USING MIND MAPS TO IMPROVE ENGLISH VOCABULARY FOR 10TH-GRADE STUDENTS AT LUONG DAC BANG HIGH SCHOOL

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Abstract: *While vocabulary acquisition is a challenge for many language learners, mind mapping technique is believed to offer an effective way for them to improve vocabulary learning ability. This experimental study involved 90 students from classes 10A11 and 10A12 at Luong Dac Bang High School to assess the impact of mind map on vocabulary retention. The results from survey questionnaires, interview, pre-test, post-test and regular tests over 8 weeks indicate that students in the experimental group showed significant improvement in vocabulary knowledge compared to the control group. This affirms the role of mind maps in enhancing students' vocabulary.*

Keywords: *Mind maps, mind mapping technique, English vocabulary learning, high school education*.

1. Introduction

Vocabulary is a fundamental aspect of language acquisition, providing the foundation for developing listening, speaking, reading, and writing skills [7]. However, many students face challenges in retaining vocabulary due to reliance on rote learning methods that prioritize memorization over meaningful connections [14]. In high school settings, vocabulary instruction often focuses on isolated word lists, hindering students' ability to recall and apply vocabulary effectively [10]. This approach results in a superficial understanding, limiting students' ability to use words flexibly and confidently [7].

Mind mapping, introduced by Buzan (2006), offers a student-centred approach that organizes vocabulary by visually connecting related words. This method helps students form meaningful connections, improving memory retention and deepening understanding [3]. Mind mapping also encourages active learning, which promotes learner autonomy and motivation, leading to long-term retention [13]. Furthermore, it accommodates various learning styles, benefiting both visual and kinaesthetic learners [12].

In Vietnam, there has been a variety of researches representing that using mind maps can enhance vocabulary acquisition, engagement, and motivation among university students [2], [8]. However, limited researches exist on its impact on high school learners, who are at the golden age for acquiring vocabulary knowledge. This study aims to

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address this gap by evaluating the effectiveness of using mind maps in improving vocabulary acquisition among 10th-grade students at Luong Dac Bang High School. Findings are expected to provide insights into effective strategies for enhancing vocabulary learning in secondary education.

2. Literature Review

2.1. Overview about vocabulary and vocabulary learning

Vocabulary refers to the set of words known and used by an individual or a group [4] and is essential for effective communication. Many educators classified vocabulary in different ways. Aebersold and Field (1997) categorized vocabulary into active (used in communication) and passive (recognized in context) [1]. Crystal (1995) distinguished between notional words (with clear meaning) and functional words (with grammatical roles) [4]. Nation (2013) put vocabulary into receptive (understood in reading or listening) and productive (used in speaking and writing) categories. He also separated words into high-frequency (commonly used) and low-frequency (rarely used) categories [7].

Vocabulary learning means acquiring and using words correctly, which involves understanding a word's meaning, spelling, pronunciation, form, and usage. Therefore, it is commonly accepted that to really know a word means to understand all linguistic contents of the word including orthography, phonology, morpho-syntax, morphology, syntax, and semantics (Peters, 2014, p. 164-165) [11]. To learn vocabulary effectively, educators, teachers and students have suggested various techniques including visual methods, verbal techniques, and translation methods. The most straightforward and applicable technique is translation or changing a term into the learner's original language since it is a direct link between the target word and its equivalent in the first language. Regarding the visual methods, Gairns and Redman (1980) as cited by Marla et al. (1990, p. 12) [6], stated that there are three types of visual techniques: using realia (objects and material from everyday life), pictures (real-world visuals of new words that can be used in class), and the use of mime or gestures (movement and facial expressions). Differently, verbal technique applies to the use of illustrative situations, synonyms, antonyms, scales, definitions, and categories when teachers introduce a new term to students. These methods enhance understanding and retention, making vocabulary learning more engaging and practical.

