Mental Imagery: Is It Worth the Endeavour?

Nuttanuch Munsakorn

Bangkok University, Thailand
E-mail: nuttanuch.m@bu.ac.th

Abstract: *Based on current research and theory in various fields of study, mental imagery is believed as a specific type of memory aid which is most widely and effectively used. Unfortunately, in EFL language class, the learner received very little training in dealing with mental imagery as a mnemonic device. The point this paper wants to emphasize is that knowing the advantages of mental imagery will assist the learners to be able to apply this memory device on their own. To understand this point, a one-group experiment was conducted to point out some of the advantages of using mental imagery of Bangkok University's students in Thailand. It is hypothesized that the subjects will have better recall after being trained to utilize mental imagery in vocabulary learning. The results shed important light on the fact that the imagery which helps the students to enlarge and improve vocabulary knowledge independently. These results do not only show positive results, but also introduce an additional comment that the tools learners use to learn vocabulary should fit the situation in which the learners find themselves (Nist and Simpson, 2000).*

1. Introduction

We know from many studies and our personal experiences that vocabulary knowledge is taken the most important part of language learning. The reason why vocabulary knowledge is important is that the learners with limited vocabularies usually have difficulty in reading and spend more energy and time in reading activities or tests. As EFL instructors, we have found that memorizing vocabulary is one of EFL learner's weakest points. Moreover, the learners who memorize without understanding of vocabulary find themselves confused during reading tasks and frustrated of mixing words and definitions. Since there are many words that the learners have difficult time learning and remembering, they need memory tools that help them to improve their memory. For educators, memory is the only evidence that something or anything has been learned (Banikowski et al., 1999). As illustrated by the picture below, the human brain has five functions: memory, problem solving, attention, speed, and flexibility, and memory function accounts for the majority part of the brain. The memory plays a vital role in the people daily activities including in learning. Consequently, scientists and educators are trying to unlock the secrets to enhancing people's memory (Banikowski et al., 1999).
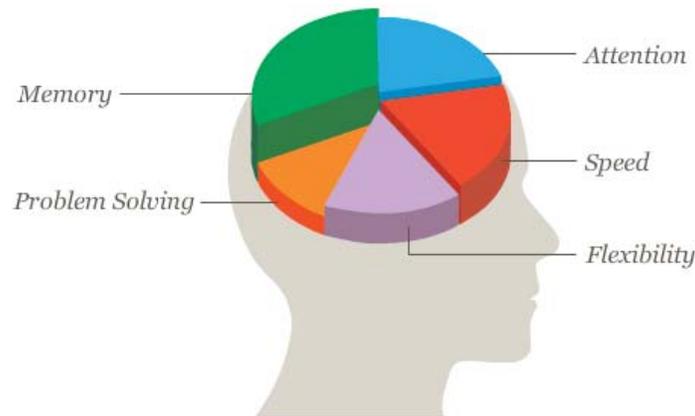

Figure 1: Brain Function
Source: http://www.lumosity.com/app/v4/personalization

Mnemonic systems are special techniques or strategies used to improve memory in that they store information in long-term memory and retrieve when needed. As a result, memorization becomes an easy task (Oxford, 1990). Additionally, mental imagery simply regarded as one type of mnemonics is used to remember association. In fact, new words can also be associated with a particularly vivid personal experience of the underlying concept, for example, a learner mentally connecting the word "snow" to a memory of playing in the snow while a child (Schmitt & McCarthy, 2009). Explained continuously, imagery deals with any of the five senses although visualization is one of the more popular for using with memory strategy. Using imagery or visualization to remember the definition of a word can be relatively easy, once you find an image that works for you (Davis, 1988).

In the EFL context, it is generally understood by the instructors that mnemonics are a variety of memory aids that help learners memorize vocabulary faster and retain it longer. Thus, to assist the learner incorporating new words that they want to remember and use later, the instructor should expose learners to mnemonics that they can use independently to increase their vocabulary knowledge.

