

The Effectiveness of Mnemonic Devices for ESL Vocabulary Retention

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Received: January 21, 2022

Accepted: March 14, 2022

Online Published: March 16, 2022

doi: 10.5539/elt.v15n4p6

URL: <https://doi.org/10.5539/elt.v15n4p6>

Abstract

The overall purpose of this study is to explore and understand how students acquire and apply new information (in particular, vocabulary) and how we as instructors can aid in this process. Communicative Language Teaching (CLT) as a whole tends to prioritize implicit learning but it is my belief that certain content can be understood more profoundly when presented in an explicit manner. This research seeks to determine the role of various mnemonic devices in the learning process and how effective they are for helping university students retain information in the English as a Foreign Language (EFL) classroom. Results collected from this experiment conclude that mnemonic devices can indeed improve a student's vocabulary retention and that Chinese EFL students prefer mnemonic techniques which bridge the linguistic gap between their native language and target language. In application, EFL instructors can utilize the findings of this research to raise a student's awareness of language learning techniques via explicit instruction and increase the volume of their vocabulary retention.

Keywords: explicit teaching, memory, metacognitive skills, mnemonic devices, vocabulary learning strategies

1. Introduction

1.1 Statement of Problem

Having worked in academia in mainland China for several years now, I have been able to observe how university students typically study English vocabulary. Some students sit with pen and paper and diligently write each word a hundred times, others scrutinize the pages of the dictionary and hope for the information to lodge into their memory. More recently, many students have taken up language learning apps which flash an English word and several pictures, prompting them to select the appropriate image. I surmise this to be a result of the rigorous high school education system which demanded that they quickly memorize vocabulary in preparation for the *gaokao* (university entrance exam), but never devoted time to developing effective study skills. As such, I believe students would benefit from being exposed to other study techniques such as mnemonics which could improve the efficiency of their studies.

Specifically, I will be addressing the topic of how explicit instruction concerning mnemonics affects an EFL student's ability to recall vocabulary. A cursory search reveals that this is not a new subject of analysis, however, I did notice a trend among these studies. The majority of experiments seem to primarily focus on one genre of mnemonic technique: visual. While visual mnemonics are certainly effective, there are many other types of mnemonic devices which can be utilized to recall vocabulary and I believe that the age group that I will be assessing (university level EFL students) possess the metacognitive skills to be able to comprehend a variety of techniques beyond just visual. Through conducting this experiment, I expect to address the following questions:

- 1) Does explicit instruction concerning mnemonic devices affect an EFL student's ability to recall vocabulary?
- 2) Do Chinese EFL students show a preference to a particular mnemonic technique (visual, mind palace (loci), rhyme, key word, sentence, acronym, or musical) when recalling information?
- 3) What are the learners' own perspectives on the usefulness and effectiveness of mnemonic devices?

1.2 Relevance and Application of Research

It is certain that most all English as a Foreign Language instructors have a common goal of helping their students improve their language abilities, and one metric of that improvement is that of vocabulary acquisition. Indeed, many students will have their language proficiency measured by the size of their lexicon at several points throughout their learning journey in the form of tests, exams, and other various forms of assessment. Many an instructor will work diligently to craft thoughtful lessons which increase a student's likelihood of remembering lexical items, however, how often do EFL teachers stop to consider how a student's personal study techniques may be affecting their ability to remember and recall vocabulary?

According to Mathison, when students were asked to self-report their current reviewing strategies, it was found that "the most common study technique reported by subjects in all groups was repetition, with few subtle variations including writing vocabulary words out multiple times or the use of flashcards." Moreover, when prompted with alternative examples of studying techniques, the majority of participants confirmed that they had little to no awareness of different approaches (2017).

This is a troubling conclusion, considering that research has found mere repetition to be one of the weakest forms of information acquisition. As Zhang and Lu note, "repetition and reviewing strategies alone do not promote lexical development" due to the fact that it requires one to learn vocabulary out of context (2015). With this understanding, I believe it can be understood why introducing students to alternative studying techniques and explaining how to craft mnemonic devices would greatly benefit their language acquisition. Acquiring such a skill is likely to improve our students' ability to retain and retrieve vocabulary, and also invoke a sense of agency and independence in their own language learning journey as they discover new pathways for engaging with the target language.

