching tests, which furnish fifteen English lexical items and twenty potential Chinese equivalents (i.e., five Chinese distractors), and half are spelling tests, which can study the subjects' spelling abilities and their application of the iconic-morphological learning via commonly-used roots in their vocabulary memorization. Seven short and eight long words are selected in both the matching and spelling tests.

To examine the long-term memory for words,[3] subjects have to take the one-week recall test (i.e., post-test 3) and the one-month recall test (i.e., post-test 4), whose questions are the same as those of the twenty-minute test (i.e., post-test 2), but are completely interwoven. Thus, the two recall tests can measure and discover subjects' level of long-term memory for words.

---

[2] The so-called long word must possess more than seven letters.
[3] The long-term retention must last for 24 hours or much more (Nation, 1982: 31).

For the teaching material, the forty words in the vocabulary list selected must be completely unknown to the subjects. Therefore, these vocabulary items are chosen either from Book Six,[4] which will be covered by the subjects during the next semester, or from the Sixth Level of the vocabulary list (compiled by Cheng et al., 2002).

3.3 Three Different Teaching Approaches

The three classes (i.e., Class Yih, Class Ai, and Class Ping) were divided into the three groups: the definition-based group, the non-iconic morphological group, and the iconic-morphological group, respectively. Then, the three groups received instruction using different teaching approaches with the same forty lexical items. Before instructions were conducted, the subjects were told that those who got the highest and the second highest scores could each get a book as an award. This attractive incentive motivated the subjects to become more involved in the teaching and learning of the vocabulary items.

3.3.1 The Traditional Definition-based Vocabulary Teaching Method

In the first control group, the instructor adopts the conventional definition-based vocabulary teaching method, the typical rote memory method. When new vocabulary items (See Appendix H) are taught, the instructor pronounces each target word first and the subjects are asked to repeat the pronunciation once or twice. Then the definition and translation of each new target word will be explained and its usage will

---

[4.] Book Six refers to the version of the Far East English Textbook used in Taiwan.

be described by putting the target word in the sentence context. Subsequently,

following the preceding instructions, subjects are asked to memorize new words on

their own. In this method, what subjects are required to do is to repeat the

pronunciation and to listen to the explanation of the definition as well as the

description of the usage of the new target words. This kind of instructor-oriented

approach, inconsistent with the four guidelines proposed by Carr and Wixson (1986),[5]

provides no further techniques to help students memorize new words.

3.3.2 The Non-iconic Morphological Approach via Commonly-used Roots

In the second control group, the subjects are first told about the following

concepts of the root, proposed by Johnson (1994: 71-72):

> (1) Every word has at least one root. (2) A root is that portion of a word that appears familiar both because you have seen it in other words and because it has meaning by itself. (3) Roots may be located anywhere in a word. (4) A root is often spelled slightly differently when used with different prefixes and suffixes than when it is spelled by itself.

Then, the subjects receive instruction using the morphological approach via

commonly-used roots to process the unknown words (See Appendix G). In other

words, the subjects can take better advantage of the structures or pronunciations of

similar commonly-used roots to help memorize similar difficult words. Therefore,

when encountering unknown words, subjects should always ask themselves the

following questions: "Do I know any words that look or sound like this unknown

word?" or "Are the look-alike or sound-alike words related to each other? " For

example, '*stal*' of the word *stalk* looks like '*steal*'. Besides, their meanings are related

to each other. Therefore, students can memorize the unfamiliar word "*stalk*" via

---

[5.] The four guidelines are proposed by Carr and Wixson (1986), see p. 11.

the commonly-used root "*steal*". In other words, subjects can apply

morphologically-based orthographic similarity and the core-meaning of morphemes to

their vocabulary memorization process.

Besides the application of morphologically-based orthographic similarity and

the core-meaning of morphemes, subjects can gradually relate the unknown words to

their known words following the destruction of the subjects' stereotype that English

vocabulary items are non-decomposable icons, just like Chinese characters.

Afterwards, the subjects will gradually develop and embed such a meaningful

learning procedure in their vocabulary memorization process.

