Using Mind Maps to Promote 12th graders' English Vocabulary Learning at a High School in Rural Areas

Hai, Dao Thi Vu

Chu Van An High School, Thai Binh province, Viet Nam

Abstract- Vocabulary acquisition is central to developing proficiency and competency in any language learning skill. However, many students face challenges in learning and retaining lexical items due to a lack of effective learning strategies. Therefore, the purpose of this study was to investigate the potentially significant effects of mind mapping on the vocabulary development of EFL high school students. The research design employed a combination of quasi-experimental research design, involving the participation of 95 Grade 12 EFL students from a high school in Thai Binh Province, Viet Nam. These participants were divided into two groups: the control group and the experimental group. Data collection for the study was conducted through a pre-test and post-test were administered to measure the student's progress in vocabulary acquisition. These assessments provided quantitative data to evaluate the extent of improvement. Secondly, a questionnaire was utilized to assess any changes in the students' opinions and attitudes towards vocabulary learning with the incorporation of mind maps. This quantitative instrument aimed to capture subjective perspectives and experiences. The study findings revealed significant positive effects of mind mapping on the vocabulary development of EFL high school students. Mind mapping not only inspired students to engage actively in vocabulary learning but also enhanced their ability to retain newly learned words for an extended period. The results suggest that mind mapping can be a highly effective strategy for vocabulary instruction.

Index Terms- vocabulary, mind map, high schools, teaching vocabulary, vocabulary learning.

I. INTRODUCTION

Nowadays, English is unquestionably the most popular language around the world. English is the language of science, computers, tourism, aviation, politics and so on. In Vietnam, English also plays a very important part because of the economic, social and cultural integration of our country. Being aware of the benefits of mastering English, more and more people are dedicating their time to learning English as a second language. Since 2008 the Vietnam Ministry of Education & Training has carried out the National Foreign Language 2020 project to effectively improve the quality of English learning and teaching in all school levels in Vietnam where English is a mandatory subject in the curriculum of secondary education. The importance of learning English can also be seen in the increasing number of learners in English-speaking centers nationwide and the parents' investment in high-priced English courses. Despite those struggles, Vietnamese students are incapable of communicating confidently due to a lack of vocabulary. In terms of a compulsory subject, in 2019 almost 70% of Vietnamese students scored below average in the national high-school English exam is a clear example that partially reflected their poor vocabulary knowledge. According to Schmitt (2000, p.55), "Lexical knowledge is to communicative competence and to the acquisition of a second language". Additionally, Wallace (1982, p.9) stated that "it is possible to have a good knowledge of how the system of language works and yet not able to communicate in it; whereas if we know the vocabulary we need, it is usually possible to communicate well." Both authors focus on the importance of vocabulary acquisition.

The fact that Vietnamese students still learn vocabulary in the wrong way makes students feel obsessed when they have to face up to long reading texts or lack of new words when they want to write essays or communicate with foreigners, which makes Vietnamese learners unconfident.

Students in 12th grade at Chu Van An High School, located in rural areas, face challenges in learning English due to limited access to English materials. Additionally, teachers often employ outdated methods, such as translation and dictation, to teach vocabulary, resulting in student disengagement and a lack of interest in learning English. Vocabulary acquisition poses a significant hurdle for these students, as they struggle to comprehend lengthy reading texts and effectively express their thoughts during speaking activities.

Teaching vocabulary is also a very vital factor in teaching language methods. How to help students learn vocabulary more effectively is a big concern for many teachers. Teachers always try to find ways to help students remember and use the new words appropriately. To tackle students' problem of poor vocabulary sensory, mind mapping is considered one of the most practical methods to enhance their vocabulary acquisition and retention. Though mind mapping is not new, many teachers and students do not know how to apply this approach to vocabulary acquisition. Moreover, few studies have been conducted on the application of

mind mapping to vocabulary teaching and learning in high schools in Viet Nam.

What makes mind maps a useful tool for learners to acquire English vocabulary is that mind mapping combines both sides of the brain. Visualization and creativity are tasks for the right brain. Reason and reasoning come from the left brain. From the reasons above, the writer is keen on writing this thesis namely "Using mind maps to promote 12th graders' English vocabulary at a high school in rural areas".