1.3 Literature Review

According to Lu and Newman Young (2015), mnemonics concerning vocabulary memorization can primarily be sorted into two categories: shallow-encoding and deep-encoding. The strategies of deep-encoding mnemonics, which focus on the semantic information of a word, are easy to find in the traditional classroom and often occur without explicit instruction. These include memorizing rules of morphology and etymology, repeated exposure to the word, relating a word to context through a sentence or image, and associating it with synonyms or antonyms. Shallow-encoding mnemonics, which focus on the spelling or phonological features of a word, include techniques such as homophonic, pronunciation, and familiar-word (key word) techniques. Instructors may struggle with explaining these types of mnemonics in the classroom due to their highly personable nature and the need to utilize creative thinking skills. For example, a Chinese-speaker learning English may devise the phrase *lao bu si de* (old but not dead) to remember the word 'lobster'. The phrase, beyond its phonological production, has no semantic relation to the vocabulary word that is intended to be memorized. Lu and Newman Young expound that such a technique could be extremely effective in this situation as Chinese and English are two languages which share very few cognates (2015).

Other research asserts that what may be more important than the encoding method itself is the process of organizing information so that it can be retrieved for use. One study explains that "meaningfully presented material is said to be not only easy to learn but also easy to retrieve; material presented 'isolated', conversely, is not only hard to learn but also difficult to retrieve" (Amoli, F. A. & Karbalaei, K., 2012). This research then continues to pontificate on the usefulness of mnemonics for long-term vocabulary retention. From this perspective, it could be argued that using mnemonic techniques gives students a meaningful situation to attach the learning experience to, allowing them to subsume and incorporate new vocabulary into their lexicon. It may be postulated then that it is the combination of organization, explicitness, and scaffolding of knowledge from learning mnemonic techniques which allows a student to retrieve vocabulary more accurately when necessary.

Another team takes a deeper dive into mnemonics in their research, not only satisfied to examine the results of a vocabulary test, but also seek to quantify the psychological impact on students who are exposed to this technique. They state that "the introduction of mnemonic techniques to the students made them realize that it can strengthen their memory" (Mohd Nazri et al., 2016). That is to say, that merely introducing students to the concept of mnemonics may have a positive washback on their learning process by increasing their awareness to information encoding possibilities. To assess this, Mohd Nazri et al. developed a questionnaire which was conducted before and after the experimental treatment to collect data on the participants' perception of mnemonics. From the participant feedback, it was found that not only did students feel they memorized more vocabulary in a faster amount of time, but also that they enjoyed using mnemonics more compared to traditional studying techniques.

Mohd Nazri et al. hypothesize that this increased enthusiasm for learning may be due to the autonomy and agency which students are able to employ when creating and using mnemonics (2016).

Each of the aforementioned research papers add to the wealth of information that we can now employ in the EFL classroom as instructors, yet still require a bit of synthesizing to string together these discordant strains of thought into one cohesive methodology. Lu and Newman Young assert that shallow-encoding processes may be more effective with Chinese-speakers learning English, but is that true? Amoli and Karbalaee argue that it is not the memorization technique that matters but the storage method which leads to meaningful learning and Mohd Nazri et al. conclude that merely being exposed to mnemonics will increase a student's ability to recall information. It is with this experiment that I hope to knit together the nebulous concepts broached in each of these research papers.

1.4 Hypotheses

From this research, I hope to confirm whether or not mnemonic devices are an effective tool for improving vocabulary retention among adult Chinese-speakers learning English as a foreign language, which type of mnemonic device they prefer, and also ascertain their attitudes to this learning technique. I hypothesize that 1) participants will perform better on vocabulary tests after being exposed to mnemonic techniques 2) participants will have a positive attitude towards mnemonics because they are generally quite fun to make and will be refreshing compared to the traditional study techniques that students are exposed to in the Chinese education system and 3) participants will favor image-based or musical mnemonic techniques; the former because Chinese writing is a logographic system and thus it will be quite natural for participants to make connections between images and lexical meaning, and the latter because Mandarin Chinese is a tonal language which allows one to surmise that participants are likely to have greater aural sensitivity to sounds.