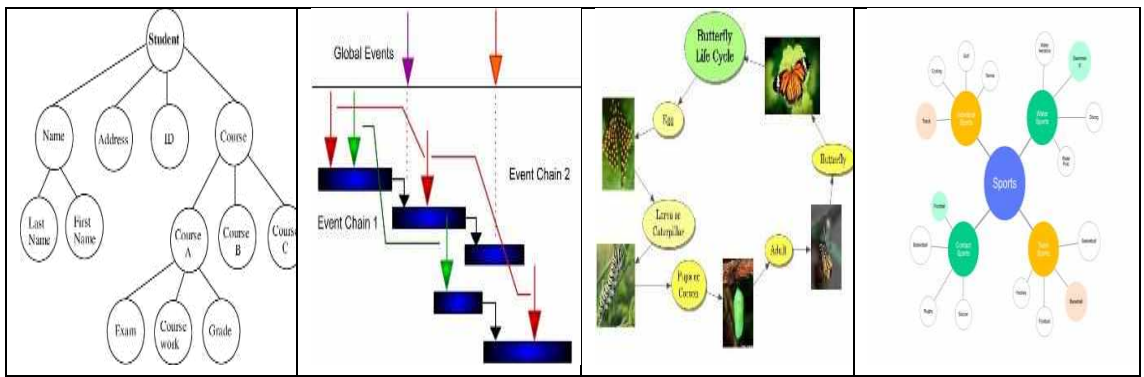
The assessment of vocabulary learning ability plays a crucial role in determining the effectiveness of vocabulary teaching and learning methods, particularly in the context of learning English as a foreign language. In the field of language teaching and assessment, researchers have long emphasized the importance of diverse and interactive vocabulary testing methods to enhance learners' retention and application of vocabulary knowledge. Many studies have demonstrated that when vocabulary is taught and tested through a variety of task types, learners tend to engage more deeply and remember words more effectively [7]. Therefore, based on the linguistic aspects of vocabulary mentioned above, some of the most common vocabulary learning exercises designed are: unscramble letters, finding missing letters, matching words with their definitions, labelling pictures, choosing synonyms or antonyms, filling in the blanks to complete the

sentences, listening and choosing the correct word, finding word formation, finding the word with different sound or stress…

2.2. Mind maps and application of mind maps in learning vocabulary

Mind maps are visual learning tools introduced by Tony Buzan in the 1970s. They help learners organize ideas by placing a central concept in the middle of a page and linking it to related ideas using branches. This technique makes information easier to understand and remember by combining keywords, images, colors, and connections.

Mind maps can be created either by hand or using digital tools in different forms to serve different purposes in organizing information, depending on the nature of the content and learning goals. Trianto (2009, as cited in Effendi, 2004, p. 10-11) distinguished them into four kinds, namely: network tree, event chain, cycle concept map, and spider concept map. A network tree is effective for illustrating various relationships such as cause-and-effect connections, hierarchical structures, branching procedures, and technical terms that can be used to explain complex correlations. An event chain is useful for illustrating the sequence of events such as in accident orders, procedural steps, or process stages. A cycle concept map is designed to illustrate situations where the combination of events or accidents does not lead to a final result, but rather continues in a repeating loop. A spider concept map is used to represent ideas that radiate from a central point, expanding into various larger concepts. Among these four types, spider concept maps are the most common and effective kinds applied in learning second language vocabulary [5].



An example of network tree	An example of event chain	An example of cycle concept map	An example of spider concept map

Figure 2.1. Types of mind maps (Trianto, 2009 as cited in Effendi, 2004, p. 10-11)

Mind maps are especially useful in educational settings because they simplify complex information and can be learning tools for students to inquire vocabulary with all three techniques of visual methods, verbal techniques, and translation methods. They encourage creative thinking, help learners actively engage with the material, enhance memory, boost motivation, and improve communicative skills [3]. In Vietnamese contexts, the impact of using mind maps on learning English vocabulary has been affirmed in some investigations by Bui Thi Ngoc Anh (2022), Nguyen Thi Kim Hoa

(2023) and Nguyen Phu Cuong (2024). The results in the studies demonstrate that the students who used mind maps performed better in vocabulary tests and retained words more effectively. Additionally, they reported higher motivation and interest in learning through mind maps [2], [8],]9].