II. LITERATURE REVIEW

1. Definition of Vocabulary

There are various definitions of vocabulary. According to Oxford Word Power Dictionary (2006, p.788), vocabulary is defined as a) "all the words that somebody knows or that are used in a particular book, subject, etc.", b) "all the words in a language". In addition, vocabulary is "a core component of language proficiency and provides much of the basis for how well learners speak, listen, and write" (Richards & Renandya, 2002, p. 255). Diamond and Gutlohn (2006) also affirmed: "Vocabulary is the knowledge of words and word meanings."

Vocabulary plays a very important role in language learning. It contains all the vocabulary that is typically learnt with other language skills. Learners cannot understand the written text or express their ideas without having sufficient new words. Many researches have been carried out and many books have been written to discuss the importance of vocabulary acquisition. According to Laufer & Yano (2001), the obvious difference between foreign learners and native learners is the quantity of lexis that ones have. Similarly, Teng (2015, p.51) stated that "your vocabulary indicates the alertness and range of your mind. The words you know show the extent of your understanding of what's going on in the world. The size of your vocabulary varies directly with the degree to which you are growing intellectually". This emphasizes the vital role of learning new English words in the process of obtaining new knowledge. Vocabulary knowledge reflects the foreign language competence of learners. For students, learning vocabulary helps boost all language skills such as reading, writing, speaking and listening. Moreover, lexical knowledge also helps students get good grades in the National High School Examination. Therefore, the researcher believes that students understand clearly why they have to learn new English vocabulary.

2. Vocabulary Teaching and Learning

In the process of vocabulary teaching, if vocabulary is taught through conventional methods, such as translation and the distribution of synonyms and antonyms, it will not be as effective as vocabulary taught using tactics that allow students to develop vocabulary knowledge on their own. Schmitt (2000) and Nation (2001) contend that in order for students to expand their vocabulary, it is important to use vocabulary acquisition tactics outside of the classroom. According to Ahmed (1989), there are four basic categories of vocabulary acquisition techniques: (1) memorizing techniques, (2) practice and dictionary techniques, (3) note-taking techniques, and (4) group work techniques. Gu (2010) also makes it clear that there is a strong connection between vocabulary knowledge and the utilization of vocabulary acquisition strategies.

Being aware of the importance of learning vocabulary, learners try hard to find suitable methods for themselves. It is said that there are many ways to learn new words, but the writer just discussed two ways: implicit and explicit learning.

a. Implicit learning

Implicit learning is a term that is frequently used interchangeably with unintentional learning, incidental learning, and unplanned learning. This means that learners can get new words non-consciously and are not aware of what they have learned. That learners listen to English songs, watch American films or read English stories books such as Harry Porter, Horrid Henry, Diary of Wimpy Kid is an example of implicit learning. Therefore, vocabulary can also be learned implicitly. According to Krashen (1989), children who spend a lot of their free time reading books do better on school vocabulary examinations. In addition, implicit learning is not just in written form and it can be oral, visual or aural input. As a result, a large number of vocabulary is acquired by listening to news or stories or audio books or watching films. According to Milton (2009), oral input occurs when listening to music or watching movies in English.

b. Explicit learning

Explicit learning is a term that is often used with intentional and planned learning. This is also a good way that learners learn new words because they learn new words actively. According to Milton (2009), learners who are taught vocabulary explicitly in classroom activities acquire a larger vocabulary than those who only learn vocabulary implicitly. Therefore, learners that are explicitly taught will get competent at lexical knowledge.

Though whether implicit or explicit learning is more suitable for vocabulary learning or not was debated by the researchers, it is not easy to say which one is better. For 12th graders in Chu Van An high school, they are struggling to enhance their lexical knowledge because having a wide knowledge of vocabulary not only helps them get good grades in the final exams but also lay a foundation for their future career.

3. Mind Mapping

According to Buzan & Buzan (1993, p.1), Mind Mapping is "a powerful graphic technique providing a universal key to unchain the potential of the brain". This technique is like the process of thinking in which it allows us to change from this topic to another, from one side to another. It records the information by using symbols, images, colors and emotional meanings. Mind maps often include many colors, pictures and key words. Visual things can attract learners of all ages. The center of a mind map can be a key word or an image that stands for the topic of the mind map. Key information radiates out from the central image and continues to radiate to other branches. The branches are closely connected to one another.

