Developing Students' Vocabulary Mastery Through Mind-Mapping Techniques for Seventh Grades at SMP Negeri 32 Semarang

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ABSTRACT

This study aims to examine the potential of mind mapping methods to enhance seventh-grade students' vocabulary mastery at SMP Negeri 32 Semarang. This research was motivated by students' difficulties in remembering new vocabulary due to monotonous and teacher-centered methods. By using mind mapping in a visual format, students were encouraged to arrange vocabulary systematically and build stronger word relationships in descriptive writing. A quasi-experimental method was used, involving class VII G as the experimental class and VII B as the control class. Data were collected using both pre- and post-tests in multiple-choice format. The results were analyzed using tests for normalcy and homogeneity, validity and reliability, and a t-test with SPSS 21. The findings show that the experimental class improved from a mean score of 69.67 to 81.67, while the control class improved from 63.00 to 79.67. The t-test result Sig. 0.000 < 0.05 confirmed a significant difference between both of the groups. The results imply that applying mind mapping yields better outcomes than traditional strategies in developing students' vocabulary skills.

Keywords: *Mind mapping, Vocabulary Mastery, Descriptive Text, English Learning, Junior High School Students*

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INTRODUCTION

Learning Vocabulary is essential for learning a second language, particularly English, which is widely recognized as a vital communication tool. Without an adequate vocabulary, students may struggle to understand spoken or written texts, express their ideas, or engage in meaningful communication. For junior high school students, particularly those in the seventh grade, vocabulary development is a critical component of language acquisition. However, traditional methods such as rote memorization, translation drills, and passive learning frequently fail to stimulate interest or promote long-term retention. This reality was observed during a teaching internship at SMP Negeri 32 Semarang, where many students demonstrated limited vocabulary knowledge and difficulty composing sentences due to their dependence on conventional instruction.

Innovative approaches are required to address these challenges and enhance students' vocabulary learning. One such method involves implementing mind mapping techniques, an inventive visual approach introduced by Tony Buzan that promotes the connection of related concepts through flexible and creative thinking. Mind maps engage both hemispheres of the brain, promoting better memory, deeper understanding, and higher motivation. Unlike traditional lists or flashcards, mind mapping allows students to organize vocabulary thematically, making associations between words more meaningful and easier to recall. This approach has been proven to enhance creativity, early brain activation, and learner-centered instruction (Syafitri et al., 2023). This method can be particularly effective when applied to descriptive texts, such as those focused on describing animals, where visualizing and categorizing word groups (e.g., physical characteristics, behaviors, habitats) is highly beneficial.

Previous research supports the integration of mind mapping into language instruction. Aziz & Yamat, (2016) found that mind mapping significantly increased students' vocabulary list performance. Similarly, A Tahrin, D Wowor, (2018) demonstrated its effectiveness in vocabulary mastery at the junior high school level. Studies by Al Shdaifat et al., (2019), Megawati et al., (2021), and Anjari et al., (2024) also affirm the positive impact of mind mapping on vocabulary acquisition and writing skills. However, most prior studies were conducted in different contexts such as digital mind mapping, various grade levels, or writing focused outcomes and often lacked integration with specific classroom-based themes like descriptive texts on animals. This study offers innovation by focussing on hand-drawn mind mapping methodologies employed in SMP Negeri 32 Semarang that are contextualised inside thematic descriptive writings about animals. Furthermore, mind maps help students visualize relationships between vocabulary categories and build cognitive links for stronger memory retention (Davies, 2011).

The theoretical foundation of this study emphasises the significance of coordinating instructional practices, learning experiences, and evaluation strategies. This connection helps students not only remember words but also use them in real-life situations. This method is shown in mind mapping, which uses pictures to get students to connect and sort words into groups based on topics. Higher-order thinking is encouraged, and it helps with short- and long-term vocabulary retention both of which are critical for language learning. According to Edwards & Cooper, (2010), mind mapping functions not only as a note-taking strategy but also as a cognitive tool that enhances comprehension through structured visuals and associative learning.