3. Methodology

3.1. Context and participants

Participants in the study include 90 grade-10 students from two classes at Luong Dac Bang High School, Thanh Hoa Province, divided into control group (10A12 with n=45) and experimental group (10A11 with n=45). The control group followed traditional instruction while the experimental group used mind maps for learning vocabulary.

3.2. Data collection instruments

This study used three main data collection instruments: questionnaires, interviews, and test scores (pre-test, post-test and regular tests).

The questionnaire given to the experimental group to survey students' subjective assessment about their improvement in vocabulary retention after finishing the learning process. It included 9 statements on a 5-point Likert scale from "strongly disagree" to "strongly agree" to reflect students' opinions on their enhancement in vocabulary range, accuracy and application in communication.

After the survey, interviews were conducted with 5 students in this group to explore more deeply about their experience and assessment using mind maps.

To evaluate students' vocabulary enhancement objectively, pre-test, regular tests, and post-test are set. Each test involved a variety of vocabulary exercise types based on all linguistic contents of words such as unscramble letters, finding missing letters, matching words with their definitions, labeling pictures, choosing synonyms and antonyms, filling in the blanks to complete the sentences, listening and choosing the correct word, finding word forms, finding the word with different stress and finding the word with a different sound. The pre-test and the post-test consist of 40 questions to be completed in 45 minutes. The words in the pre-test are selected from Unit 1 to Unit 6. Approximately 50% of the vocabulary in the post-test is taken from the pre-test but designed in a different tasks; the remaining 50% consists of new words selected from lessons between weeks 2 and 7. For the regular tests, each has 20 questions being conducted for 20 minutes every week. The vocabulary in the regular test is taken from the set of questions for each week.

3.3. Data Collection Procedure

The study was conducted for 8 weeks. Every week, students have to study 10 words in different lessons in unit 7, 8 and 9 from English textbook 10 Global Success.

Week 1: The teacher let all students in two groups do the pre-test. The students of the experimental group were then taught how to create and use mind maps to learn vocabulary.

Weeks 2-7: While students from the control group still learnt in the traditional way, students from the experimental group learned vocabulary through the use of mind maps. During the first two weeks, the teacher designed mind maps and gave students handouts to learn vocabulary. In the following two weeks, the teacher displayed mind maps on the TV screen while students actively took notes in their notebooks. In the final two weeks, students were given only the target words and required to create their own mind maps independently. The teacher provided detailed instructions on what must be included in each mind map covering all linguistic contents of lexicons: the spelling of the word (orthography), phonetic transcription (phonology), other parts of speech (morphology), other word forms in sentences such as singular and plural forms or adjective comparison… (morpho-syntax), its meaning, synonyms as well as antonyms (semantics), an illustrative image and an example sentence using the word (syntax).