Mind maps are beneficial to language learners in the process of acquiring language skills as well as boosting their creativity and memory. Firstly, mind maps encourage innovative thinking. They are an excellent tool to use while developing an idea for a project or term paper. Learners' creativity is encouraged and they come up with ideas more quickly when information is organized visually. Secondly, they aid in improving learners' memory. By making a mind map, they engage with the contents actively and attentively, which improves their ability to retain information. Thirdly, they boost efficiency. Mind maps simplify difficult ideas due to their simplicity and focus on apparent key words rather than

long passages. Using colors, illustrations, and sub-branches of the hierarchy, mind maps are a great tool for complex subject analysis of text, mind maps can help learners save a lot of time Buzan &Buzan (1993).

The following are some guidelines provided by Buzan (2004, p.194) for teaching mind mapping techniques:

Step 1: Create the primary image in the paper's middle as the first step. Add some color and something eye-catching.

Step 2: Sketch some fundamental ordering concepts from the main image.

Step 3: To find inspiration, list all the hilarious and attractive elements that are related to the main image.

Step 4: Using icons, graphics, and colors, add some branches to the fundamental ordering concepts.

Step 5: Consider the exciting details that might spark your attention.

Step 6: Continue doing that until your mental map is complete.

Below is a mind map from Buzan's (2005)

4. Previous Research

There have been previous research on teaching vocabulary with mind maps, Typically, Effendi (2004) conducted research to explore "Teaching vocabulary through mind mapping technique to the tenth-grade students of SMA Negeri 15 Palembang". She chose 80 students at random from 360 10th graders at SMA Negeri 15 Palembang in the academic year 2009-2010 for her study. She divided them into 2 groups called the control group and the experimental group, each of which has 40 students. In her thesis, she only used post-treatment testing. The result of the matched t-test was 2.396, which was higher than the t-critical value of 1.725. This showed that mind mapping approach was useful in the process of teaching vocabulary. Therefore, the researcher pointed out that other teachers should "create more relaxed atmosphere in the process of teaching and learning of vocabulary".

Having carried out research on 32 pre-intermediate students from Turkey's Selcuk University's School of Foreign Languages, Dilek and Yürük (2012) found out that mind mapping was an efficient tool in vocabulary instructions. They conducted a 40-item survey questionnaire before the main study in order to determine the association between the students' opinions and the methods of learning vocabulary that they preferred. In the primary research,

they split 32 students into two groups, of which 15 students are in the experimental group and 17 students are in the control group. The results of this "strategies in vocabulary-learning" questionnaire showed that students' beliefs about vocabulary learning strategies were closely related to their decisions regarding vocabulary learning. Additionally, the results of the t-test demonstrated that mind mapping was superior to conventional methods of vocabulary learning.

In Viet Nam, Diem (2011) conducted research on mental maps and diagrams using three different tools: questionnaires, interviews, and vocabulary tests. To investigate the effects of the research problem, survey questionnaires were given to 100 randomly chosen first-year mainstream students enrolled in the Faculty of English Language Teacher Education for the academic year 2010–2011. Pre-testing, two post-tests, semi-structured interviews, and trial lessons were all given to the thirty students who made up the control and experimental groups. Real experiments were conducted as part of the data collection procedures to reach the second goal of the study. The survey's findings indicated that although mind maps and diagrams had been utilized to teach vocabulary in Faculty I, they were not frequently employed. The outcomes of the next two tests (t obtained = 2.18 & t' obtained = 2.17) exceeded those of table t. (2.145). This demonstrated the value of employing mind maps and diagrams to teach vocabulary to first-year mainstream pupils, particularly in terms of word learning and memory.

Another research study entitled "Using mind mapping to teach vocabulary to the first year non-English major students at Bac Giang University of Agriculture and Forestry", was conducted by Lan (2012) at Bac Giang University of Agriculture and Forestry. In her study, she chose 90 students (42 males and 48 females at Bac Giang University of Agriculture and Forestry in the academic year of 2011 – 2012). Ninety students were surveyed using a questionnaire and a quantitative approach. The questionnaire's findings demonstrated that mind mapping could assist students in taking notes during lessons, coming up with new topic ideas, and summarizing the lesson's important points. Additionally, the results of a few short interviews revealed that employing mind maps to teach vocabulary to first-year non-English major students at Bac Giang University of Agriculture and Forestry had a significant impact on students' vocabulary acquisition, particularly in terms of students remembering language and enjoying their vocabulary learning. Her thesis found out that "students are more eager to learn vocabulary thanks to the application of mind maps in vocabulary lesson.", but the thesis also pointed out the drawbacks of the mind maps techniques which are time-consuming and costly and students found "it is difficult to follow the lesson".