2. Methodology

2.1 Design

This research is primarily quantitative and conducted via two instruments: a pre- and post-treatment vocabulary test and also a survey. The pre-test is conducted at the beginning of the lesson to assess participants' current study techniques. The post-test is administered after a 60-minute lesson in which the participants are taught various mnemonic techniques and have a chance to formulate their own mnemonics with the guidance of their instructor and peer feedback. The vocabulary test is designed to assess the subjects' ability to retain information after being exposed to mnemonic devices. The survey includes closed and open questions to determine their sentiments towards mnemonic devices.

2.2 Participants

The participants of this study include a diverse array of students at Hubei University of Technology in Wuhan, China. They range from freshman to post-graduate students and have varying academic backgrounds. The unifying theme for all of the students, however, is that they are not English majors. Though they have had exposure to the English language in an academic situation and have performed well enough on the *gaokao* (college entrance exam) in order to be admitted into tertiary education, they currently receive no English instruction outside of the course "English Pragmatics" which meets once a week for 90-minutes. The goal of this course is to provide an English environment for students to continue using their language abilities, lest they atrophy.

2.3 Instruments

The first instrument, which is administered at two different points, is a vocabulary test comprised of five multiple-choice questions, in which participants must match a vocabulary word with the appropriate synonym. The second instrument is a survey design to assess the participants' attitudes towards mnemonics. In addition, there is a PowerPoint presentation which is used during the experimental treatment to introduce the subjects to the concept of mnemonics and how such devices may be utilized in practical situations. The entirety of the instruments used for this experiment can be seen in Appendix A.

2.4 Assessment

The vocabulary test is comprised of five multiple choice questions. Different sets of words are used for each test to ensure that subjects do not use the information from the initial assessment to increase their performance in the secondary test. Before each test, participants are given the five vocabulary words as well as the dictionary definition and told they have five minutes to memorize this information. From that point until the testing is

completed, the instructor remains silent so as not to influence the participants' natural studying preferences. Below is an example of a test question:

Select the multiple choice answer that best matches the meaning of the bold word.

1. I wish you wouldn't be so **fastidious**.

a) mean b) pretty c) fast d) demanding

In an attempt to increase validity, the sentences are purposefully worded in such a way that there is no context that could give away the meaning of the word. This will increase the likelihood that participants are selecting answers based solely upon their own knowledge and not guessing based on textual clues.

The other instrument used in this research is a survey after the experiment is complete. There are closed questions such as "I plan to use mnemonic techniques in the future when I study" with the option of "strongly disagree", "disagree", "neither agree nor disagree", "agree", and "strongly agree". There are also open questions such as "When trying to remember the word 'fastidious', I used this technique..." and then providing space for participants to give a written response to explain their thought process.

2.5 Instructional Materials

The group of 20 participants are exposed to approximately 60-minutes of discussion and practice concerning memory and mnemonics via PowerPoint. The lesson starts with a general discussion about studying and how to improve memory (including physiological factors such as sleep, diet, and exercise). Participants then play an oral game which requires them to remember the word that the previous participant said as they add more and more information. Participants are prompted to think about how they remembered what each person said, and also to think about how they study and recall information in general. At this point, the pre-test is administered.

Following that, the lesson continues, now focusing specifically on different mnemonic techniques. The methods which I expose the participants to are musical, visual, acronym, sentence, rhyme, key word, and mind palace. After that, we consider a vocabulary word together and practice making a mnemonic device to remember its definition. Following this activity, the post-test and survey is administered.

2.6 Data Collection

The entirety of the treatment and data collection will take place over the course of a 90-minute lesson. The pre-test occurs at about 20 minutes into the discussion and the post-test and survey are conducted during the final 20 minutes of the lesson. Results are collected via an online platform which automatically assess and grades answers for accuracy. The pre- and post-tests will be compared to ascertain if there is an increase in accuracy of vocabulary retention after exposure to mnemonic techniques.