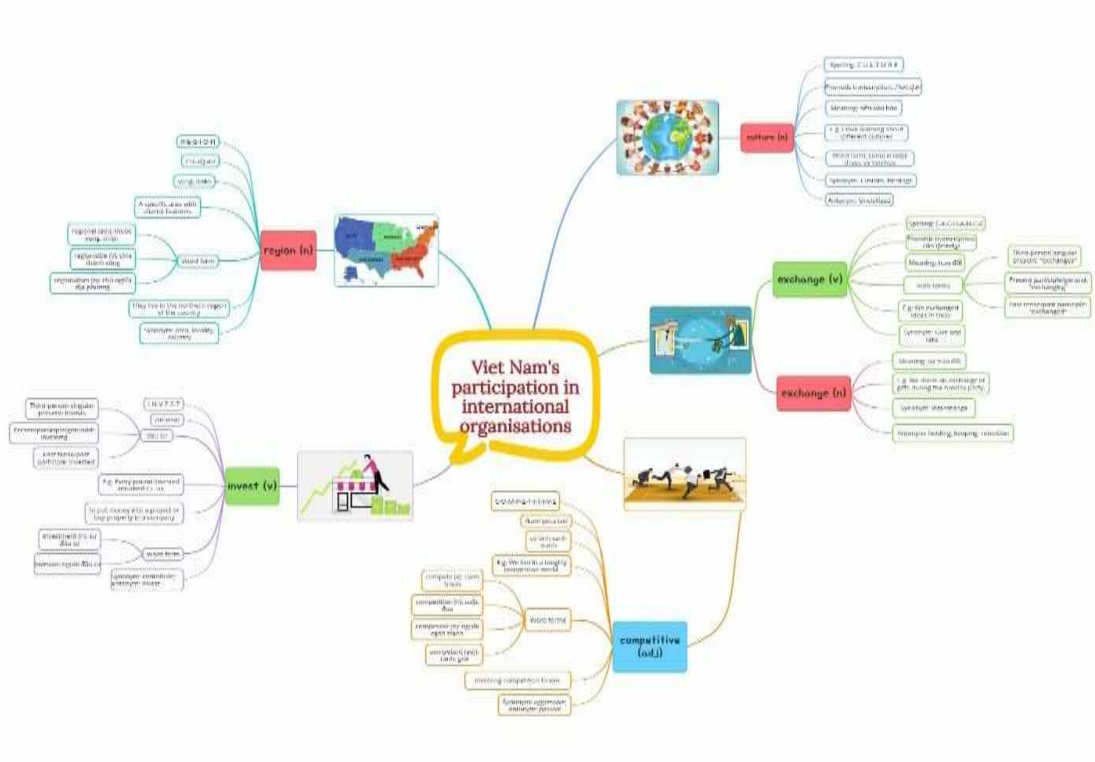


Figure 3.2. A sample mind map used in week 3

At the end of each week, a series of vocabulary regular tests was also carefully constructed and administered with a wide variety of exercises to cover linguistic aspects of lexicons.

Week 8: A post-test matching the pre-test format followed by a survey and interviews with 5 experimental-group students was conducted to capture feedback and in-depth perceptions of mind mapping-supported practice.

3.4. Data analysis methods

Data was analyzed using both quantitative and qualitative methods. Quantitative analysis involved questionnaire responses and the comparison of pre-test, regular test, and post-test scores using descriptive statistics in Microsoft Excel to track vocabulary improvements. Qualitative data from interviews were analyzed for themes related to vocabulary development, student perception, and experience with mind maps, providing deeper insights into the effectiveness of the intervention.

4. Findings and Discussion

4.1. The effectiveness of using mind maps in learning English vocabulary through students' subjective assessment

The responses from the survey and interviews demonstrate that the students highly valued the impact of using mind maps in fostering greater vocabulary range, ability to use vocabulary accurately in context and ability to use vocabulary flexibly in communication.

According to table 4.1, approximately 90% of students agree or strongly agreed that their vocabulary retention, use of synonyms, and recognition of word forms improved after learning words through mind mapping technique. Likewise, 80% of the survey respondents affirmed that their accuracy in using vocabulary significantly improved - not only in spelling words correctly and using them more appropriately in sentences, but also in distinguishing between commonly confused words like "remember" and "remind". The number of students who gave positive feedback about their improved ability to use vocabulary more flexibly in communication was similarly high. About 85% of students agreed they could use vocabulary more flexibly and accurately in all four language skills after the experiment with speaking skills witnessing the highest improvement. This suggests application of mind maps effectively enhanced students' vocabulary.