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During teaching practice at SMP Negeri 32 Semarang, it was also seen that many students had trouble building their vocabulary, mostly because they were learning in ways that were repeated and not very interesting. This problem became more clear when students wrote descriptive text, where they had to list and organize the features of things like animals in order to explain them. Mind mapping was introduced as an alternative that promotes student engagement and offers a more dynamic learning experience in order to address these challenges. This method helps students physically connect, organize, and use vocabulary. This makes learning more meaningful and improves their long-term language skills.

This research is rooted in the theoretical perspective of Micheline Chalhoub-Deville, Carol A. Chapelle, (2016), which emphasizes the importance of aligning instructional methods, learning processes, and assessment strategies. The primary aim of this study is to examine the influence of mind mapping techniques on students' vocabulary development. Specifically, it sets out to: (1) evaluate students' vocabulary mastery in English when taught using mind mapping; (2) measure students' vocabulary mastery in English who receive conventional instruction; and (3) identify whether there is a meaningful statistical difference between the two instructional approaches. Through these objectives, the study aims to enrich discussions surrounding vocabulary teaching in English as a Foreign Language (EFL) contexts, while offering practical guidance for educators seeking to implement more dynamic and student-centered learning techniques.

The conventional method vocabulary teaching, like direct translation, may help with short-term memory, but it doesn't always help with understanding or remembering later on. However, mind mapping helps students organize and remember words by using visual links and thematic relationships. Based on theoretical views and previous research, this study suggests that mind mapping will help students learn vocabulary much more effectively than traditional methods. As a result, the study focuses on determining the effectiveness of these two instructional methods in developing students' vocabulary performance. In this regard, innovative strategies are essential, as traditional teacher-centered instruction often fails to meet the needs of diverse learners (Sangid & Muhib, 2019).

RESEARCH METHODS

This study employed a quantitative methodology supported by a quasi-experimental framework, to investigate the impact of mind mapping techniques on vocabulary mastery among seventh-grade learners. The design featured two naturally formed groups: one group was exposed to vocabulary instruction through mind mapping. At the same time, the other relied on conventional teaching strategies such as word translation and rote memorization. As noted by Sugiyono (2013), quantitative research operates under a positivist paradigm, focusing on measurable data collected through structured instruments and analyzed statistically to evaluate hypotheses. In this research, mind mapping techniques served as the independent variable, while vocabulary proficiency served as the dependent variable. The chosen experimental structure, specifically the non-equivalent control group design, enabled both groups to undertake pre-test and post-test evaluations to determine the extent of vocabulary improvement following the respective interventions.

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The participants in this study were 60 students selected from 286 seventh graders at SMP Negeri 32 Semarang. These students were drawn from two classes: VII G experimental group and VII B control group, each consisting of 30 students. The sampling technique used was purposive sampling, which Caron & Markusen (2016) describe as "a non-probability technique that selects participants based on characteristics that align with the purpose of the study." Both groups were considered academically equivalent based on teacher recommendations and prior test scores, which helped minimize external biases and ensured the study's internal validity.

The primary instrument used for data collection was a multiple-choice vocabulary test, specifically designed to focus on descriptive texts and vocabulary related to animals. Both a pretest and a post-test were conducted. To ensure accuracy and consistency, the researcher conducted validity and reliability testing using IBM SPSS Statistics 21. According to Sundayana (2018), "an instrument is considered valid when it measures what it is intended to measure and reliable when it consistently produces the same results under the same conditions." Out of 25 items, 13 were validated and retained for analysis. Instrument reliability was verified using the Spearman-Brown formula, and classified according to Guilford's criteria, with results indicating high reliability.