2.7 Data Analysis & Coding

A Microsoft Excel spreadsheet will be used to determine the means and standard deviations of the pre- and post-assessment scores of the participants from the vocabulary tests. This information will be converted to a table to display the data in a manner which is easy to interpret visually. A table will also be created to show the frequency at which each individual vocabulary words was missed to determine if there are any patterns. As well, a descriptive report will be compiled which includes the results of the survey.

3. Results

3.1 Pre-Test and Post-Test Results

The pre- and post-test both consisted of five multiple-choice vocabulary questions which were scored on a 0-100 grading scale. According to Table 1, the mean test score increased 9 points after being exposed to mnemonic techniques for remembering vocabulary. Sixty percent of participants received perfect scores of 100 on both the pre-test and the post-test. Eighty percent of participants saw no change in their score, having selected the same number of correct answers on both the pre-test and the post-test. The most dramatic individual improvement was that of participant HN, whose score increased by 60% after treatment. There were no downward trends in the post-test scores that would suggest that mnemonics had a negative effect on vocabulary retention.

Table 1. Pre-Test and Post-Test Comparison Chart

Participant Name Code	Pre-test Score	Post-test Score
KY	100	100
MA	100	100
WY	100	100
LI	100	100
BA	100	100
JY	100	100
CA	100	100
CE	40	80
EE	100	100
MY	80	80
LY	80	80
HN	20	80
JE	60	100
NY	100	100
EY	80	80
ZY	100	100
JS	100	100
HL	80	80
NA	60	100
LA	100	100
Average	85	94

Table B.1 (see Appendix B) is provided for transparency and also to elucidate the trends in the choices that participants made during the pre- and post-test. This data suggests that participants seemed to equally struggle with nearly all five vocabulary words during the pre-test but, for the post-test, there was predominately only one vocabulary word which posed a challenge.

3.2 Survey Results

Tables B.2-B.7 (see Appendix B) present the data acquired from the survey regarding the participants' feelings and opinions towards mnemonic devices. This data supports the hypothesis that participants would enjoy mnemonic devices (with 75% of participants agreeing or strongly agreeing with the statement that mnemonics are fun). As well, 90% of participants reported that they agreed or strongly agreed that mnemonic devices were not only enjoyable but also useful for studying. Seventy-five percent of participants agreed or strongly agreed that they would continue to use mnemonic techniques in the future studies. Seventy-five percent of participants also agreed or strongly agreed that they personally felt their ability to retain vocabulary increased after being exposed to mnemonic devise.

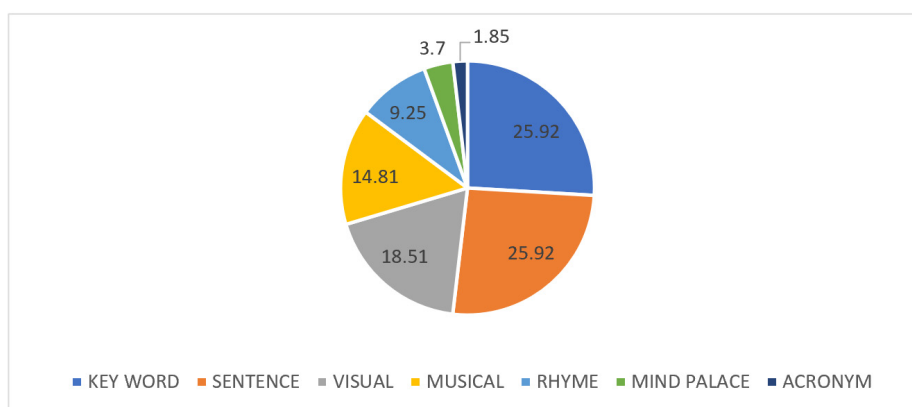


Figure 1. Mnemonic Technique Preference

This information was collected from the survey in a ‘select all that apply’ manner in response to the prompt “My favorite type of mnemonic technique is...”. On average, participants chose 2-3 techniques as their preference. The two most popular techniques, which were each selected 14 times, were the key-word method and the sentence method. The next most popular techniques were the visual method (selected 10 times) and the musical method (selected 8 times). The rhyme method was selected 5 times and the mind palace method was selected twice. The least popular technique, which was only selected once, was the acronym method.