Table 4.1. *Students' self-assessment of their English vocabulary after the experiment*

No	Content of question	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
	A. Increase in vocabulary range					
1.	I have remembered more words.	0 (0%)	1 (2.2%)	4 (8.9%)	8 (17.8%)	32 (71.1%)
2.	I am able to replace words I have learned with synonyms/ antonyms.	0 (0%)	1 (2.2%)	4 (8.9%)	9 (20%)	31 (68.9%)
3.	I have learned and remembered different word forms (nouns, verbs, adjectives, adverbs) related to the words I have learned.	0 (0%)	2 (4.4%)	4 (8.9%)	8 (17.8%)	31 (68.9%)

	B. Ability to use vocabulary accurately in context					
4.	I make fewer spelling mistakes.	1 (2.2%)	2 (4.4%)	5 (11.1%)	9 (20%)	28 (62.3%)
5.	I can differentiate between easily confused words (such as "remember" and "remind").	0 (0%)	3 (6.7%)	4 (8.9%)	11 (24.4%)	27 (60%)
6.	I can understand and use words correctly in a complete sentence.	1 (2.2%)	2 (4.4%)	5 (11.1%)	10 (22.3%)	27 (60%)
	C. Ability to use vocabulary flexibly in communication					
7.	I can flexibly use the words I have learned to understand reading and listening materials more accurately and clearly.	2 (4.4%)	1 (2.2%)	6 (13.3%)	12 (26.7%)	24 (53.4
8.	I can flexibly and accurately use the words I have learned in writing English.	1 (2.2%)	2 (4.4%)	5 (11.1%)	11 (24.5%)	26 (57.8%)
9.	I can flexibly and accurately use the words I have learned in speaking English.	1 (2.2%)	1 (2.2%)	5 (11.1%)	12 (26.7%)	26 (57.8%)

Following the survey results, interviews with students in the experimental group further illuminated how mind mapping technique supported their vocabulary development. All the students reported that using mind maps helped them remember vocabulary more effectively, understand words better and apply them more accurately and fluently in language skills.

When answering question number 1 about the influence of using mind maps on their vocabulary range, the students stated that they really know more words.

"… I feel like I remember a lot more words, especially learning more about their different word forms as well as their synonyms and antonyms…" (ST3 - Q1)

"…Before, I only knew the meaning of the word, but after learning through the mind map method guided by my teacher, I realized how much more there is to learning a word. I didn't expect a single word to have so many related forms." (ST5 – Q1)

Concerning the accuracy of vocabulary usage in context, all interviewees acknowledged that they made fewer spelling mistakes and were more accurate and appropriate in filling in words within sentences.

" ...Thanks to learning vocabulary with synonyms/antonyms, different word forms, examples and reviewing vocabulary in various contexts, I use vocabulary more accurately and seldom misuse words …. In addition, I also have a better understanding of the meaning and usage of words..." (ST2, Q2)

With regard to everyday language use, respondents indicated that employing mind maps for vocabulary acquisition enhanced their comprehension of reading and listening tasks, while also enabling more fluent and natural expression in both speaking and writing.

"…After using this technique for a while, I found that vocabulary came to me more naturally during communication. I no longer had to 'search for words' in my head, and I could respond more quickly—especially when writing essays or giving presentations in English..." (ST4, Q3)

"…I have learned more words as well as synonyms with similar meanings, so I feel less confused when doing reading or listening exercises where synonymous expressions are used to convey ideas or ask questions." (ST1, Q5)

The collected data clearly demonstrates that students exhibit a highly positive attitude toward the use of mind maps and regard them as an effective tool for vocabulary development.

4.2. The effectiveness of using mind maps in learning English vocabulary through objective test scores

The assessment results from regular tests, pre-test and post-test demonstrate that students utilizing mind maps achieved significantly greater vocabulary expansion compared to those employing traditional learning methods.

As can be seen from the table 4.2, the proportion of students achieving scores above 6.5 was relatively comparable between the two groups prior to the intervention, at approximately over 40%. After eight weeks of experimental implementation, a considerable divergence emerged. Although both groups experienced an increase in the number of students scoring 6.5 and higher, the improvement was substantially greater in the experimental group.