Furthermore, Denning and Leben (1995: 94) state that readers can direct their

imagination to make the association with other words without completely and solely

abiding by the explanation of etymology. Therefore, vocabulary memorization does

not appear boring and insipid to learners, triggering their interest in vocabulary

learning as soon as they can practice the application of this approach.

3.3.3 The Iconic-Morphological Approach via Commonly-used Roots

In the experimental group, the subjects are given instruction using the

iconic-morphological approach via commonly-used roots to process the unknown

words. For example, subjects can memorize "spry" via its commonly-used root

"spring", or "plea" via "please" (See Appendix F). Besides, with the provision of the

icons, the unfamiliar words can be much more impressed and easily memorized. In

other words, the subjects receive the same morphological analysis and analogy

orientation; however, one group is taught using icons while the other group is taught

without using icons. With the aid of the icons, the subjects can memorize each new

word more easily and quickly. That is, the verbal description (i.e., the verbal memory

in the left hemisphere) and the iconic presentation (i.e., the visual memory in the right

hemisphere) of each unknown word can constitute a complementary and cooperative

function to subjects. Thus, within a limited span of time, the subjects of the

iconic-morphological group are able to embed the unknown words deeper into their

memory.

3.4 Procedures

     The process of the experiment was discussed with the subjects' English teacher

for more than two months prior to the start of the teaching program. The experiment

started until all the instruments were well prepared. The teaching program of the

experimental group started on November 4, 2003; those of the two control groups

started on November 3 and 7, 2003, respectively. In the beginning, the three groups

took the same pre-test for ten minutes. Following the pre-test, the same instructor (Ms

Jen-ju Lu) conducted different instructions to the subjects in each group for forty

minutes. Simultaneously, the subjects identified the forty unknown words through

different instructional methods. After the instructions of the lexical items had been

completed, the subjects took post-test 1, which aims to examine the subjects'

awareness of morphemes. This means that the subjects do not have to memorize the

accurate spelling of each unknown word and that they just have to recognize the

approximate orthographical appearance instead. Therefore, matching tests are

designed for post-test 1.

     After post-test 1, the subjects in each group were asked to memorize the whole

lexical items within twenty minutes; the subjects were asked to take post-test 2

immediately following this time allotment. The test, consisting of the matching tests

(15 questions) and the spelling tests (15 questions), aims to examine the subjects'

short-term memory for words.

After one week, the subjects in each group took post-test 3 to examine their

long-term memory for words; the results of the test could indicate the results of their

application of different vocabulary learning methods. Finally, the three groups were

asked to take post-test 4 after one month to examine their long-term memory for

words; the results are to be compared with the results of post-test 3.

The final step of this study is the analysis of the data collected from the subjects.

The next chapter will present the scores and the analyses of the pre-test and the four

post-tests.

3.5 Data Analysis

The data of the pre-test and the four post-tests are statistically analyzed in order

to explore the research questions proposed in Chapter One and to look for reasonable

explanations. Analysis is done using SPSS, where each table presents the mean,

standard deviation (SD), standard error of mean, mean difference, significance, degree

of freedom, etc. of the pre-test or of the post-tests for comparison and discussion.

First, both homogeneity of the pre-tests and the ANOVA test of the pre-tests

can prove the uniformity of the three groups. Then, the classification, the means, and

the ANOVA test of three levels (i.e., low, intermediate, and advanced levels) in the

iconic-morphological group respectively explore the variances of the three levels in

terms of awareness of morphology, short-term memory for words, and long-term

memory for words. Moreover, the ANOVA tests and the means of the post-tests as

well as of the correct spelling and similar spelling tests in the three groups prove that

the iconic-morphological approach via commonly-used roots is the best of the three vocabulary teaching methods by showing its significant effects on awareness of morphology, short-term memory for words, long-term memory for words, and correct spelling and similar spelling abilities. Finally, the correlations between each test of the three groups indicate the relationships of vocabulary size, awareness of morphology, short-tem memory for words, and long-term memory for words in relation to vocabulary memorization.

With the statistics of all the recall tests taken by the subjects of the three groups, the iconic-morphological approach via commonly-used roots can prove either useful or useless. If this approach is useful, the methodology can be adopted in vocabulary teaching and learning.