

Facilitating Vocabulary Learning with Pictures

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Jeong, Seong-Yeon. (2007). Facilitating vocabulary learning with pictures. *English Teaching*, 62(3), 27-53.

The purpose of this study was to investigate the effectiveness of using pictures to intentionally teach Korean high school students low frequency vocabulary. Additionally, it aimed to observe how the learning experience of being engaged with pictures promoted their retention of the target vocabulary. Moreover, this study has attempted to explore how Korean high school students use vocabulary learning strategies. Seventy students from a girls' high school participated in this study. All of the participants took a Vocabulary Levels Test (VLT) as a pretest and received a different treatment (target vocabulary list with pictures or without pictures) divided into two groups. After that, the posttest was administered to see how many vocabulary items they could remember from the treatment. To measure their retention ability in each group, the participants all took a delayed test after one month. Their vocabulary learning strategies could be found through a survey. The results of this study demonstrated that the students in picture group outperformed the students in non-picture group. In addition, picture group students displayed superior retention ability to non-picture group students. The participants were found to employ a variety of vocabulary learning strategies though no significant differences were observed between the groups.

I. INTRODUCTION

Human beings communicate with each other by means of language. By manipulating language freely, humans convey their messages and show responses, thereby ensuring their existence with other individuals. In order to express messages effectively and efficiently, we rely on one of the important linguistic components, vocabulary. The Oxford Dictionary of English (2003, p. 1028) defines *vocabulary* as 'the body of words in a particular language.' However, vocabulary could also be defined as including idioms, components, compounds, etc. (McCarthy, 1990). For this study, *vocabulary* is used to mean *words* as defined by McCarthy (1990): "...words as freestanding items of language that have meaning" (p. 3).

Furthermore, it is necessary to define the term *word* a little more specifically when the number of words is discussed. Schmitt (2000) used the term *word* to include *word families*¹. Following Schmitt's definition of a *word*, the term *word* is used as involving a *word family* in this study. Namely, for the purpose of this study, the term *vocabulary* is used as *word* and carries the two concepts that McCarthy (1990) and Schmitt (2000) stated above.

Since the 1970s, a number of studies (Cohen, 1987; Pressley, Levin, Kuiper, Bryant & Michener, 1982; Zimmerman, 1997) have focused on several methods to accelerate learners' memory of new words for *intentional vocabulary learning*. Some studies have extended intentional vocabulary learning to *incidental vocabulary learning* combined with reading in a variety of contexts (Chain & Lemmon, 2004; Knight, 1994; Prince, 1996; Paribakht & Wesche, 1999). In one methodological approach, some researchers demonstrated the effects of visual aids for vocabulary learning (Bazeli & Olle, 1995; Kost, Foss, & Lenzini, 1999; Kreidler, 1971). Longman Dictionary of English (2001, p. 1842) defines *visual aids* as 'something such as a map, picture, or film that helps people understand, learn, or remember information.'

For the present study, visuals could be understood as one of the teaching materials with various formats, from simple illustrations to multimedia, including teachers themselves. Various types of visual aids were employed for the previous studies, and they have demonstrated their efficacy in L2 vocabulary learning (Chun & Plass, 1996; Jones, 2004; Kost, Foss, & Lenzini, Jr., 1999; Nikolova, 2002; Pouwels, 1992).

However, only a limited number of studies (Hwa-Ja Lee, 1996) have been conducted for Korean students in Korean EFL classroom contexts with visual aids. Especially, research focusing on high school students' low frequency vocabulary learning with visual aids rarely carried out. Considering that Korean high school students are tasked with learning an increasing number of low frequency English words per academic year, the current study employed visual aids to facilitate their English vocabulary learning, and attempted to demonstrate the effectiveness of visual aids for their low frequency vocabulary learning. Also, it was meaningful to take a close look at the vocabulary learning strategies used by Korean high school students.

Therefore, this study aimed to examine the following three research questions.

- (1) How effective is it that Korean high school students learn new low frequency vocabulary with pictures?
- (2) How effectively do pictures help Korean high school students with retention of intentionally learned low frequency vocabulary?

¹ Schmitt defined a word family: "A word family is usually held to include the base word, all of its inflections, and its common derivatives" (2000, p. 2).

(3) What kinds of vocabulary learning strategies do Korean high school students use?

II. LITERATURE REVIEW

1. What Does it Mean to Know a Word?

What are learners required to know to learn words? Nation (1990) tried to answer this question using the concept of receptive and productive knowledge. Acquiring receptive knowledge means being able to recognize a word from the spoken form and the written form when it is used. It also involves being able to differentiate a word from other words in similar forms and to judge if it was used appropriately or not. Productive knowledge of a word involves knowing how to use it accurately in speaking and writing including receptive knowledge. Later, Nation (2001) developed his idea of knowing a word with the concept of form, meaning, and use. Thornbury (2002) explained that knowing a word involves knowing its form and its meaning. According to the author, knowing a word means knowing the spoken form, the written form, the meaning, the frequency of the word, the grammatical behavior, the word's derivations, the collocation of the word, the register of the word, and the connotations of the word. All are stored within an individual in a highly sophisticated organization and interconnection in the mind as a network, which is called the *mental lexicon*. Knowing a word is complicated; as a result, a large number of L2 learners rightly feel burdened by having to absorb a great deal of vocabulary and question how best to deal with this daunting task of learning new words (Gu & Johnson, 1996; Jones, 1995).

How many words, then, do L2 learners need to know? A frequently suggested number is 2,000 based on the fact that most native speakers use 2,000 words in their regular conversation (Thornbury, 2002). He also stated that it could be different depending on the learner's need. Schmitt (2000) stated that depending on the learner's objective, the number of words needed to learn could vary—2,000 words for regular conversation, 3,000 words for basic literacy skill of authentic materials, 10,000 for academic texts, and 15,000 to 20,000 for approaching an educated native speaker.