Table 4.2. Asessment results of the Pre-test and Post-test in the experimental and control groups

Score	Pre-test results		Post-test results	
	Control group	Experimental group	Control group	Experimental group
< 5	13.3%	11.1%	9.5%	4.4%
5.0 - 6.4	44.4%	47.7%	37.5%	24.4%
6.5 - 8.4	31.2%	28.9%	30.7%	33.3%
8.5 - 10	11.1%	12.3%	22.3%	37.9%

Specifically, the proportion of students achieving scores between 6.5 and 8.4 in the control group remained relatively stable at over 30%, while in the experimental group, it rose slightly from nearly 29% to over 33%. The most notable difference was observed in the higher-scoring segment. In the experimental group, the proportion of students attaining scores of 8.5 and higher tripled, increasing from 12.3% to nearly 38%, whereas in the control group, this proportion only doubled, rising from slightly above 11% to just over 22%. This indicates a substantial decrease in the number of low-scoring students, particularly in the experimental group, where the proportion of students scoring below 5 dropped from 11% to just over 4%.

Overall, the percentage of students with below-average scores in the experimental group dropped significantly, while the control group showed less noticeable change. This demonstrates that mind mapping had a positive and comprehensive impact on 10th-grade students' vocabulary acquisition.

A similar pattern was observed in the results of the regular tests. According to data shown in table 4.3, the experimental group witnessed significant improvement in vocabulary with a sharp decrease in the figure of students scoring below 5 points and a notable increase in those achieving top scores. In contrast, the control group showed minimal change.

Table 4.3. *Assessment results of regular tests in the experimental and control groups*

Score	Week 2		Week 3		Week 4		Week 5		Week 6		Week 7	
	Control group	Experimental group	Control group	Experimental group	Control group	Experimental group	Control group	Experimental group	Control group	Experimental group	Control group	Experimental group
< 5	17.8%	13.3%	15.6%	8.9%	15.6%	8.9%	13.3%	6.7%	13.3%	4.4%	13.3%	2.2%
5.0-6.4	55.6%	48.9%	55.6%	44.4%	51%	35.6%	48.9%	31%	48.9%	26.7%	51.2%	26.7%
6.5-8.4	15.6%	22.2%	17.8%	28.9%	17.8%	33.3%	20%	35.6%	20%	37.8%	22.2%	40%
8.5-10	11%	15.6%	11%	17.8%	15.6%	22.2%	17.8%	26.7%	17.8%	31.1%	13.3%	31.1%

Obviously, the percentage of students scoring above 6.5 in the control group increased steadily from approximately one-fourth to around 35%, whereas in the experimental group, this data rose sharply from about 38% to over 70% when having the intervention. Conversely, the proportion of students scoring below 6.5 in the control group also demonstrated a slight decrease, whereas in the experimental group, this figure declined sharply, particularly during the final weeks. These results highlight the positive impact of mind mapping on vocabulary retention and usage, helping students broaden their lexical resources and use them more accurately.

In summary, the use of mind maps in vocabulary learning has led to a significant improvement in students' vocabulary test scores, indicating that the application of this method has greatly supported students in enhancing their vocabulary, using English words more accurately and applying them more flexibly in both written and spoken communication.

5. Conclusion

The study indicates that the utilization of mind maps significantly improved 10th-grade students' English vocabulary at Luong Dac Bang High School. Students reported better vocabulary retention, accuracy, and flexibility in reading comprehension, speaking and writing. Test results confirmed steady improvements, with a marked increase in high scores in the experimental group. The findings affirm that mind mapping is an effective method for enhancing vocabulary acquisition and retention, suggesting its potential for wider use in secondary school language programs. This result is entirely consistent with,

and further reinforces, the findings of previous studies on the effectiveness of mind mapping in vocabulary learning as previously mentioned.

The study, though gained some noticeable results in applying mind maps to learn vocabulary to students at Luong Dac Bang High School, has some limitations of time as well as small population subjects. Therefore, the data from this study are not sufficient to represent the entire high school student population in evaluating the effectiveness of mind maps on a larger scale. Further studies with a longer duration and a larger sample size are needed to more conclusively confirm the effectiveness of mind maps in vocabulary learning for high school students in general.

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