4. Discussion

The above data supports the hypothesis that, not only would participants perform better on vocabulary tests after being exposed to mnemonic devices, but also that they would enjoy these techniques and find them to be fun tools for aiding their English learning journey. I was, however, incorrect on the matter of which types of mnemonics participants would prefer. I assumed that participants would predominately like musical and visual techniques, but the self-reported data suggests that the key-word and sentence methods were the most preferred.

The finding that participants favor the key-word method is supported by the research of Lu and Newman (2015), who suggested that Chinese-speakers who are learning English would prefer this shallow-encoding technique which “pays more attention to the word’s phonological or spelling features” rather than its semantic attributes. Because there are so little semantic commonalities between the English and Chinese language, these “shallow-encoding” techniques allow a student to forge a creative connection between these two systems which typically would not exist. Due to its ability to fill this linguistic gap, I would postulate that this may be why participants reported liking the key-word technique.

As for the sentence technique, I am less certain as to why it was preferred over other methods to such a high degree. It may be possible that participants enjoyed its versatility and ability to be adapted to any situation, as it was noted during the treatment that such a technique would also be useful in other contexts outside of language learning, such as studying the sciences. Further research is necessary to conclude the reasoning for this preference.

5. Conclusion

The concept of mnemonics has, arguably, been linked to the field of education since their inception. From the time Plato and Aristotle walked among the stoa of the Greek academies to present day pundits preparing for a speech, this is a memorization tool which has been utilized for centuries. The variety of different mnemonic devices make them particularly useful, as they can be adapted to suit the unique intelligence of each individual. For this research, I conducted a quantitative study regarding the utility of mnemonics in an English as a Foreign Language (EFL) context.

The results of this experiment conclude that mnemonic devices can indeed improve a student’s vocabulary retention on average by 9%. The preferred mnemonic techniques (key-word and sentence) of the participants are logical when considering the linguistic differences between English and Chinese, as these techniques allow the creator to encode a rich amount of information in a manner which bridges the gap between these two languages. The fact that participants did not favor the acronym method is also understandable when one remembers that the Chinese language does not lend itself well to the act of composing acronyms, and thus participants may have found this technique to be too foreign and too cumbersome to be useful.

The pedagogical implications of this research are manifold for EFL instructors, particularly among those who work with older students who are able to process such metacognitive techniques and also those who work among native Chinese speakers. It is my hope that this study may encourage all instructors to consider vocabulary learning as more than a tiresome, rote exercise and recognize the agency and creativity which can be introduced to a student's learning process via the incorporation of mnemonic devices.

As with all research, however, there are many follow-up questions which could be derived from this study. Why is it that participants preferred sentence method mnemonics? Would the results of the post-treatment vocabulary test be the same with a larger sample size? Would mnemonics still improve vocabulary retention after delayed exposure? Would we find similar results with younger participants who have not quite yet developed the metacognitive skills utilized in this sort of procedure? Moreover, could we credibly assert that it was the use of mnemonic devices which improved the participants' vocabulary retention, or was it merely the exposure to study techniques which primed their minds for test-taking and thus improved their scores? With future research and collaboration, such questions could certainly be addressed to expound upon the results of this experiment.