2. How Do Learners Learn Vocabulary?

Two of the most frequently used terms related to L1 and L2 vocabulary learning is *incidental* and *intentional learning* (Hulstijn, 2001). According to Hulstijn, the terms incidental and intentional learning have been used for almost ten decades and the meanings of these terms have also changed accordingly. The author described incidental vocabulary

learning as the by-product of any activity that the learner could learn by chance whereas intentional vocabulary learning as the result of any activity aiming at acquiring words explicitly (2001). Schmitt (2000) stated that vocabulary can be learned by making an effort explicitly to acquire or by being exposed to words in context incidentally. Therefore, it was suggested as appropriate that the most frequent 2,000 words need to be learned with explicit teaching while less frequently used words can be learned through an incidental learning approach where reading plays an important role providing chances to encounter a variety of words.

Thornbury (2002) emphasized the effectiveness of use, stating “putting words to use, preferably in some interesting way, is the best way to ensuring they are added to long-term memory; it is principle popularly known as Use it or lose it” (p. 24). McCarthy (1990) described the learner’s role in vocabulary learning and learner autonomy employing useful strategies of learning vocabulary. He noted that making a guess to infer the meaning of a word is one of the most frequently used strategies by learners, and that maintaining a personalized written form of vocabulary notebook is extraordinarily important to raise learners’ autonomy. Nation (1990) pointed out that there are many low-frequency words that are not frequently encountered and that are used in a narrower context; therefore, he put an emphasis on teaching vocabulary strategies to learners for greater efficacy.

To this point, a large number of studies related to vocabulary acquisition have explored effective methodologies since the 1970s. As one of the approaches was about vocabulary learning and teaching in context or out of context, which is still controversial among the researchers, it was observed that learners could memorize words better with only a target vocabulary list without context for tests, even though students showed rapid loss of memory of the target words (Oxford & Scarcella, 1994). McCarthy (1990) strongly believed that learning vocabulary in a meaningful context is more effective because the vocabulary presented in context could be better integrated so as to be remembered easily later. On the other hand, Zimmerman (1997) combined learning vocabulary in context through extensive reading with explicit vocabulary instruction (interactive instruction). As a result, learners who learned vocabulary through a teacher’s explicit instruction while reading self-selective materials out of the classroom showed a better ability to recall the vocabulary than the learners who read extensively only.

Some researchers have studied mnemonic techniques. *Mnemonics* was used to mean certain techniques that facilitate remembering something and successful mnemonics needed to contain a visual element and to be self-generated (Thornbury, 2002). The *keyword method* was one of the most effective mnemonic strategies (Thornbury, 2002), and it has been provided with positive evidence beyond other vocabulary learning strategies (Beaten, Gruneberg, & Ellis, 1995; Hall, 1988; Pressley et al., 1982). The keyword method is of two types; one based on employing visual images and the other on the construction of

sentences. The one with visual images showed superiority to the one with construction of sentences in accelerating recall of the target vocabulary (Pressely et al., 1982).

3. How Do Visual Aids Work in Vocabulary Learning?

Visuals are helpful in teaching since they arouse immediate response from the learners. They can be applied to the lesson in flexible ways for language teaching (e.g. essay writing, drilling, and listening) (Hill, 1990). Wright (1989) strongly believed that providing students with stimulus like pictures was necessary since “pictures contribute to: interest and motivation, a sense of the context of the language, a specific reference point or stimulus” (p. 2). Another advantage of visual aids is that they provide a context and facilitate retention (Mendelsohn & Rubin, 1995).

In terms of vocabulary learning, various visual aids were created and employed to prove their efficacy. Bazeli and Olle (1995) strongly believed that children can be highly motivated by visual aids when giving vocabulary instruction for reading. A classroom experiment investigated the relationship between learner’s styles (visual, auditory learners, parity learners) and the ability of short-term memorization depending on types of visual aids (pictorial visual aids, verbal visual aids, combination of pictorial and verbal aids) in foreign language vocabulary acquisition (Pouwels, 1992). The result showed that learning styles differentiate the vocabulary test scores according to the types of visual aids. Overall, the audiovisual materials facilitated short-term memorization regardless of the learner’s learning style.

Keeping pace with rapid advances of high technology in terms of computers and the Internet, Computer Assisted Language Learning (CALL) has developed, and researchers have extended their view employing visual aids for vocabulary learning accordingly. Therefore, not only in the classroom but also in the multimedia environment a large number of researchers (Al-Seghayer, 2001; Chun & Plass, 1996, 1997; Jones, 2004; Nikolova, 2002) have carried out empirical studies manipulating the conditions with various options. Especially, related to visual aids, because the multimedia environment could provide the ultimate circumstances to demonstrate visual images, it has garnered more attention. Here to this point, many studies have reported that visual aids strongly enhance learners’ learning and help learners remember vocabulary through stimulating the process of memory.

4. How Do Korean EFL Students Learn Vocabulary?

It is necessary to investigate how Korean students are coping with learning English vocabulary. Jun-Eon Park (2001) looked into vocabulary learning strategies that Korean

EFL learners use through conducting surveys. The surveys were completed by four different students age groups (elementary school, middle school, high school, and university students), and his study demonstrated several significant concerns related to Korean students' vocabulary learning. That is, Korean students showed a strong dependence on using bilingual dictionaries, and guessing the meaning of unknown words from the context even though these two might contradict each other.

Sohee Kwon's study (2004) of high school students also revealed that students' perception of strategies and their actual use were not congruous. 'Guess meaning from context' was mostly frequently used by students and 'ask classmates or friends for meaning' was the second most frequently applied one while they perceive 'guess meaning from the context' was the most useful and 'use bilingual dictionary' was the second most useful. When a teacher taught a vocabulary lesson in different languages (Korean or English), there appeared no significantly different test scores, but there existed a difference depending on the task types (Sohee Kwon, 2004).