Mental imagery is one of mnemonic devices considered as the most effective way to retain what people learned (White, 2011) so that the first thing is to be clear in one's own mind: how exactly mental imagery works. This question is indeed more complex than it seems. However, this was answered clearly by Thomas (2001), a cognitive scientist, describing concisely that our brain is designed to encode and interpret complex stimuli such as images, colors, structures, sounds, smells, tastes, touch, positions, emotions and language. We use these stimuli to make sophisticated models of the world in which we live in. Our memories store all of these very effectively (Thomas, 2001). This biological fact is more underlined by a memory expert showing the technique for remembering information is to code the information using vivid mental images. When the mental images are vivid, they are easy to recall when we need them (White, 2010).

Additionally, Thomas (2001) displayed that mental imagery is commonly defined as a form of experience: quasi-perceptual experience, an experience that subjectively resembles the experience we have when we actually perceive something. This implies that we are unlikely to be able to understand imaginable consciousness unless we understand perceptual consciousness (and perhaps vice-versa). However, it also, implies that imagery is always and necessarily conscious: if something is not consciously experienced, it cannot be mental imagery. As simply explained, the mental images are pictures in our minds which are associated with our own experiences.

The explanation makes clear in the context of EFL that learners can apply new words to their own experiences in the form of mental visualization or images, rather than remembering vocabulary meanings through words as they normally do. This view was emphasized by Bush (2007) proving that culture and vocabulary are widely accepted as important elements for language teaching.

Many discussions on mental imagery in different areas of study have been appeared over the years. That imagery is the most effective way to retain what people learned was revealed by a memory expert and two-time USA Memory Champion names White (2011). He also confirmed that imagery is the vocabulary learning process. People always associate words with something they are familiar with through their senses (White, 2011). By extension, this view is similar to Rossman (2012), a physician widely known for his pioneering work with guided imagery in the healing arts, insisting that imagery is a way of using our imagination, and it has countless potential benefits. It is in accordance with Campo and Fernandez (1995, cited in Fernandez et al., 2004), professors at Department of Psychology, University of Santiago de Compostela, Spain, finding that both normal and unusual students (students with mental retardation), who used imagery, obtained a higher level of recall than students who did not. Additionally, it has been indicated that mental images improve memory, as not only the word is stored, but also the image of the object is stored (Campos and Fernandez, 2004 cited in Fernandez et al., 2004). Like others, Nist and Simpson (2000), authors and educators at the University of Georgia, USA, said that imagery is the most widely used memory aid and benefits students more than other memory devices.

The use of mental imagery as a preferred method for facilitating vocabulary recall was clearly demonstrated by numerous research studies. For example, Paivio et al. (1979) gave evidence that imagery simultaneously facilitated both recall and comprehension. The study focused on 24 university students with some background in French as a second language who used an imagery-based hook mnemonic and rote rehearsal to learn sets of French words. He described that the hook technique involved associating the new items with an over learned series of French stimulus words and images, which could be retrieved during recall. Once again, the experimental evidence of the study of Paivio (1980) pointed out that mental images can be used as learning and memory aids in numerous tasks, including foreign language learning, for example, image program provides referential contexts for the language in the absence of the referent objects and situations themselves. Similarly, Vesely and Gryder (2007) found that the students personally used visual imagery as a tool to learn new vocabulary. One important finding from another research suggested that imagery technique is useful for school children who use mental imagery to facilitate their learning of arithmetic, spelling, and vocabulary (Roeckelein, 2004).

Switching the focus from the EFL to ESL context, the study of Uchiyama (2011) showed that character imagery (CI) in the story telling was found to be significantly greater in improving both comprehension and vocabulary development. This study provided evidence that teachers should employ suitable stories told using character imagery in English as second language classroom. In line with Keogh et al. (2009), they stressed in their study that pictorial elucidation helps learners comprehend and remember the meaning of second language idioms. The result also echoed that the meanings of English idioms were clarified to students with reference to the literal use of the expressions.

Another line of study showing information-imagery, processing techniques, Latin vocabulary acquisition, and memory retention helps to improve the participant's performance (Carter et al., 2001). Furthermore, the experimental study of Richard (1975) demonstrated that the mental imagery technique can be used with other techniques considered as the combination between keyword method and mental imagery. The result also echoed that imagery instructions have a significant advantage over sentence-generation instructions when the keyword method is used in Russian and Spanish vocabulary learning class.