III. RESEARCH METHODOLOGY

The study aims to evaluate the effects of teaching English vocabulary using mind maps to 12th graders compared with the teaching of English vocabulary using conventional teaching methods and to find out the students' remarks about learning English vocabulary using mind maps. Two research questions were formulated include: 1. What are the effects of teaching English vocabulary using mind maps to 12th graders in

comparison with the teaching of English vocabulary using conventional teaching methods? And 2. What are the students' remarks about learning English vocabulary using mind maps? The data for the study was gathered from a pre- and post-test on vocabulary and a questionnaire. The participants in this study are 95 Grade 12 students at a high school in a rural area of Vietnam. The researcher divided them into two groups according to the class

where they were studying as classified by the school which are experimental and control one. The control group consisted of 47 students, 24 males and 23 females. The experimental one included 48 students, 40 of whom were females and 8 males. The students were taught English with the new course book for the ten-year curriculum. They have 45-minute periods of English weekly. The pre-test was administered to the two groups as the study gets underway. In 30 minutes, these two groups completed the 20-question pretest. The writer then compares and contrasts the findings from the two. The two groups were then taught the identical vocabulary and revisited five lessons into each unit later, but they received two distinct treatments: the experimental group was given mind mapping techniques, while the control group was taught using other methods, such as visuals and translation. The post-test was given to the learners in both treatment groups afterward in order to assess and verify their retention of the language items. The writer then distributed the questionnaire to the experimental group to assess the students' perceptions of vocabulary learning with mind maps.

Quantitative analysis for the pre-test and the post-test is designed for the experimental and control groups. The score frequency, mean and standard deviation for the two tests of each group are calculated with the Statistic Package for the Social Sciences (SPSS) of version 26 for Windows to help readers become familiar with the average value, the dispersion of the test scores around the mean value. In analysing the data from questionnaires and interpret the findings, the researcher established a threshold of 3.00. If the mean value for an item fell below this threshold (less than 3.00), it indicated that, on average, the participants disagreed or expressed a lower level of agreement with the statement. Conversely, if the mean value exceeded 3.00, it suggested that, on average, the participants agreed or expressed a higher level of agreement with the statement. Data from the interviews were analysed qualitatively.

IV. FINDINGS AND DISCUSSION

1. Results of the Tests

Figure 4.1: Pre-test score distribution of control and experimental group
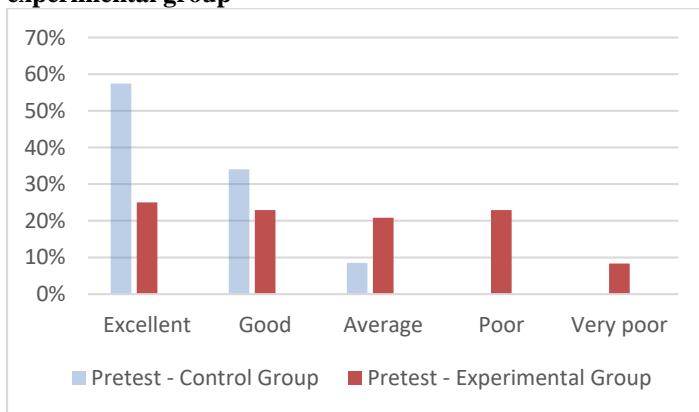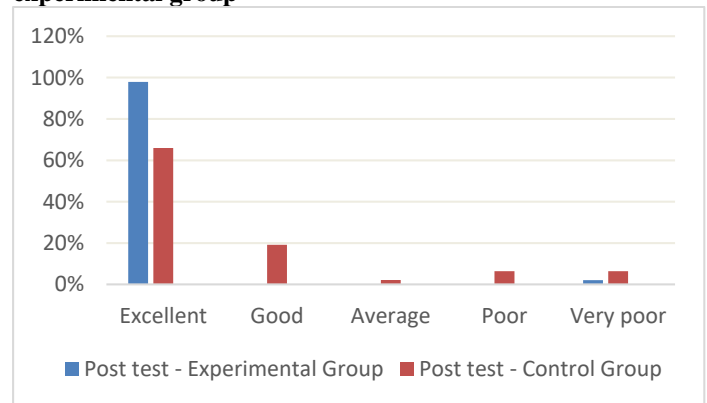

The control group had a higher percentage of students who scored "excellent" (57%) compared to the experimental group (25%). This suggests that the control group had more students who were already proficient in English.