Hwa-Ja Lee (1996) revealed that the results of an experiment aimed at investigating the efficacy of three different approaches of vocabulary instruction: definition approach, contextual approach, and a visual approach. It showed that instruction employing visual aids was the most effective among the other approaches not only for short-term memory but also for long-term memory.

Jeong-Won Lee and Nahk-Bohk Kim (2005) noted that Korean learners tended to perceive the meaning of English words with Korean equivalents as paired-translational equivalence, so they memorized words through mainly rote memory, and this perception was observed in the classroom activities for vocabulary learning. Therefore, they strongly suggested that vocabulary instruction needs to be alleviated through collocation teaching.

Through the review of past literature, it was uncovered how Korean students deal with vocabulary learning to improve their English. However, a relatively small numbers of studies have been conducted using practical ways to help Korean high school students' low frequency vocabulary learning. One of the reasons might be the pressure from the Korean Scholastic Aptitude Test (SAT). Taking this into account, finding a way to facilitate their English vocabulary learning more effectively is in need of further investigation. One possible way is making use of visual aids which are relatively easy and accessible for teachers and for learners. In this regard, the current study employed visual aids to facilitate Korean high school students' low frequency vocabulary learning and attempted to demonstrate the effectiveness of visual aids for their vocabulary learning.

III. METHOD

1. Participants

Seventy participants from two intact classes in a girls' high school participated in this study. One class (Group 1) consisted of thirty-four students, and the other class (Group 2) consisted of thirty-six; both classes were taught by the same female English teacher who has two decades of high school teaching experience. The study was independently carried out in each class with different treatments. The participants were asked to memorize the target twenty-four unknown low-frequency vocabulary items with pictures and without pictures. The data of sixty-nine participants were dealt in this study as one participant could not complete the whole process.

2. Materials

For this study, three kinds of tests were used: a pretest, a posttest, and a delayed test. In addition, a target vocabulary list with pictures, or without pictures, was used in the treatment. A survey of vocabulary learning strategy was completed by all the participants as well.

1) Pretest

Nation (1990) constructed the *Vocabulary Levels Test* which was 'the closest commonly accepted standardized test of English vocabulary' (Schmitt, 2000, p.174). Schmitt (2000) replaced the original test with two new equivalent versions (Test A and Test B) of the original test and validated them (Schmitt, Schmitt, & Clapham, 2001). Test A (Schmitt, 2000) was used for the present study. This test was composed of ninety items in five parts according to the word frequency levels (2000, 3000, and 5000 words, the University Word List, and 10000 words). Each frequency level included six sections and in each section six words were given with three definitions of words in a different column. Test takers matched each of the definitions with the words that had the same meaning in the section. In several previous studies (e.g., Cobb, 1997; Laufer & Paribakht, 1998; Schmitt & Meara, 1997), this test was used as a diagnosis test in order to assess learners' receptive vocabulary knowledge. Therefore, for the same purpose, the test was administered to both groups as a pretest in this study. As ordinary high school students' vocabulary levels could be considered relatively low to take all five parts of the test, only two parts of the test (2000, 3000 words level) were used. There were thirty items in each part, so the test comprised a total of sixty items.

2) Treatment Materials

For this study, forty-eight low frequency words were chosen randomly from the vocabulary list in a vocabulary book for SAT (Scholastic Aptitude Test) (Meltzer, 1999). To make sure that none of the participants had encountered these words before, the teacher who took part in this study, and two additional high school teachers were asked to review the selected forty-eight words and to indicate any words that had been taught in class or that they had seen in the teaching materials. As a result, ten words were dropped out.

The pictures employed in this study to enhance the degree of visualization of the target vocabulary were selected from a well-known vocabulary book (Meltzer, 1999) among students who have prepared for the Scholastic Aptitude Test (SAT) as a useful source of visual vocabulary materials. In order to choose pictures that reflected the meanings of the vocabulary accurately, forty-four graduate school students majoring in English Education in Seoul and four native English professors completed a questionnaire asking them to mark the degree of representativeness of each of the pictures on a five point Likert scale.

The top twenty-four words were selected from the questionnaires results and finalized as target words with pictures. These final twenty-four target words were presented with phonetic symbols, parts of speech, English definitions, example sentences, and Korean equivalents in the list for the treatment. For phonetic symbols, Korean equivalents, English definition, and example sentences, a variety of dictionaries were used and referenced: e4u English-Korean dictionary (2001), Essence English-Korean dictionary (2002), Longman Dictionary of Contemporary English (2001), Oxford Dictionary of English (2003), Oxford Collocations Dictionary (2002), Oxford Advanced Learner's Dictionary (2000). The participants in Group 1 and Group 2 received the same target words. The only difference between the two groups' materials was the pictures used in Group 2 (see Appendix 1).

3) Post- and Delayed Test

Immediately after the treatment, the posttest was administered to compare how many target words could be remembered by the two groups. Both the post- and delayed tests had twenty-four items, respectively, which were constructed by the researcher of the current study. To measure all of the target twenty-four vocabulary items, the twenty-four items were designed in three types: translation items, matching items, and choosing one sentence items (see Appendix 2). According to Nation (1990), treating words as independent units and devising tests that gauge if learners know what particular words mean was momentous. However, Read (2000) noted the importance of designing vocabulary tests in a meaningful contexts. Following both researchers, first two types were the traditionally well-known item types for vocabulary testing (translation and matching) treating vocabulary

independently out of context, and the last one (choosing one sentence) was designed for test takers to infer the meaning of the words in the context. One month after the posttest, a delayed test was administered to measure the recall of the target words.

4) Vocabulary Learning Strategy Survey

Right after the delayed test, all of the participants completed a survey (see Appendix 3). The vocabulary learning strategy survey was adapted from Language Strategy Use Survey (Cohen, Oxford, & Chi, 2001) which was divided into six strategies: listening strategies, vocabulary strategies, speaking strategies, reading strategies, writing strategies, and translation strategies. The survey included revised items from Oxford's strategy inventory for language learning (Oxford, 1990), and strategies identified and described by Cohen (1990). The vocabulary strategy section was translated into Korean. Because language difference could induce different results on the survey, the translated version was confirmed by a professional translator to ensure that there was no deviance from the original. The main part of the survey was designed to ask learner's vocabulary learning strategy under the four categories (to memorize new words, to review words, to recall words, and to make use of new vocabulary) using a five point Likert scale. Additionally, in order to discover the participants' general attitudes toward vocabulary in English learning, and their actual ways of vocabulary studying, the researcher added six more questions at the end of the survey.