Based on several experts in various fields of study and educators in language teaching, it is quite evident that mental imagery carries out huge positive results for the language learner. As researchers and EFL classroom instructors, it is essential that we investigate how mental imagery can aid EFL learning. For these reasons, this article focuses on the vocabulary development of students at Bangkok University, Thailand. Thus, the purposes of this paper are to investigate the advantages of the imagery technique in vocabulary learning. Methodologically, the research questions that we asked ourselves were as follows: 1) To what extent did the learners increase their vocabulary knowledge after being trained with imagery technique? 2) How did the learners respond to the use of imagery technique?

2. Methodology

Participants and Setting: The total sample consisted of 40 EFL male and female first-year students studying in faculty of Humanities majoring in English at Bangkok University, Thailand. 120 English major students as participant enrolled in the English for Expressing Idea course. The experiment was conducted during a regular class by the researcher and the researcher was also the teacher of these 40 participants.

Instruments: Two types of instruments were used in this study. 1) Two vocabulary tests are aimed at checking learner's vocabulary memorization; one functioning as a pre-test and another as a post test. Each test consisted of 40 vocabulary items selected from the course book: Skills for Success II (Reading and Writing), Oxford University Press, by McVeigh and Bixby (2011). As the pretest and post-test, the teacher constructed a 40-item teacher-made vocabulary tests, and the questions were based on the vocabulary taught in class. The 40 vocabulary questions of the pretest and post-test are different from each other. However, the vocabulary lists were different and the difficulty level is closely similar. Each test lasted 60 minutes and took place during class time. 2) A final self-report questionnaire invited participants to evaluate their views regarding the explicit strategy in-class training in week 5. The final questionnaire was administered in class in week 5 to monitor the effects of mental imagery strategy training over 3 weeks.

Treatment Procedure: The following procedures were adopted to meet the objectives of this study. The treatment was carried out in 5 sessions (5 weeks), each took 140 minutes.

Session 1, the teacher started teaching new 40 words in traditional way with clarifying the meaning in both English and Thai. Allow the participants 60 minutes to memorize words on their own by using the traditional method: reciting the words a few times and then move on to another word. In this session, there was no explanation or introduction of any vocabulary strategies. Then, allow 60 minutes to the participants to complete the vocabulary test (pre-test).

Session 2, a week later, concept, usefulness, and application of mental imagery technique were introduced and guided by the teacher. This week, the teacher introduced mental imagery technique (sometime known as mind's eyes) by modeling how to create a visual image in the time to recall words and definitions. Then, the teacher shared the image by describing things seen in mind to the participants. The teacher suggested that visual image seen in each participant's mind could be different depending on individual background knowledge or experience. The participants were suggested how to use a vivid images or extraordinary scenes or events to urge them to memorize words better, as shown in picture 2: A sample of mental imagery. Teacher also encouraged participants to visualize different images or situations involving the other new vocabulary words and to share thoughts about their imagined situations to their classmates.

Sessions 3-4, the participants were provided opportunities to employ the mental imagery technique in authentic vocabulary learning tasks on their own. In fact, they could activate their background knowledge.

Picture 2: A sample of mental imagery
Source: http://www.wikihow.com/Improve-Your-Memory

Session 5, the teacher launched a new 40-word list and let the participants 60 minutes to memorize the words and meanings by using mental imagery technique as trained for 2 weeks. Then, the second vocabulary test (post-test) and a 10-statement self-reported questionnaire were given to the participants.

3. Result and Discussion

The data obtained from this study were subjected to a number of statistical techniques including the basic descriptive statistics, such as mean (x), standard deviation (SD), and variance as shown in Tables 1, 2, 3 and figure 1.
To answer the first research question concerning the student's performance in using mental imagery technique, the paired t-Test was employed to analyze the data in this study as shown in Tables 1, 2 and figure 1.