The research procedure followed three stages: (1) administering the pre-test to both groups to determine baseline vocabulary mastery; (2) carrying out the treatment, in which the control group received conventional teaching while the experimental group employed mind mapping techniques; and (3) giving the post-test to both groups to evaluate the impact of the treatment. The mind mapping technique followed the Buzan (2006) model, in which students visually organize vocabulary using key words, branches, images, and colors. As Buzan states, "mind mapping is a creative and logical means of note-taking and note-making that literally maps out your ideas" Buzan, (2006). Students in the experimental group constructed mind maps thematically (e.g., habitat, food, appearance), while the control group used vocabulary lists and translation exercises.

The data gathered from the tests were analyzed using SPSS 21, employing multiple statistical methods, including validity and reliability tests, normality test (Kolmogorov-Smirnov), homogeneity test, and independent samples t-test. These steps helped determine whether the assumptions of normal distribution and equal variance were met, and whether the differences in test scores between groups were statistically significant. As E Wogu (2014) notes, "quasi-experimental research provides strong internal validity and is useful when random assignment is impractical or unethical." The results showed that the mind mapping technique had a statistically significant effect on vocabulary mastery, confirming that visual and associative learning methods offer meaningful advantages over traditional instruction.

RESULTS AND DISCUSSION
Results

The researcher examined how seventh-grade students at SMP Negeri 32 Semarang developed their vocabulary before and after using mind mapping techniques, with a focus on learning how to describe animals. Pre- and post-tests were used to gather data from the experimental group (VII G) and the control group (VII B) Conducted within two classroom meetings. In the experimental group, mind mapping was applied as a visual strategy to help students organize and connect vocabulary. Using 10

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multiple-choice questions, the researcher assessed vocabulary mastery and then analyzed the results using a paired t-test to evaluate the effectiveness of the technique.

1. Students' vocabulary mastery in English taught using mind mapping techniques in the experimental class.

Table 1. Pre-Test Results of Students Before Using Mind Mapping

Grade	Class of Interval	Performance level	F	f (%)
A	90-100	Excellent	5	16,67
B	80-89	Good	7	23,33
C	70-79	Adequate	6	20,00
D	60-69	Inadequate	6	20,00
E	< 60	Fail Level	6	20,00
	Total		30	100,00

The mean of the pre-test for the experimental class was calculated by the researcher using the following formula:

$$\bar{y}_1 = \frac{\sum yi}{N}$$
$$\bar{y}_1 = \frac{2090}{30}$$
$$\bar{y}_1 = 69{,}67$$

The experimental class's pre-test results showed that students' overall vocabulary proficiency level was comparatively low. Out of **30 students**, the mean score was **69.67,** placing the class on the border between "Adequate" and "Inadequate" achievement. Only **5 students (16.67%)** reached the **"Excellent (A)"** level, and **7 students (23.33%)** achieved the "Good (B)" category. Meanwhile, **6 students (20%)** were placed in **"Adequate (C)",** and the same number **6 students (20%)** scored in both **"Inadequate (D)"** and **"Fail Level (E)"** categories. This distribution shows that **40%** of students were still performing below standard, indicating the need for instructional innovation to boost learning outcomes.

Table 2. Post-Test Results of Students After Using Mind Mapping

Grade	Class of Interval	Performance level	f	f (%)
A	90-100	Excellent	12	40,00
B	80-89	Good	11	36,67
C	70-79	Adequate	4	13,33
D	60-69	Inadequate	3	10,00
E	< 60	Fail Level	0	0,00
	Total		30	100,00

The mean of the post-test for the experimental class was calculated by the researcher using the following formula:

$$\bar{y}_1 = \frac{\sum yi}{N}$$
$$\bar{y}_1 = \frac{2450}{30}$$
$$\bar{y}_1 = 81,67$$

Student performance in the experimental class significantly improved once mind mapping techniques were implemented. With the same total of 3**0 students**, the **mean post-test score increased to 81.67,** indicating a significant shift toward higher achievement levels. A total of **12 students (40%)** successfully attained the **"Excellent (A)"** category, while **11 students (36.67%)** earned scores in the **"Good (B)"** range. Only **4 students (13.33%)** were in the **"Adequate (C)"** category, and **3 students (10%)** fell into the **"Inadequate (D)"** level. Notably, **no students** remained in the **"Fail Level (E)"** category. This reflects a significant shift, not only in the average score but also in the qualitative distribution of student achievement across the class.