The first category, which contained ten items, concerned what vocabulary learning strategies they use when they attempt to memorize new words. The second category, from number eleven to twelve, asked how they review words. The third was concerned with their strategies to recall words in the following three items, and the last category, items sixteen through eighteen, was meant to explore their strategies as a way of making use of new vocabulary.

3. Measurement / Scoring test

1) Pretest

One point was allocated for each correct answer and no points were given for an incorrect answer. For the test consisting of sixty items, the maximum score was sixty.

2) Post- and Delayed test

One point was given to each sixteen items under two types (matching and choosing one

sentence) and for the eight items under the last type (translation), 1 point was scored if the answer was perfectly correct and a 0.5 point was given if the Korean meaning was correct but the part of speech was not correct, or if the Korean meaning was similar. The scores in the three types were summed up for the total score. The delayed test was scored with the same method as the posttest. Therefore, the maximum possible score of the posttest and the delayed test was twenty-four each.

4. Procedures

For the pretest, on October 24th and 25th, Vocabulary Levels Test (VLT) was administered to both groups. The teacher provided instructions on how to complete the Vocabulary Levels Test (VLT) in Korean for ten minutes, and they took the test for twenty minutes.

About one month later, on November 25th, 2005, Group 1 was given the treatment with target words excluding pictures, and Group 2 was given the list including pictures. The both groups were given the treatment for forty minutes, including the teacher's instruction for ten minutes. As instructed, the target words were read aloud by the teacher, who explained their meanings. Following the instruction, the participants in both groups had thirty minutes to memorize the target words with the given example sentences and definitions in L2 and L1 equivalents in the lists. Immediately after the treatment, the posttest was administered by the teacher for ten minutes.

On December 23rd, the delayed test and the survey were administered for forty minutes to measure vocabulary items the participants could recall after one month without any previous notice.

5. Data Analysis

To see two groups' vocabulary knowledge were statistically equivalent or not, two groups' pretest scores were compared by independent samples t-test through SPSS 11.5. After the t-test, repeated measure of analysis of variance was conducted to examine the effect of treatment over times with identifying the within-subject factor was Time (post- and delayed test) and between subjects' factor was Group. The significance level was set at 0.05. When the means of the pretest scores of two groups were compared by t-test, the result appeared to be significantly different between two groups. However, the difference in the pre-test was adjusted statistically by assigning the pretest score as covariate through the repeated measure.

IV. RESULTS

1. Analysis of the Pretest

When the means of the two groups' pretest scores were compared, there was significant difference between the two groups ($t = -1.49$, $p = .014$) (Table 1). The mean of the pretest scores in Group 2 (picture) was statistically higher than that of the pretest scores in Group 1 (non-picture).

TABLE 1
The Comparison of Pretest Scores between Two Groups with T-test

Group	N	Mean	SD	t	df	Sig. (2-tailed)
Group1(non-picture)	34	32.38	12.89	-2.525	67	.014
Group 2(picture)	35	39.97	12.07			

2. Analysis of the Post- and Delayed Test

In order to find any significant differences between the two groups' posttest and delayed test scores, the repeated measure of analysis of variance was performed by assigning the pretest as covariate to be adjusted. The results are described in Table 2. The mean of the posttest scores of Group 2(22.01) was higher than that of Group 1(19.69). Table 3 shows the means of the posttest scores and delayed test scores after the adjustment. The mean of the posttest scores of Group 1 was 20.61(a) and that of Group 2 was 21.12(a). After the adjustment, the mean of Group 1 increased from 19.69 to 20.61 and the mean of Group 2 decreased from 22.01 to 21.12. Still, the mean of Group 2 was higher than the mean of Group 1. Finally, these adjusted means of the two groups were compared statistically in the repeated measure and the result is revealed in Table 4 and Table 5. There was an overall statistically significant difference between the two groups. Group 2 performed significantly higher than Group 1. Therefore, the treatment with pictures appeared to be more effective than that without pictures.

TABLE 2
The Means of Post- and Delayed Test

	Group	Mean	SD	N
Posttest	Group1(non-picture)	19.69	4.9098	34
	Group2(picture)	22.01	4.0575	35
	Total	20.87	4.6151	69
Delayed test	Group1(non-picture)	11.35	4.4236	34
	Group2(picture)	15.53	5.1306	35
	Total	13.47	5.2039	69

TABLE 3
The Adjusted Means of Post- and Delayed Test

GROUP	TIME	Mean	Std. Error
Group1	1(post)	20.61(a)	.60
	2(delayed)	12.18(a)	.70
Group2	1(post)	21.12(a)	.59
	2(delayed)	14.73(a)	.69

a. Covariates appearing in the model are evaluated at the following values: PRETEST = 36.2319.

The delayed test scores in both groups decreased as the participants' memory of the vocabulary declined after one month. Thus, the mean of the delayed test scores in Group 2(15.53) was higher than that of Group 1(11.35) (Table 2).

To verify that the difference originated from the treatment effect, the adjusted means of the delayed test scores after defining the pretest scores as covariates in the repeated measures should be compared. As Table 3 shows, after the adjustment, the mean of Group 1 increased from 11.35 to 12.18 and the mean of Group 2 decreased from 15.53 to 14.73. Next, the adjusted delayed test mean scores were compared in repeated measures and the output appears in the Table 4 and Table 5. They showed that there was a significant difference between the groups (non-picture group and picture group) and times (posttest and delayed test) respectively, which suggests that the means of the posttest scores and the delayed test scores between the two groups were significantly different, respectively, and that the delayed test scores were significantly different from the posttest scores in both groups.