Table 1. Pre-test and Post-test scores

Participant Number	Pre-test :Tradition Method (40 scores)	Post-test :Mental Imagery (mnemonic) (40 scores)	Participant Number	Pre-test :Traditional Method (40 scores)	Post-test :Mental Imagery (40 scores)
	21	36	21.	21	28
	18	29	22.	30	38
	12	28	23.	11	30
	17	34	24.	14	25
	28	38	25.	18	28
	27	38	26.	22	34
	12	28	27.	24	36
	25	34	28.	19	36
	30	40	29.	33	38
	23	38	30.	22	37
	29	40	31.	28	40
	12	30	32.	25	38
	16	32	33.	19	32
	18	32	34.	20	30
	24	38	35.	20	38
	33	40	36.	13	28
	19	29	37.	9	15
	34	38	38.	29	40
	37	36	39.	25	36
	36	38	40.	21	33
			Total	22.35	33.90

According to table 1, the results of the vocabulary tests indicated that 39 students (97.5%) obtained higher scores in the post-test completed in week 4 than in the previous test. However, only one student (2.5%), student number 19 whose score was dropped when compared to pretest. Notably, 5 students (12.5%), number 9,11,16,31, and 38 achieved the

highest score of 40 in the post-test. This means that mental imagery technique affects students' vocabulary memorization.

Figure 1: Students' Scores
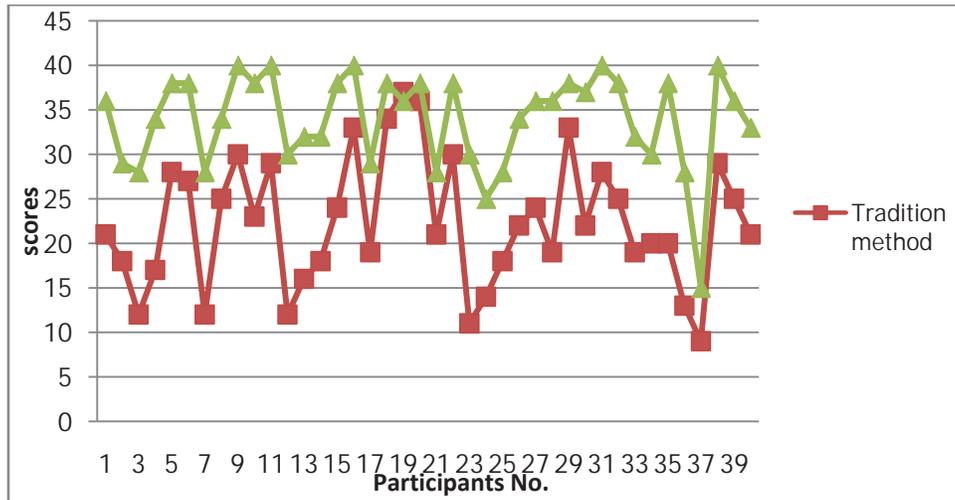
As illustrated in figure 1, it is noticed that the scores of 39 students were improved after the treatment administration, except only 1 student whose score was dropped. This means that the use of mental imagery technique has noticeably enhanced the student's vocabulary memorization.

Table 2: Mean of the pre-test and post-test of the students

	N	X	S.D.	t	Sig
Pretest	40	22.35	7.238	-16.377	.000
Posttest	40	33.90	5.315		

Additionally, the scores in the vocabulary test indicated that participants obtained statistically higher scores (p<0.05) in test 2 than in test 1, as illustrated in table 2. To put it another way, the means of these scores has considerably and meaningfully increased comparing to the pretest scores before the students were trained to use the mental imagery technique. It was concluded that mental imagery technique assisted the participants to recall word in self-regulated situations.

Taken in this light, memorizing words through the use of mental imagery technique could recall the new learned words much better than reciting one word to another. It was concluded that this memory device (mental imagery technique) likely improved the student's vocabulary memorization. The research reported here supported previous evidence that mental imagery can be used as memory aids in vocabulary learning (Paivio et al., 1979; Paivio, 1980; Vesely and Gryder, 2007; and Roeckelein, 2004). The results of this study are also in line with the studies that advocated the use of mental imagery to improve both comprehension and vocabulary development (Paivio et al., 1979; Keogh, B. et al., 2009; and Uchiyama, 2011).

To answer the second research question concerning students' reflection, a final self-report was employed to analyze the data in this study as reported in Tables 3.