The experimental group had a higher percentage of students who scored "average" (21%) and "poor" (23%) compared to the control group (9% and 0%, respectively). This suggests that the experimental group had more students who were struggling with English prior to the intervention.

The percentage of students who scored "good" was similar between the two groups (34% for control and 23% for experimental). The experimental group had a higher percentage of students who scored "very poor" (8%) compared to the control group (0%). This suggests that there were some students in the experimental group who were struggling significantly with English prior to the intervention.

Following the intervention, the post-test was administered to both groups by the researcher. The distribution of the scores earned by each group is presented in Figure 4.2.

Figure 4.2: Post-test score distribution of control and experimental group

In the Experimental group, 98% of the students scored in the Excellent range (8-10), which is a significantly higher percentage than the Control group, where only 66% of the students scored in the same range. On the other hand, none of the students in the Experimental group scored in the Good, Average, or Poor ranges. However, 2% of the students in the Experimental group scored in the Very Poor range.

In the Control group, besides the 66% of students who scored in the Excellent range, 19% of students scored in the Good range (6.5-7.9). Additionally, 2% and 6% of the students scored in the Average (5-6.4) and Very Poor (0-3.4) ranges, respectively.

Overall, these results suggest that the Experimental group outperformed the Control group in the post-test, with a significantly higher percentage of students scoring in the Excellent range, and none scoring in the lower ranges.

In Table 4.1 below, the descriptive data of the pre-test for each group is presented, including the minimum and maximum score, mean, and standard deviation.

Table 4.1: Comparison of Pretest Results

Group	Control	Experimental
N	48	47
Mean	7.67	6.08
Std. Deviation	0.76	2.20
Minimum	5	0
Maximum	9	10

The results indicated that the mean score of the experimental group on the pretest was lower (mean = 6.08) than the mean score of the control group (mean = 7.67). This difference may be attributed to the initial difference in the levels of English language proficiency between the two groups. Additionally, the standard deviation of the experimental group (2.20) was larger than the standard deviation of the control group (0.76), indicating that the scores in the experimental group were more spread out.

Table 4.2: Independent samples t-test of the two groups after the pre-test

	F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference
Equal variances assumed	4.692	0.033	4.689	93	< 0.001	1.591	0.339	(0.91)
Equal variances not assumed	4.72	0.033	4.689	86.1	< 0.001	1.591	0.337	(0.91)

The significance level (Sig.) for the test of equal variances is reported for both cases, and the significance value is the same (0.033) in both scenarios. So we should read the outcomes in the column "Equal variances assumed".

The Sig. value (2-tailed) refers to the significance level (or p-value) associated with the t-test for the comparison of means between the two groups. In this context, it represents the probability of observing a difference as extreme as the one found in the sample data, assuming that there is no true difference in the population. A significance level of <0.001 (which is less than 0.05, the typical threshold for statistical significance) indicates that the observed difference in mean scores between the groups is highly unlikely to be due to random chance alone.

Therefore, the Sig. value (2-tailed) being less than 0.05 suggests a statistically significant difference between the means of the two groups. Based on these findings, we can conclude that the experimental group has demonstrated significantly better performance compared to the control group.

Table 4.3: Analysis of the post-test mean scores comparison.

Group	Control	Experimental
N	48	47
Mean	7.38	8.82
Std. Deviation	2.09	1.39
Minimum	0	0
Maximum	9.25	10

According to the post-test overview in Table 4.3, the experimental group showed a higher mean score of 8.82 compared to the control

group's mean score of 7.38. The experimental group also had a smaller standard deviation of 1.39, indicating less variability in their scores compared to the control group's standard deviation of 2.09.

In terms of the score range, the control group had a minimum score of 0 and a maximum score of 9.25, while the experimental group had a minimum score of 0 and a maximum score of 10. Overall, the experimental group performed better than the control group, as shown by the higher mean score and smaller standard deviation. It is worth noting that the difference in mean scores between the two

	F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference
Equal variances assumed			-3.99	93	< 0.01	-1.43	0.35	(-2.15,)
Equal variances not assumed	4.70	0.03	-3.9	86.1	< 0.01	-1.43	0.35	(-2.15)

groups was relatively large, indicating a significant difference in their post-test performance.