TABLE 4
Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	MS	F	Sig.
Intercept	1143.664	1	1143.664	65.139	.000
PRETEST	1073.153	1	1073.153	61.123	.000
GROUP	73.595	1	73.595	4.192	.045
Error	1158.782	66	17.557		

TABLE 5
Tests of Within-Subjects Effects

Source of variance	Type III Sum of Squares	df	MS	F	Sig.
TIME	152.302	1.000	152.302	15.209	.000
TIME*PRETEST	3.117	1.000	3.117	.311	.579
TIME * GROUP	32.704	1.000	32.704	3.266	.075
Error(TIME)	660.934	66.000	10.014		

Greenhouse-Geisser

Finally, it was necessary to determine if there existed any interactions between the times and the pretest scores, or times and groups respectively. As Table 5 indicates, there existed no statistically significant interactions. Therefore, the result suggests that the Group 2 showed more retention of the new vocabulary than did Group 1. Thus, the treatment with pictures more positively affected learners' long-term memory.

3. Analysis of the Survey about Vocabulary Learning Strategies

To quantify the degree of their engagement of vocabulary learning strategies, five Likert Scale items were used. The participants were asked to mark the degree of their involvement (1 for least and 5 for most) using each strategy. Each category was analyzed independently. Table 6 reported the means and standard deviations on the ten items of each group under the first category to memorize new words in the order of rank.

TABLE 6
To Remember New Words in Group 1 and Group 2

Group 1				Group 2			
Strategies	N	Mean	SD	Strategies	N	Mean	SD
I often make a mental image of new words whose meaning can be depicted.	34	3.68	1.04	I often make a mental image of new words whose meaning can be depicted.	35	3.74	1.07
I tend to associate the sound of the word with the sound of a familiar word.	34	3.50	1.19	I tend to associate the sound of the word with the sound of a familiar word.	35	3.57	1.14
I may well practice new acting verbs by acting them out.	34	3.15	1.42	I often pay attention to the structure of part of the word or all of it.	35	3.40	1.14
I often pay attention to the structure of part of the word or all of it.	34	2.76	1.28	I may well practice new acting verbs by acting them out.	35	3.29	1.32
I sometimes learn a new word by listing it along with other words related to it by topic.	34	2.59	1.23	I often analyze words to identify the meaning of a part or several parts of them.	35	3.00	1.16
I often analyze words to identify the meaning of a part or several parts of them.	34	2.53	1.21	I often pay attention to the structure of part of the word or all of it.	35	2.94	1.37
I group the words according to the part of speech.	34	2.24	1.07	I sometimes learn a new word by listing it along with other words related to it by topic.	35	2.31	1.13
I sometimes use rhyming to remember new words.	34	1.97	.94	I sometimes use rhyming to remember new words.	35	2.11	1.02
I almost always write the new word in a meaningful sentence.	34	1.82	.97	I almost always write the new word in a meaningful sentence.	35	1.89	.99
I have a system for using flash cards to learn new words.	34	1.79	.91	I have a system for using flash cards to learn new words.	35	1.77	.77
Valid N (listwise)	34			Valid N (listwise)	35		

The results showed that the most frequently cited strategies common to both groups were “I often make a mental image of new words whose meaning can be depicted,” and “I tend to associate the sound of the word with the sound of a familiar word.” The least frequently cited strategies were “I have a system for using flash cards to learn new words.” “I almost always write the new word in a meaningful sentence,” and “I sometimes use rhyming to remember new words.” Mostly, both groups showed similar tendencies to make use of vocabulary learning strategy.

The result of the second category, regarding how they review words, shows the means and standard deviation of both groups, and it revealed little difference between the two groups (Table 7). It shows that when they review words, they tended to ‘go over new words often at first to make sure I know them’ rather than ‘go back periodically to refresh my memory of words I learned earlier.’

TABLE 7
To Review Words in Group 1 and Group 2

Group 1				Group 2			
Strategies	N	Mean	SD	Strategies	N	Mean	SD
I go over new words often at first to make sure I know them.	34	3.41	1.23	I go over new words often at first to make sure I know them.	35	3.00	1.19
I go back periodically to refresh my memory of words I learned earlier.	34	2.76	1.23	I go back periodically to refresh my memory of words I learned earlier.	35	2.86	1.24
Valid N (listwise)	34			Valid N (listwise)	35		

TABLE 8
To Recall the Meaning of Words in Group 1 and Group 2

Group 1				Group 2			
Strategies	N	Mean	SD	Strategies	N	Mean	SD
I will usually make an effort to remember the situation where I heard or saw the word, and if written, may even remember the page or sign it was written on.	34	4.21	.91	I will usually make an effort to remember the situation where I heard or saw the word, and if written, may even remember the page or sign it was written on.	35	4.00	1.16
I sometimes visualized the spelling of the new word in my mind.	34	3.29	1.06	I remind myself of a word meaning by first thinking of meaningful parts of the word.	35	3.58	1.22
I remind myself of a word meaning by first thinking of meaningful parts of the word.	34	3.15	1.40	I sometimes visualized the spelling of the new word in my mind.	35	3.37	1.21
Valid N (listwise)	34			Valid N (listwise)	35		

The result of the third category, asking about the way of recalling the meaning of words, revealed that both groups displayed a slightly different tendency of involvement as a matter

of the rank in each group. Regarding the statement “I will usually make an effort to remember the situation where I heard or saw the word, and if written, may even remember the page or sign it was written” both groups showed positive engagement. Group 1, however, showed (see Table 8) more favor on the statement of “I sometimes visualized the spelling of the new word in my mind” than the statement of “I remind myself of a word meaning by first thinking of meaningful parts of the word.” But Group 2 exhibited the reverse degree of engagement.