2. Students' vocabulary mastery in English taught conventional instruction in the control class.

Table 3. Pre-Test Results of Students Before Receiving Conventional Instruction

Grade	Class of Interval	Performance level	Ϝ	ƒ (%)
A	90-100	Excellent	5	16,67
B	80-89	Good	2	6,67
C	70-79	Adequate	7	23,33
D	60-69	Inadequate	8	26,67
E	< 60	Fail Level	8	26,67
	Total		30	100,00

The researcher calculated the control class pre-test mean using the following computation:

$$\bar{x}_1 = \frac{\sum \chi i}{N}$$
$$\bar{x}_1 = \frac{1890}{30}$$
$$\bar{x}_1 = 63$$

The pre-test data for the control class presented a more challenging picture. Among the **30 students,** the average score was **63.00,** indicating an overall "Inadequate" level overall. Only **5 students (16.67%)** scored in the **"Excellent (A)"** category, and just **2 students (6.67%)** reached the **"Good (B)"** level. A larger number, **7 students (23.33%)**, were categorized as **"Adequate (C)"**, while **8 students (26.67%)** scored in the **"Inadequate (D)"** range. Alarmingly, another **8 students (26.67%)** were in the **"Fail Level (E)"** category. These results highlight the substantial percentage over 50% of students needing improvement even before treatment began.

Table 4. Post-Test Results of Students After Receiving Conventional Instruction

Grade	Class of Interval	Performance level	F	f (%)
A	90-100	Excellent	12	40,00
B	80-89	Good	6	20,00
C	70-79	Adequate	7	23,33
D	60-69	Inadequate	4	13,33
E	< 60	Fail Level	1	3,33
	Total		30	100,00

The researcher calculated the control class post-test mean using the following computation:

$$\bar{x}_1 = \frac{\Sigma\chi i}{N}$$

$$\bar{x}_1 = \frac{2390}{30}$$

$$\bar{x}_1 = 79,67$$

After conventional instruction without the use of mind mapping, the control class showed improvement, although not as markedly as the experimental group. The **mean post-test score increased to 79.67**, indicating a general rise in vocabulary performance. Out of **30 students, 12 students (40%)** achieved scores in the **"Excellent (A)"** range, and **6 students (20%)** reached the **"Good (B)"** category. **7 students (23.33%)** remained at the **"Adequate (C)"** level, while **4 students (13.33%)** were still classified as **"Inadequate (D)".** Additionally, **1 student (3.33%)** remained in the **"Fail Level (E)"** group. Though the average score rose notably, the presence of students in the lowest two categories suggests that conventional teaching methods may still leave some learners behind.

3. The significant difference between mind mapping and conventional instructional methods.
   a. Normality Test

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
New Pretest Control	.122	30	.200[*]	.974	30	.644
New Postest Control	.173	30	.022	.947	30	.144
Pretest Experiment	.125	30	.200[*]	.949	30	.154
New Postest Experiment	.163	30	.040	.964	30	.393

[*]. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Figure 3.1 Normality Test Result

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The results are normally distributed because the Shapiro-Wilk Significance (Sig.) column indicates that the pre-test results for the control class (0.644 > 0.05) were both statistically significant. In the meantime, the experimental class's pre-test significance (Sig.) was 0.154 > 0.05, and the post-test result was 0.393 > 0.05, both of which showed a normal distribution. Therefore, it can be concluded that both classes have final results that are usually distributed.

b. Homogenity Test

Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
PretestResults	Based on Mean	.891	1	58	.349
	Based on Median	.758	1	58	.388
	Based on Median and with adjusted df	.758	1	53.006	.388
	Based on trimmed mean	.895	1	58	.348
PostestResults	Based on Mean	2.614	1	58	.111
	Based on Median	2.816	1	58	.099
	Based on Median and with adjusted df	2.816	1	57.804	.099
	Based on trimmed mean	2.416	1	58	.126