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Appendix A

Instruments

Vocabulary Pre-Test

1. I abhor going to the park.
a) feel b) lose c) hate d) love
2. He studies geology in his free time.
a) physics b) sports c) the Earth d) chemistry
3. The academy is very large.
a) spaceship b) factory c) school d) hospital
4. What an amazing apparatus.
a) movie b) magazine c) machine d) metal
5. Please draw some water.
a) collect b) drink c) freeze d) boil

Answer Key: 1. C 2. C 3. C 4. C 5. A

Vocabulary Post-Test

1. I wish you wouldn't be so fastidious.
a) mean b) pretty c) fast d) demanding
2. This movie is quite lugubrious.
a) boring b) sad c) interesting d) funny
3. I don't like their jocular attitude.
a) joking b) rude c) loud d) large
4. The doctor palpated the injury.
a) looked at b) diagnosed c) touched d) healed
5. The vernal season is my favorite.
a) spring b) summer c) autumn d) winter

Answer Key: 1. D 2. B 3. A 4. C 5. A

Post Treatment Survey

1. I usually find it difficult to learn English vocabulary words.
a) strongly disagree b) disagree c) neither agree nor disagree d) agree e) strongly agree
2. I used mnemonic techniques to study before today's lesson.
a) strongly disagree b) disagree c) neither agree nor disagree d) agree e) strongly agree
3. I plan to use mnemonic techniques when I study in the future.
a) strongly disagree b) disagree c) neither agree nor disagree d) agree e) strongly agree
4. For this question, you may choose multiple answers. My favorite type of mnemonic technique is...
a) Visual b) Musical c) Acronym d) Sentence e) Rhyme f) Key word g) Mind palace
5. Please describe your thoughts- When trying to remember the word "fastidious", I used this technique...
6. Please describe your thoughts - When trying to remember the word "vernal", I used this technique...
7. Please describe your thoughts- When trying to remember the word "jocular", I used this technique...
8. Please describe your thoughts- When trying to remember the word "lugubrious", I used this technique...
9. Please describe your thoughts- When trying to remember the word "palpate", I used this technique...
10. I have a positive feeling towards mnemonics and think they are a fun way to study.
a) strongly disagree b) disagree c) neither agree nor disagree d) agree e) strongly agree

11. I have a positive feeling towards mnemonics and think they are a useful way to study.

a) strongly disagree b) disagree c) neither agree nor disagree d) agree e) strongly agree

12. I felt I was better able to remember vocabulary words after being introduced to mnemonic techniques.

a) strongly disagree b) disagree c) neither agree nor disagree d) agree e) strongly agree

Appendix B

Supplemental Data

Pre-Test and Post-Test Data

Table B1. Pre-Test and Post-Test Vocabulary Accuracy Rate

Pre-test Vocabulary Word	Accuracy Rate %	Post-test Vocabulary Word	Accuracy Rate %
Abhor	85	Fastidious	75
Academy	100	Jocular	100
Apparatus	85	Lugubrious	100
Draw	75	Palpate	100
Geology	80	Vernal	95
Average	85	Average	94

Survey Question Results

Table B2. I usually find it difficult to learn English vocabulary words

Response	Frequency	Percent
Strongly disagree	1	5
Disagree	5	25
Neither agree nor disagree	6	30
Agree	8	40
Strongly agree	0	0
Total	20	100

Table B3. I used mnemonic techniques to study before today's lesson

Response	Frequency	Percent
Strongly disagree	0	0
Disagree	4	20
Neither agree nor disagree	8	40
Agree	8	40
Strongly agree	0	0
Total	20	100

Table B4. I plan to use mnemonic techniques when I study in the future

Response	Frequency	Percent
Strongly disagree	0	0
Disagree	1	5
Neither agree nor disagree	4	20
Agree	11	55
Strongly agree	4	20
Total	20	100

Table B5. I have a positive feeling towards mnemonics and think they are a fun way to study

Response	Frequency	Percent
Strongly disagree	1	5
Disagree	1	5
Neither agree nor disagree	3	15
Agree	12	60
Strongly agree	3	15
Total	20	100

Table B6. I have a positive feeling towards mnemonics and think they are a useful way to study

Response	Frequency	Percent
Strongly disagree	0	0
Disagree	0	0
Neither agree nor disagree	2	10
Agree	13	65
Strongly agree	5	25
Total	20	100

Table B7. I felt I was better able to remember vocabulary words after being introduced to mnemonic techniques

Response	Frequency	Percent
Strongly disagree	0	0
Disagree	0	0
Neither agree nor disagree	5	25
Agree	13	65
Strongly agree	2	10
Total	20	100

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