Table 9 shows the results of the last category, to make use of words, and it reveals that the students in both groups showed a negative inclination of using these strategies. At the same time, both groups displayed a degree of dependence on these strategies in the same tendency when it was viewed in the order of its rank respectively.

TABLE 9
To Make Use of Words in Group 1 and Group 2

Group 1				Group 2			
Strategies	N	Mean	SD	Strategies	N	Mean	SD
I use words just learned in order to see if they work for me.	34	2.53	1.31	I use words just learned in order to see if they work for me.	35	2.60	1.06
I make a real effort to use idiomatic expressions in the new language.	34	2.26	1.14	I make a real effort to use idiomatic expressions in the new language.	35	2.34	.97
I use familiar words in different combinations to make new sentences.	34	1.82	.83	I use familiar words in different combinations to make new sentences	35	2.14	1.00
Valid N (listwise)	34			Valid N (listwise)	35		

Overall, these two groups appeared to show a similar tendency of dependence on these vocabulary learning strategies.

Finally, an additional part of the survey asking learners how they studied vocabulary was analyzed. The result showed that the 12 learners (35.29%) in Group 1 (non-picture group) did not keep a personal vocabulary notebook whereas 8 learners (22.86%) did in Group 2 (picture group). Moreover, as Table 10 indicates, 18 learners (52.94%) in Group 1 perceived vocabulary studying as highly important for their English proficiency while 23 learners (65.71%) in Group 2 did. Both groups appeared to think much of vocabulary studying for their English. However, this could be interpreted as indicating that their perception does not coincide with the actual amount of time they study. Thirteen learners (38.24%) in Group 1 answered that they study vocabulary everyday or every other day while 18 learners (51.43%) in Group 2 did. In Group 1, 16 learners (47.06%) responded that they intentionally study more than 20 unknown vocabulary items a week whereas 20 learners (57.14%) marked in Group 2 (see Table 11).

TABLE 10
The Perception of Vocabulary Learning for Their English

	Group 1 (non-pictures)	Group 2 (pictures)
70~90%	18 (52.94%)	23 (65.71%)
50~70%	14 (41.18%)	11 (31.43%)
30~50%	2 (5.88%)	1 (2.86%)
10~30%	0 (0%)	0 (0%)
Total	34 (100%)	35 (100%)

TABLE 11
The Number of Vocabulary They Learn Intentionally for a Week

	Group 1 (non-pictures)	Group 2 (pictures)
Less than 10 vocabulary	9 (26.47%)	6 (17.14%)
11~20 vocabulary	8 (23.53%)	9 (25.71%)
21~30 vocabulary	6 (17.65%)	2 (5.71%)
31~40 vocabulary	6 (17.65%)	8 (22.86%)
More than 40 vocabulary	4 (11.76%)	10 (28.57%)
No response	1 (2.94%)	0 (0%)
Total	34 (100%)	35(100%)

V. DISCUSSION

As for the first research question: “How is it effective that Korean high school students learn new low frequency vocabulary with pictures?” the results of this study revealed that pictures did produce a statistically significant difference in recalling the target words for a short-term period. This finding lends itself to the usefulness of visual aids for low frequency vocabulary learning. A large number of past studies employed the keyword method as prominently effective mnemonics. In this sense, visual images played important roles in this method and, therefore, the engagement with visual aids appeared to support better memorization. It corresponds to the finding of the previous study (Hwa-Ja Lee, 1996) employing visual aids for Korean learners’ vocabulary leaning as well.

In respect to retention, relating to the second research question, the participants who used pictures showed superiority in recalling the target low frequency vocabulary for a longer-term period to those without pictures. Considering that the final purpose of vocabulary learning is not remembering the vocabulary just for a short-term period, it is obvious that understanding the process of memory storage and its organization for long-term storage is necessary while trying to find out how to enhance retention ability. Considering the fact that learning strongly involves remembering, it has become evident that the visual aids activate the process of memory through formulating and stimulating mental image in low frequency vocabulary learning. As already demonstrated in

Nikolova's (2002) study with pictorial annotations in a multimedia environment, the visual aids activate the memory process so that the information can be stored not only in the short-term but also in the long-term store.

Lastly, concerning the final research question of Korean high school students' vocabulary learning strategies, the results uncovered that Korean high school students are heavily reliant on the following strategy of "I will usually make an effort to remember the situation where I heard or saw the word, and if written, may even remember the page or sign it was written on" the most, and "I have a system for using flash cards to learn new words" the least. Previous studies (Eun-Jung Kim & Yeon-Hee Choi, 2005; Jun-Eon Park, 2001; Sohee Kwon, 2004) investigated learning strategies using different kinds of learning strategies though several overlapped. However, when the analyses of the surveys were compared, interestingly, the responses about using flashcards appeared to be congruous; the students responded that they rarely rely on the strategy making use of flashcards. The finding from this current study about flashcards also turned out to be unexceptional. Even though flashcards could be regarded as one type of the visual aids, students do not show strong involvement as they showed in "I often make a mental image of new words whose meaning can be depicted" since they might rarely have chances to learn words with flashcards as they get older and learners appeared to think using flashcards is not appropriate for their ages as Sohee Kwon (2004) noted.

VI. CONCLUSION

The purpose of this study was to investigate the effectiveness of using pictures to intentionally teach Korean high school students low frequency vocabulary. Additionally, it aimed to observe how the learning experience of being engaged with pictures promoted their retention of the target low frequency vocabulary. Moreover, this study has attempted to explore how Korean high school students use vocabulary learning strategies.

The results of this study demonstrated that students who learned new vocabulary intentionally with the aid of pictures outperformed students who did so without the aid of pictures. In addition, it was noticed that the participants who used pictures displayed superior retention ability to the participants who did not use pictures. As well, the participants in both groups were found to employ a variety of vocabulary learning strategies though no significant differences were observed. In sum, a group of Korean high school students remembered more vocabulary for a longer period when they learned with the pictures using various vocabulary learning strategies.