Table 3: The Self-report Questionnaire

Statements: *By using mental imagery, ...*	Satisfaction	Unsusceptible	Dissatisfaction	Mean	SD
1. I can memorize words for a long term.	35 (87.5%)	5 (12.5%)	0 (0.0%)	2.88	.335
2. vocabulary size is expanded.	30 (75.0%)	10 (25.0%)	0 (0.0%)	2.75	.439
3. the vocabulary memorizing difficulty is decreased.	29 (72.5%)	11 (27.5%)	0 (0.0%)	2.73	.452
4. my creativity is stimulated.	38 (95.0%)	2 (5.0%)	0 (0.0%)	2.95	.221
5. memorizing new vocabulary is easier.	28 (70.0%)	10 (25.0%)	2 (5.0%)	2.65	.580
6. I can apply this technique not only memorize words, but also comprehend text.	31 (77.5%)	8 (20.0%)	1 (2.5%)	2.75	.494
7. I can associate new learned words with others in visualization.	39 (97.5%)	1 (2.5%)	0 (0.0%)	2.95	.316
8. I think this technique is useful.	40 (100.0%)	0 (0.0%)	0 (0.0%)	3.0	.000
9. I am relaxed in vocabulary learning.	40 (100.0%)	0 (0.0%)	0 (0.0%)	3.0	.000
10. I understand the word meaning faster.	29 (72.5%)	9 (22.5%)	2 (5.0%)	2.68	.572
Total				2.83	.412

Mean levels: 2.34-3.00 = high, 1.67-2.33 = moderate, 1.00-1.66 = low

The results of the self-report questionnaire showed that the overall mean score was at a high level (x=2.83, S.D.=0.412). This could explain that the students reflect their positive attitudes toward using the mental imagery technique in vocabulary memorization. The three highest scores of the participants' opinions fell on statement numbers 9 (I am relaxed in vocabulary learning.), statement umber 8 (I think this technique is useful.), statement number 7 (I can associate new learned words with others in visualization.) and statement number 4 (My creativity is stimulated) respectively. In other words, the participants think that mental imagery has three dominant advantages for recalling vocabulary accordingly: 1) the mental imagery technique helps them to memorize new learned vocabulary, 2) they feel relaxed when they memorize new vocabularies by using mental imagery, 3) the mental imagery can help them to associate the related words with targeted vocabulary in their minds and 4) the student's creativity is stimulated by mental imagery. The lowest score of the participants' opinion goes to statement number 5 (Memorizing new vocabulary is easier.). However, some participants rated "dissatisfaction" in memorizing new vocabulary easier (5.0%) and faster (5%), and student expressed that they can apply mental imagery technique to memorize words and comprehend text.

Table 3 also reported that the majority of participants (100%) found the mental imagery technique useful and relaxing. The data thus support the idea that improving memory is not exactly easy if the learners struggle with depression and anxiety. It is consistent with Darke (2008) who found that high level of anxiety reduces both the storage and processing capacity of working memory. Another linkage was proved by Kizibash et al. (2002), who proved that when depression was compounded by anxiety, there was not only an adverse effect on immediate recall and amount of acquisition, but also on the retrieval of newly learned information. In other words, when language learners feel more relaxed and less stressful, their language acquisitions will increase.

Furthermore, it is interesting to find that the participants can associate targeted words with some other related words in their mental visualization. These findings closely appealed the result of Richard (1975) showing that the mental imagery technique can be used as the strategy combinations between keyword method and mental imagery in language learning. The common thread running through these discussions is that the learners should use various kinds of strategies in language learning to be strategic readers. This view is supported by the study of Gu (2006), who believed that the combination of strategies is more effective than single strategy in people's learning.

Additionally, the data showed that the participants' creativity was stimulated by using mental imagery technique. In the same line with the previous research reviewed by Fareshteh et al. (2011) indicating a significant difference was found between creativity and language learning strategies. It is believed that mental imagery is beneficial for students to use their imagination and creativity for facilitating them in language learning, especially in writing and speaking English, not only memorizing new learned words.