Figure 3.2 Homogenity Test Result

The difference between class G and class B in vocabulary mastering utilizing mind mapping for descriptive text material is statistically homogeneous, according to the significance value (Sig.) of 0.349, which is higher than 0.05. Therefore, it is confirmed that both groups share similar variance when the null hypothesis (H_0) is accepted and the alternative hypothesis (H_a) is rejected.

c. Paired Sample T-test

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	New Pretest Kontrol - New Postest Kontrol	.00000000	19.80374229	3.61565212	-7.39483890	7.39483890	.000	29	1.000
Pair 2	Pretest Eksperimen - New Postest Eksperimen	69.66666667	17.87185603	3.26293956	62.99320595	76.34012739	21.351	29	.000

Figure 3.3 T-test Result

Based on the output pair 1, the value of Sig. (2-tailed) of 1.000 > 0.05, it can be concluded that there is no difference in the average student learning outcomes between the Pre-test control class and Post-test control class (traditional method).

The results of pair 2 indicate that there is a difference between the average student learning outcomes for the pre-test experimental class and post-test experimental class (using the mind mapping technique), with a significant difference Sig. (2-tailed) value of 0.000 < 0.05.

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Based on the learning results of pair 2, we can conclude that H$_o$ is rejected. H^a is accepted, indicating that employing the mind mapping technique in descriptive text learning material with the theme of describing animals led to improved vocabulary acquisition outcomes.

Discussion

The results of this study highlight that the use of mind mapping techniques has a significant impact on improving students' vocabulary skills, especially when learning descriptive texts. Students in the experimental group, who were exposed to mind mapping during instruction, demonstrated notable progress in vocabulary acquisition, as reflected in their post-test scores. This improvement is linked to the way mind mapping allows learners to visualize, associate, and organize new words more meaningfully. Mind maps stimulate mental activity by engaging both hemispheres of the brain, encouraging deeper processing of language and more lasting retention, as emphasized by Buzan, (2006).

A comparative analysis of both groups revealed that the experimental class outperformed the control class, with a higher mean score achieved after treatment. While the control class, which was taught using traditional methods, also made progress, several students remained in the lower performance categories. This finding suggests that conventional vocabulary instruction, often centered on repetition and translation, is less effective in promoting comprehensive understanding and long-term memory. These outcomes are consistent with previous research, such as that by Aziz & Yamat, (2016) and (A Tahrin & D Wowor (2018), which also confirmed that mind mapping can boost vocabulary development more effectively than standard teaching approaches.

In addition, the mind mapping approach used in this study aligns with the instructional model proposed by Micheline Chalhoub-Deville, Carol A. Chapelle (2016), which emphasizes the integration of teaching methods, learning experiences, and assessment strategies. By using descriptive themes such as animal traits, students were able to categorize and connect vocabulary within a thematic structure. This method supports a deeper level of understanding, where students learn not only to recognize individual words but also to relate them meaningfully within context. Consequently, vocabulary mastery is developed through concept association rather than simple memorization.

To conclude, this study provides strong evidence that mind mapping is an effective teaching strategy for enhancing students' vocabulary mastery at the junior high school level. The statistical results, particularly the t-test with a significance value of 0.000, confirm that the difference in outcomes between the experimental and control groups is meaningful. Thus, the alternative hypothesis is accepted. Mind mapping should be considered a valuable and student-friendly method for English teachers aiming to create more engaging and productive learning environments that foster both understanding and independence in vocabulary learning.

CONCLUSION

The conclusion of this research highlights the effectiveness of implementing mind mapping techniques in boosting vocabulary mastery among seventh-grade students at SMP Negeri 32 Semarang, particularly in the context of descriptive texts about animals, during the 2024–2025 academic year. The main findings are presented as follows:

1. Students taught using mind mapping techniques showed a clear improvement in vocabulary mastery. After the treatment, more students reached the "Excellent" and "Good" categories, indicating that mind mapping effectively supports vocabulary learning through visual organization and meaningful associations.