Table 4.4: Independent samples t-test of the two groups before the treatment

The outcomes should be interpreted in the column "Equal variances not assumed." This is because the significance level (Sig.) for the test of equal variances is reported for both cases, and the significance value is 0.033 in the "Equal variances not assumed" scenario.

The t-value reported in both cases is -3.99, with a degree of freedom (df) of 93 when equal variances are assumed and 86.1 when they are not. The significance level (Sig. 2-tailed) is <0.001 in both cases, indicating a statistically significant difference between the means of the two groups.

After having finished the post-test, the experimental group received 40 copies of the questionnaire. To understand the study more clearly, each question in the questionnaire was cautiously analyzed to clarify students' opinions after learning vocabulary with mind maps.

2. Results of the Questionnaire

The first part of the questionnaire aimed to gather information about the advantages of learning vocabulary with mind maps. Data analysis for items 1-7 about the advantages that students thought learning vocabulary with mind maps brought about is presented in Table 4.5 below.

Overall, the results showed that the majority of the students (over 70%) agreed or strongly agreed that using mind maps helped them learn English vocabulary more effectively. The means for all items

were under 3.0, indicating that the students generally agreed with the benefits of using mind mapping.

Specifically, the most prominent advantage of using mind maps, according to the students, was that it was clear and understandable, which helped them learn vocabulary easily (Item 1 with M = 1.708, SD = 0.683). A large percentage of the students (78%) strongly agreed that they were able to learn English vocabulary more quickly using mind maps (Item 2 with M = 1.229, SD = 0.515).

Furthermore, the students found mind mapping to be very simple and suitable for their needs, with 38% of them agreeing and 26% strongly agreeing with this statement (Item 3 with M = 2.063, SD = 0.783). In addition, mind mapping was seen as a way to widen their vocabulary, with 60% of the students agreeing or strongly agreeing with this statement (Item 5 with M = 2.146, SD = 0.967). The students also found that mind mapping helped them remember vocabulary longer, with 64% of the students agreeing with this statement (Item 6 with M = 1.833, SD = 0.559). Lastly, mind mapping was seen as a way to make studying vocabulary more interesting, with 62% of the students agreeing or strongly agreeing with this statement (Item 7 with M = 2.021, SD = 0.887).

While there were some students who did not agree with the benefits of mind mapping for learning English vocabulary (ranging from 2% to 8%), the majority of the students had positive experiences with this method. These results suggest that using mind maps can be an effective tool for improving English vocabulary acquisition among students, as it can help make the learning process more engaging, clear, and memorable.

Table 4.5: Advantages brought about by learning vocabulary with mind maps

	SA	A	N	D	SD	M	S.D
	1	2	3	4	5	3.00	1.58
1. I think mind mapping is clear and understandable.	**20**	**22**	**6**	**0**	**0**	1.70	0.68
	42%	*46%*	*13%*	*0%*	*0%*		
2. I am able to learn English vocabulary more quickly using mind maps.	**39**	**7**	**2**	**0**	**0**	1.22	0.51
	78%	*14%*	*4%*	*0%*	*0%*		
3. Using mind mapping is very simple and suitable for me	**13**	**19**	**16**	**0**	**0**	2.06	0.78
	26%	*38%*	*32%*	*0%*	*0%*		
5. Mind mapping helps me widen my vocabulary	**15**	**15**	**14**	**4**	**0**	2.14	0.96
	30%	*30%*	*28%*	*8%*	*0%*		
6. Mind mapping helps me remember vocabulary longer.	**12**	**32**	**4**	**0**	**0**	1.83	0.55
	24%	*64%*	*8%*	*0%*	*0%*		
7. Mind mapping makes me more interested in studying vocabulary.	**17**	**14**	**16**	**1**	**0**	2.02	0.88
	34%	*28%*	*32%*	*2%*	*0%*		

The second part of the questionnaire aimed to gather information about the disadvantages of learning vocabulary with mind maps.

The means for items 8-11 are all above 3.0, indicating that there are some disadvantages associated with learning vocabulary with mind maps. According to the results, one of the disadvantages of using mind maps to study vocabulary is that it can waste students' time (M = 3.979, SD = 0.668). Over half of the students (56%) disagreed with this statement, and 21% strongly disagreed, but there were still a significant number of students (23%) who were neutral that using mind maps to learn vocabulary was a waste of time.