From the findings of this study, several meaningful conclusions can be drawn. First, it was inferred that students are aware of the necessity of intentional vocabulary learning for

the improvement of their English. However, their perceptions of vocabulary learning reflected insufficiently on their actual effort; for example, 11 students out of 69 (15.94%) answered that they 'never' study vocabulary on a weekly basis. Twenty students out of 69 (28.99%) responded that they do not keep a personal vocabulary notebook. Therefore, it would be desirable for teachers to encourage students to put more effort in vocabulary learning through demonstrating effective ways.

Secondly, through reviewing their answers for the open-ended questions asking about their own strategies which were not listed in the survey, it was revealed that the students appeared to develop their own vocabulary learning strategies according to their own characteristics. For instance, one student answered that she memorizes unknown words through singing, and another answered that she tries to remember the vocabulary through drawing her own version of pictures. It means teachers need to investigate current students' vocabulary learning strategies reflecting their individuality, and disseminate the findings to inform other teachers as Eun-Jung Kim and Yeon-Hee Choi (2005) have done. Furthermore, providing students with opportunities to be exposed to various vocabulary learning strategies are strongly recommended. Consequently, reflecting on the teaching techniques and assessing methods for vocabulary is also strongly recommended considering that students feel highly anxious about conventional vocabulary tests.

Finally, as the findings of the present study indicate, the picture group learners produced a higher level of vocabulary learning than the learners in the non-picture group. That is, the visual aids enhanced low frequency vocabulary learning since they encouraged learners to be engaged more in the process of memory. Additionally, by examining their responses on the survey, it was found that the students showed favoring attitude toward this experiment. An interesting response was "I feel like I could memorize them well with pictures. I could realize why my English proficiency is not high enough; since I didn't study hard so far." This shows that the experience through this experiment stimulated their vocabulary learning, which suggests that they can be more motivated through various visual aids.

Therefore, as these findings suggest, teachers can alleviate the pressure of intentional vocabulary learning that students feel by using visual aids effectively. It may become the preferable methods of vocabulary instructions. To facilitate this goal, teachers should utilize lots of sources from the Internet or other various authentic materials (e.g. magazines, newspapers, movies, TV programs). Not to neglect recent trends with high technology, use of any multimedia is also desirable for vocabulary learning as previous studies showed (Al-Seghayer, 2001; Chun & Plass, 1996; Jones, 2004; Kost, Foss, & Lenzini, Jr., 1999). Making use of Micro Office Power Point is one of the easily accessible ways to teachers to present new vocabulary with visuals.

However, before confirming the superiority of visual aids on vocabulary learning based on the findings from this study, there still exist quite a number of challenges that need to be

cautiously addressed. First, the effects of using visual aids could be more strongly supported by conducting an experiment with a greater number of participants and vocabulary items. Also, the pictures and words were selected through a certain procedure because certain words could be difficult to represent the meanings with pictures effectively; therefore, generalizing the result of this study to any words should be cautiously considered. In addition, if this study was carried out for a longer period, the findings could be interpreted more significantly and make the results more convincing. Second, pictures are usually more effective for visual learners than for auditory learners or tactile learners. Therefore, the potential variables in the participants' different learning styles might have an influence on the results of this study. It could be controlled through examining participants learning styles before implementing the treatment. Additionally, all of the participants were females. Gender difference might be one of the factors that could bring different results. Third, as Table 2 showed, the overall results of the post-and delayed test scores appeared remarkably high although the participants learned low-frequency vocabulary. For example, the mean scores of Group 2's post- and delayed test were 22.01 and 15.53 out of 24 respectively. This might be because of the form of the post-and delayed test. As appendix 2 shows, the participants could get the correct answers of eight items (choosing one sentence form) by guessing without knowing the meanings of the vocabulary with a fifty percent possibility. Last, the significance value was 0.045, which indicates statistically that the picture treatment was effective. However, if the picture treatment was offered to the participants in the other group, not to Group 1 but to Group 2, the results might be more persuasive to affirm the picture treatment effect with a higher significance value.

For further studies, the author of the current study suggests the following. In this study, the variables induced from the different gender, age, and levels of vocabulary knowledge were not covered. They could be revealed through further investigation. Additionally, this present study employed only black and white illustration pictures. It is desirable to compare how different the effect from different types of visual aids (e.g. photographs versus illustrations or pictures versus video). Moreover, the current study was limited to only intentional vocabulary learning; therefore, it is to be hoped that further research will examine this issue through combination with incidental learning.

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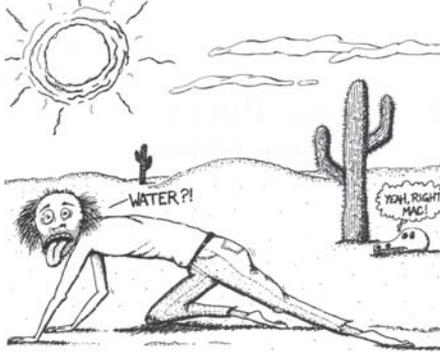
APPENDIX 1

Materials for the Treatment

1. arid [ˈæɪd] adjective

: (of a land or a climate) having little rain; very dry

Ex) I can't live any longer in this arid area.



형용사> 마른; 습기가 없는

2. glower [gl 'aʊ əɪ]verb

: to look at someone in an angry

Ex) He glowered at a taxi as it came to a noisy stop at the light.



동사> (불만, 노여움 때문에) 언짢은 얼굴로 보다. 무서운 눈초리를 하다.

24. □ With huge repidation, I put my head in the lion's big mouth. It was really scary.
 □ With huge repidation, I put my head in the lion's big mouth. It was really exciting.

APPENDIX 3

Vocabulary Learning Strategy Survey

* 아래에는 여러 가지 어휘학습방법들이 제시되고 있다. 각 항목을 읽고서 자신의 학습 방법 정도를 1부터 5까지로 V 표기하시오.

새로운 단어를 외우기 위해서

1. 난 단어의 일부분 또는 전체의 구조를 주의 깊게 살펴본다.