2. Students taught using traditional methods experienced some improvement, but it was less significant. Several students remained in lower achievement levels, showing that conventional techniques may not fully meet students' learning needs.

3. A significant difference between the two groups was verified by the t-test results (Sig. 0.000 < 0.05), indicating that mind mapping is statistically more effective than traditional methods in enhancing students' vocabulary mastery. Thus, the alternative hypothesis is accepted.

REFERENCES

A Tahrin, D Wowor, N. L. (2018). *Increasing Students ' Vocabulary Through Mind Mapping Technique In Developing Students ' Vocabulary Mastery at Smp Negeri 1 Remboken Agutinus Tahrin , Diana J . Wowor , Nihta Liando The study aims of this research is to find out whether the use of mind ma*. http://repository.unima.ac.id/handle/123456789/267

Al Shdaifat, S., Al-Haq, F. A. A., & Al-Jamal, D. (2019). The impact of an E-mind mapping strategy on improving basic stage students' english vocabulary. *Jordan Journal of Modern Languages and Literatures*, *11*(3), 385–402. https://www.ijoes.in/papers/v4i8/9.IJOES-ateiii(55-65).pdf

Anjari, H. C., Sumardiyani, L., & Yulianti, F. (2024). Teaching Written Descriptive Texts Using Mind Maps for Junior High School Students. *Lingua Franca*, *3*(1), 1–22. https://doi.org/10.37680/lingua_franca.v3i1.2718

Aziz, A. B. A., & Yamat, H. B. (2016). The use of mind mapping technique in increasing students' vocabulary list. *Journal of Education and Social Sciences*, *4*, 105–113.

Buzan, T. (2006). *The Ultimate Book of Mind Maps*. 542. http://books.google.com/books?id=v4-D6Pu_9bAC&pgis=1

Caron, J., & Markusen, J. R. (2016). *Metodologi Penelitian*. K-Media. https://www.scribd.com/document/447943875/METODOLOGI-PENELITIAN

Davies, M. (2011). Concept mapping, mind mapping and argument mapping: What are the differences and do they matter? *Higher Education*, *62*(3), 279–301. https://doi.org/10.1007/s10734-010-9387-6

E Wogu, O. (2014). Relevance of Experimental Design. *European Journal of Business and Management Www.Iiste.Org ISSN*, *6*(6), 108–115. https://iiste.org/Journals/index.php/EJBM/article/view/11131

Edwards, S., & Cooper, N. (2010). Mind mapping as a teaching resource. *Clinical Teacher*, *7*(4), 236–239. https://doi.org/10.1111/j.1743-498X.2010.00395.x

Megawati, M., Yuliwati, Y., & Harimurti, E. R. (2021). The Effect Mind Mapping Technique And Vocabulary Mastery on Student's Writting Skill. *Journal of English Educational Study (JEES)*, *4*(1), 1–10. https://doi.org/10.31932/jees.v4i1.793

Micheline Chalhoub-Deville, Carol A. Chapelle, P. D. (2016). *Inference and Generalizability in Applied Linguistics Multiple perspectives* (Issue 0). John Benjamins.

Sangid, A., & Muhib, M. (2019). Strategi Pembelajaran Muhadatsah. *Tarling : Journal of Language*

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Education, 2(1), 1–22. https://doi.org/10.24090/tarling.v2i1.2226

Sugiyono, D. (2013). *Metode Penelitian Kuantitatif, Kualitatif, dan Tindakan*.

Sundayana, H. R. (2018). *Statistika penelitian pendidikan*.

Syafitri, Y., Budiawan, R. Y. S., & Kurniawan, L. A. (2023). Penerapan Model Mind Mapping Terhadap Pembelajaran Teks Eksplanasi pada Peserta Didik Kelas XI SMA Laboratorium UPGRIS Tahun 2022/2023. *Jurnal Tunas Pendidikan*, 6(1), 149–158.

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