The other significant disadvantage was that some students found mind mapping too complex to use as a routine (M = 3.313, SD = .552). A large proportion of the students (70%) were neutral that mind mapping was too complex to use regularly, while only 4% of students strongly disagreed with this statement.

For Item 10 (M = 3.979, SD = 0.668), *"I have difficulty in remembering some words with mind maps,"* the majority of participants (76%) responded with a rating of 3 (neutral) or higher, indicating that they experienced some difficulty in remembering vocabulary words with mind maps. This result suggests that participants may need to develop more effective strategies for using mind maps to aid vocabulary retention.

Finally, for Item 11, *"I sometimes have difficulty in making a true mind map,"* almost half of the participants (46%) responded with a rating of 2 (agree) or higher, indicating that they found it challenging to create effective mind maps for vocabulary learning. This finding highlights the importance of providing participants with clear guidance on how to construct effective mind maps and how to use them to facilitate vocabulary learning.

Overall, these results suggest that while mind mapping can be an effective method for learning vocabulary, it may not be suitable for all students. Some students may find it too complex or have difficulty remembering words with this method, which may ultimately affect their overall performance in learning English vocabulary.

Table 4.6: Disadvantages resulting from learning vocabulary with mind maps

	SA	A	N	D	SD	M	S.D
	1	2	3	4	5		
8. Mind maps is wasted my time to study vocabulary	**0**	**0**	**11**	**27**	**10**	3.97	0.66
	0%	*0%*	*23%*	*56%*	*21%*		
9. Mind mapping is too complex to use as a routine	**0**	**0**	**35**	**11**	**2**	3.31	0.55
	0%	*0%*	*70%*	*22%*	*4%*		
10. I have difficulty in remembering some words with mind maps.	**0**	**5**	**38**	**2**	**3**	3.06	0.63
	0%	*10%*	*76%*	*4%*	*6%*		
11. I sometimes have difficulty in making a true mind map.	**0**	**23**	**21**	**2**	**2**	2.64	0.75
	0%	*46%*	*42%*	*4%*	*4%*		

Table 4.7 below displays the students' future intentions regarding learning vocabulary with mind maps, as measured by items 12 and 13. The mean score for item 12 was 1.854 (SD = 0.505), which

indicates that a large majority of the students that teachers should continue teaching vocabulary with mind maps in the future. Specifically, 73% of the students agreed and 21% strongly agreed with this statement, while only 6% were neutral and none disagreed or strongly disagreed. This result suggests that the students find mind mapping as a useful tool for learning vocabulary, and they would like to see it incorporated into their future learning experiences.

Regarding item 13, the mean score was 2.354 (SD = 0.526), indicating that a majority of the students (60%) agreed or strongly agreed that they intend to learn English vocabulary by themselves with the help of mind mapping in the future. Specifically, 58% of the students agreed and 36% were neutral with this statement, while only 2% strongly agreed and none disagreed or strongly disagreed. This result indicates that the students see themselves using mind maps to learn vocabulary outside of the classroom, and they feel confident in their ability to do so.

Table 4.7: Students' future intentions of learning vocabulary with mind maps

	SA	A	N	D	SD	M	S.D
	1	2	3	4	5	3.00	1.58
12. I think teachers should keep teaching vocabulary with mind maps in the future.	10	35	3	0	0	1.85	0.50
	21%	73%	6%	0%	0%		
13. I intend to learn English vocabulary by myself with help of mind mapping.	1	29	18	0	0	2.35	0.52
	2%	58%	36%	0%	0%		

3. Discussion

The findings suggest that the intervention had a positive impact on the experimental group's performance in English. The post-test results show that the intervention was effective in improving the students' grades, particularly for those who were struggling with English prior to the intervention. In contrast, the control group's grades decreased significantly, with a tripling of students receiving poor grades.

The pre-test data also sheds light on the differences between the two groups before the intervention. The control group had a higher percentage of students who were already proficient in English, while the experimental group had more students who were struggling with the language. This highlights the importance of considering the students' proficiency levels before implementing any intervention, as it can impact the results.