1	2	3	4	5
가장 그렇지 않다.		가장 그렇다.		

2. 나는 단어를 분석해서, 각 부분의 의미를 파악한다.

1	2	3	4	5
가장 그렇지 않다.		가장 그렇다.		

3. 나는 종종 모르는 단어를 품사(명사, 형용사, 부사 등등)에 따라서 분류한다.

1	2	3	4	5
가장 그렇지 않다.		가장 그렇다.		

4. 나는 새로운 단어의 소리를 이미 익숙한 단어들의 소리와 연관시키곤 한다.

1	2	3	4	5
가장 그렇지 않다.		가장 그렇다.		

5. 난 때때로 새로운 단어를 기억하기 위해서 라이밍(끝소리가 같은 단어)을 이용한다.

1	2	3	4	5
가장 그렇지 않다.		가장 그렇다.		

6. 난 종종 마음속에 그 단어의 의미를 어떤 연상되는 그림이나 이미지로 떠올려본다.

1	2	3	4	5
가장 그렇지 않다.		가장 그렇다.		

7. 난 때때로 한 주제하에 서로 연관이 되는 여러 단어를 분류/정리하면서 외운다.

1	2	3	4	5
가장 그렇지 않다.		가장 그렇다.		

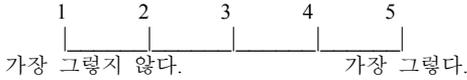
8. 나는 거의 항상 새로운 단어로 뜻이 통하는 문장을 만들어본다.

1	2	3	4	5
가장 그렇지 않다.		가장 그렇다.		

9. 나는 어떤 새로운 동작을 나타내는 동사를 배울 때 직접 몸으로 동작을 취해보면서 연습한다.

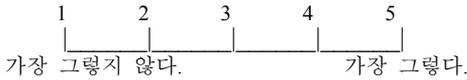
1	2	3	4	5
가장 그렇지 않다.		가장 그렇다.		

10. 난 새로운 단어를 배울 때 그림이 그려진 플래시카드를 이용한다.

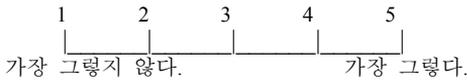


어휘를 복습하기 위해서

11. 난 새로운 단어들을 확실히 알게 될 때까지 여러 번 반복 학습한다.

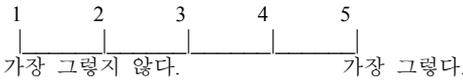


12. 난 주기적으로 예전에 배운 단어들을 학습한다.

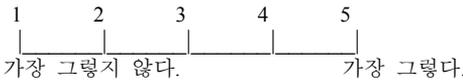


예전에 본 어휘의 뜻의 상기를 위해

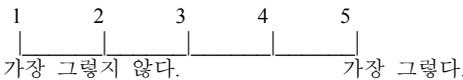
13. 난 단어의 뜻을 기억 해낼 때 가장 먼저 그 단어에서 어떤 뜻이 있는 부분들을(예를 들어 접미사, 접두사 등) 생각해보면서 전체 뜻을 기억해내려 애쓴다.



14. 난 항상 단어를 들었거나 보았던 상황을 기억해내기 위해서 애쓴다. 활자화된 경우에는, 단어가 적혀있었던 페이지나 표지판을 기억하려 노력한다.

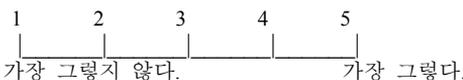


15. 난 때때로 새로운 단어의 철자를 마음속으로 시각화 시켜 본다. (그림처럼 머릿속에 기억해본다.)

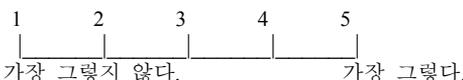


새로운 어휘를 활용하는 방법으로

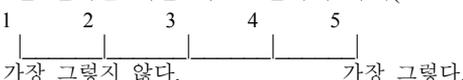
16. 난 방금 배운 단어가 제대로 적용되는지 보기 위해서 실제 언어생활에서 직접 이용 해본다.



17. 난 내가 익숙한 단어들을 가지고 여러 가지 다르고 새로운 문장들의 조합을 만들어 본다.



18. 난 새로운 언어를 배울 때 그 언어의 숙어(idiom 등)를 최대한 써 보려고 노력한다.



19. 위의 사항들 이외에도 본인이 쓰는 본인만의 특별한 어휘학습전략이 있다면 적으세요.

* 다음은 평소에 자신이 영어 어휘를 공부하는데 관련 방법에 관한 질문들입니다. 해당 되는 사항에 동그라미 하거나 해당사항을 적어주세요.

20. 평소에 영어어휘공부를 할 때 나만의 단어장을 만드는가? 예 아니오
21. 19번의 대답이 '예'라면 단어장에 어떤 항목들을 적는가?
(예시) 영어단어와 한국어 뜻만
22. 19번의 대답이 '아니오' 라면 그 이유가 무엇이라고 생각하십니까? (자유롭게 적어주세요.)
23. 영어어휘실력이 영어실력에 얼마나 영향을 준다고 생각되는가?
①70~90%의 영향 ②50~70%의 영향 ③30~50%의 영향 ④10~30%의 영향
24. 본인의 어휘실력을 향상시키고자 집중적으로 어휘 공부하는 횟수는 얼마나 된다고 생각하는가?
①날마다 공부한다. ②격일에 한 번 정도③일주일에 한 두 번 공부 ④전혀 안 한다.
25. 일주일에 평균 몇 개의 단어를 외운다고 추정되는가?
①10개미만 ②11~20개 사이 ③21~30개 ④ 31~40개 ⑤40개 이상
26. 이번 연구논문 실험에 참여하면서 본인이 느낀 점이나 생각 등을 자유롭게 적어주세요.

Application levels: secondary education

Key words: vocabulary learning, visual aids, vocabulary learning strategies

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Received in May, 2007

Reviewed in June, 2007

Revised version received in August, 2007