It is concluded that mental imagery is useful and has high efficiency in vocabulary memorizing and recalling. Moreover, the result from the questionnaire showed that the students had a very high level opinion on satisfaction on using mental imagery. They also expressed that they feel relaxed when memorizing new words. In addition, their creativity is also stimulated. Based on the conclusions of this research, mental imagery helps the students to enlarge and improve vocabulary knowledge independently. It is strongly confirmed that mental imagery is worth for training in-class as a memory device instead of the rote memorization in vocabulary learning.

References

Banikowski et al. (1999). Strategies to enhance memory based on brain-research. http://scboces.org/english/IMC/FocusMemory_strategies2.pdf

Brain Function. http://www.lumosity.com/app/v4/personalization.

Bush, M. D. (2007). Facilitating the Integration of Culture and Vocabulary Learning: The categorization and use of pictures in the classroom. Foreign Language Annals. 40(4).

Carter, T. et al., (2001). Latin vocabulary acquisition: An experiment using information-processing techniques of chunking and imagery. Journal of Instructional Psychology. 28(4).

Darke, S. (2008). Anxiety and working memory capacity. Cognition and Emotion. 2(2). Doi.org/10.1080/02699938808408071.

Davis, J. (1988). Mental imagery. http://www.howtoimprovememoryhub.com/index.php.

Fereshteh, F. and et al. (2011). Relationship between creativity and language learning strategies in adult learners. Conference Proceedings. The third ICT international conference for language learning.

Fernandez, C. I. et al. (1995). The use of mental imagery in pair-associate learning in persons with Down's Syndrome. The British Journal of Development Disabilities. 50(98). 3-12.

Gu, Y. et al. (2006). Vocabulary learning strategies and language learning outcomes. Language learning. 46(4). 643-679. Doi:10.1111/j.1467-1770.1996.tb01355.x.

Improve your memory. http://www.wikihow.com/Improve-Your-Memory.

Keogh, BF. et al (2009). Does pictorial elucidation foster recollection of idioms? Language Teaching Research. 13(4), 367-382. doi: 10.1177/1362168809341505

Kizibash. A. et al. (2002). The effects of depression and anxiety on memory performance. Archives of Clinical Neuropsychology. 17(1). 57-67. Doi.org/10.1010/S0887-6177(00)00101-3.

McVeigh, J. (2011). Skills for success: reading and writing. Oxford University Press.

Nist, S. and Michael, S. (2000). Developing Vocabulary for College Thinking. Greg Ed. Simpson. Allyn and Bacon.5.

Oxford, R.L. (1990). Language learning strategies: What every teacher should know. New York: Newbury Houst Publishers.

Paivio, A. et al. (1979). Effects of an imagery mnemonic on second language recall and comprehension. Canadian Journal of Psychology /Revue canadienne de psychologie.33(1).17-28. doi: 10.1037/h0081699. http://psycnet.apa.org/journals/cep/33/1/17/

Paivio, A. (1980). Imagery as a private audiovisual aid. Instructional Science. 9. 295-309. doi 10.1007/BF00121763

Richard, C. A. (1975). Mnemotechnics in second-language learning. American Psychologist. 30(8). doi: 10.1037/h0077029.

Roeckelein, J E. (2004). Imagery in psychology: A reference guide. Westport, CT: Praeger.

Rossman, M. (2012). The Benefits of Imagery. Psych Central. http://psychcentral.com/lib/2007/the-benefits-of-imagery/.

Schmitt, N.; McCarthy, M. (2009). Vocabulary descriptive, acquisition and pedagogy. UK: Cambridge University Press.

Thomas, N. (2001). Mental Imagery. The Stanford Encyclopedia of Philosophy (Winter 2011 Edition), Edward N. Zalta (ed.), http://plato.stanford.edu/archives/win2011/entries/mental-imagery/>.

Uchiyama, T. (2011). Reading versus telling of stories in the development of English vocabulary and comprehensions in young second language learners. Reading Improvement. 48(4).

Vesely, P. and Gryder, N. (2007). Teaching Visual Imagery for Vocabulary Learning. Academic Exchange Quarterly. 11(2).

White, R. (2011). Imagery helps you learn a new language. http://www.memorise.org/brain-articles/imagery-helps-learn-language-001503.html.

White, R. (2010). How to improve your memory power. http://www.articlesbase.com/self-improvement-articles/how-to-improve-your-memory-power-1328871.html.