It is also worth noting that the experimental group had a higher percentage of students who scored "very poor" in the pre-test, indicating that they were facing significant challenges in learning English. The fact that this score range was not observed in the post-test results suggests that the intervention was successful in addressing these challenges.

Overall, this study provides evidence that targeted interventions can have a positive impact on students' performance in a specific subject. The data can be useful for educators and policymakers in designing effective interventions to improve student outcomes. However, it is important to consider individual student needs and proficiency levels when implementing interventions, and to monitor and evaluate their effectiveness.

Based on the data provided, the majority of the students agreed or strongly agreed that using mind maps helped them learn English vocabulary more effectively. The most prominent advantage of using mind maps, according to the students, was that it was clear and understandable, which helped them learn vocabulary easily. Additionally, the students found mind mapping to be very simple and suitable for their needs. Mind mapping was also seen as a way to widen their vocabulary and make studying vocabulary more interesting. Moreover, mind mapping helped them remember vocabulary longer.

However, there were some disadvantages associated with learning vocabulary with mind maps. According to the results, one of the disadvantages of using mind maps to study vocabulary is that it can waste students' time. Some students found mind mapping too complex to use as a routine. The majority of participants experienced some difficulty in remembering vocabulary words with mind maps. Many students found it challenging to create effective mind maps for vocabulary learning.

Overall, these results suggest that while mind mapping can be an effective method for learning vocabulary, it may not be suitable for all students. Some students may find it too complex or have difficulty remembering words with this method, which may ultimately affect their overall performance in learning English vocabulary.

Regarding students' future intentions of learning vocabulary with mind maps, the data showed that the majority of students plan to continue using mind maps to learn English vocabulary in the future. This indicates that students found mind mapping to be a valuable tool for learning English vocabulary, and they plan to continue using it in their future studies.

V. CONCLUSION

The results of the research suggest that using mind maps as a tool for teaching English vocabulary to 12th graders can have a positive impact on students' learning outcomes compared to conventional teaching methods. The post-test results showed that the intervention was effective in improving the students' grades, particularly for those who were struggling with English prior to the intervention. In contrast, the control group's grades decreased significantly. The study highlights the importance of considering the students' proficiency levels before implementing any intervention, as it can impact the results.

Regarding students' remarks about learning English vocabulary using mind maps, the data suggests that the majority of students found mind mapping to be a useful and effective method for learning vocabulary. The most prominent advantage of using mind maps was that it was clear and understandable, which helped them learn vocabulary easily. Mind mapping was also seen as a way to widen their vocabulary and make studying vocabulary more interesting. However, there were some disadvantages associated with learning vocabulary with mind maps, such as the potential waste of time, and difficulty in remembering vocabulary words with mind maps. Despite this, the majority of students had positive experiences with this method and plan to continue using it in their future studies.

Based on the findings of the study, several recommendations can be made for teachers and students in teaching and learning English vocabulary using mind maps.
For Teachers

Teachers can apply the following steps to effectively teach English vocabulary using mind maps:

Step 1: Start by writing the key word in the center of the board and ask students to think of related words.

Step 2: Allow students to freely suggest words, which are then written on the board by the teacher.

Step 3: Instruct students to chorally group the words that have relationships in the same category.

Step 4: Create a hierarchy of trunk, branches, and twigs by arranging the map word by word with different colors, symbols, or shapes.

For the second and third mind maps, teachers can ask students to work in groups instead of chorally as in step 3.

Teachers can also use media to attract students' attention. Customized animations can be used to make the lesson more engaging as they utilize varied colors and vivid visuals.

Finally, teachers can provide a printed mind map to help students correctly write up the lesson.

For Students

To effectively learn English vocabulary using mind maps, students should:

- Pay attention to the lesson and actively engage in the creation of a mind map.
- Be given time to read books or search the internet to expand their knowledge of vocabulary, such as parts of speech or contextual usage.
- Practice English both orally and in writing.
- Develop a passion for studying English and a strong intrinsic motivation to continue it.

In conclusion, incorporating mind maps into the teaching and learning of English vocabulary can be an effective method. Teachers can apply the basic steps of mind mapping while using media to make the lesson more engaging, while students can actively engage in the creation of mind maps and expand their knowledge of vocabulary.

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AUTHORS

First Author – Hai, Dao Thi Vu, B.A, Chu Van An High School, Thai Binh province, Viet Nam.
hai.green.mango81@gmail.com.