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Article

The Use of Word Maps in Vocabulary Development of the Eleventh Grade Students of SMA Negeri 1 Sindue

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A B S T R A C T

This research aimed to examine the effectiveness od using the Word Maps technique on students' vocabulary development of the eleventh grade at SMA Negeri 1 Sindue. The study employed a quasi-experimental design involving two classes: an experimental class taught using Word Maps and a control class taught using conventional method. The participants were selected through purposive sampling, consisting of 26 students in the experimentsl class and 29 students in the control class. Data were collected using pre-test and post-test, which assessed vocabulary knowledege in terms of meaning, spelling, synonyms/antonyms, and word usage in context. The results revealed that the experimental class class mean score improved significantly from 44.71 to 62.01, while the control class only improved slightly from 44.13 to 47.67. The independent sample t-test indicated a p-value of 0.001 < 0.05, confirming a statistically significant difference between the two classes.

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INTRODUCTION

English is a widely recognized foreign language in Indonesia and is often associated with the pursuit of quality education, both domestically and internationally (Swarniti, 2019). As a global lingua franca, English plays a vital role in educational and professional advancement. Language, in general, is considered the most essential and universal tool of communication (Swarniti, 2021). In the Indonesian education system, English is a compulsory subject taught in both junior and senior high schools. Students are expected to acquire proficiency in the four primary language skills: listening, speaking, reading, and writing. Central to these skills is vocabulary knowledge, which serves as the foundation of language competence.

Vocabulary is often cited as one of the most important aspects of language learning, as it directly affects the learner's ability to use language meaningfully (Nation, 2001; Schmitt, 2000). Nathan (2013) argues that communication cannot occur in any meaningful way without an adequate vocabulary base. This highlights that mastering vocabulary is arguably more critical than grammar for effective language use. Vocabulary enables learners to express ideas clearly and understand input across all language skills (Richards & Renandya, 2002).

Despite its importance, many Indonesian students still face significant challenges in vocabulary acquisition. At the high school level, vocabulary instruction is designed to build sufficient word knowledge to support communication across language skills. However, factors such as unfamiliar word forms, lack of exposure, and minimal engagement often hinder progress. Nation (2001) emphasizes that effective vocabulary teaching should focus on high-frequency words, their meanings, and contextual usage to ensure communicative competence.

Teachers employ various techniques to make vocabulary learning more interactive, such as contextual teaching, visual aids, and real-life applications. Among these, the word map technique stands out for its effectiveness in promoting conceptual understanding. According to Graves (2008), word maps are powerful instructional tools that help learners build relationships between words by linking definitions, synonyms, antonyms, and sentence usage. This visual approach encourages deeper processing and retention of vocabulary.

Preliminary observations and teacher interviews at SMA Negeri 1 Sindue revealed that students struggled to master English due to limited vocabulary, affecting their performance in classroom activities. Many students found it difficult to interpret vocabulary in context, particularly due to discrepancies between pronunciation and spelling. These challenges underscored the need for more engaging and supportive instructional strategies.

Therefore, this study proposes the use of the word maps technique as an effective solution for vocabulary development. It is expected that this method will improve students' ability to understand and use vocabulary more confidently and accurately.

METHOD

The study will use a quasi-experimental design, with an experimental class taught using word maps and a control class taught conventionally. The research will be conducted four weeks. Pre-test and post-test will be given to both groups to measure their development in vocabulary mastery. The study will use a research design by Cohen et al (2007:283) as follows:

Experimental	O1	X	O2
Control	O3		O4

Where:
O1 : The Pre-Test of Experimental Group
O2 : The Post-Test of Experimental Group
O3 : The Pre-Test of Control Group
O4 : The Post-Test of Control Group
X : The Treatment of Experimental Group

The participants consisted of 55 eleventh-grade students from SMA Negeri 1 Sindue. The sample was selected using purposive sampling, with 26 students in the experimental class (XI D) and 29 students in the control class (XI E).

Pre-test and post-test were administered to both class to asses vocabulary development. The test comprised multiple-choice, matching words, and scrambled letters with total 40 points. The treatment for the experimental class involved four sessions incorporating word map activities on selected topics. Data were analyzed using SPSS version 30, including normality, homogeneity, and independent t-test.

Instruments

According to Adib (2021), a research instrument is a tool for data collection, measurement, and analysis. In this study, the researcher will conduct a vocabulary test to find out if there is a significant difference in vocabulary development between eleventh-grade students at SMA Negeri 1 Sindue who are taught with word maps and those who are not. A scoring method will be used to determine the students levels of vocabulary ability.

Data Analysis

To analyze the data, the researcher will calculate the students' scores after cheeking their answer in the pre-test and in the post-test. The independent sample t-test will be used to examine the data in this study simple data analysis from SPSS (Statistical Package for the Social Sciences), also known as unpaired sample analys a statistical approach for analyzing data from researcher involving two groups that receive different treatments. As a result, the data exists in quantitative form. Inferential satatistics will be used to analyze the data. This statistical analysis is appropriate for answering problem statement.

FINDINGS AND DISCUSSION

Findings

This chapter shows the findings of data obtained through pre-test and post-test administered to the experimental and control class. The research was conducted at SMA Negeri 1 Sindue from May 19 to June 10 2025, involving grade XI students, with class XI D serving as the experimental class and class XI E as the control class. Both groups were given a pre-test to measure their initial vocabulary knowledge. While the post-test was administered to them in order to find out the students' improvement after the treatment. The comparison of pre-test and post-test results was used to determine the impact of the Word Maps technique on students' vocabulary development.

Table 1 Pre-test Results of the Experimental Class

No.	Initial	Maximum Score	Part A Score	Part B Score	Part C Score	Total Score Raw Score	Standard Score
1	A	40	8	5	2	19	47.5
2	AF	40	7	4	2	17	42.5
3	AMR	40	6	4	0	10	25
4	AR	40	9	6	1	18	45
5	ARA	40	10	7	3	26	65
6	AS	40	7	5	2	18	45
7	F	40	5	4	1	12	30
8	FA	40	6	4	1	13	32.5
9	FI	40	8	7	0	15	37.5
10	IN	40	10	8	2	24	60
11	MF	40	8	5	1	16	40
12	MSI	40	6	7	1	16	40
13	NF	40	9	6	2	21	52.5
14	NN	40	11	5	3	31	62.5
15	NV	40	8	7	0	15	37.5
16	Q	40	6	5	1	14	35
17	R	40	9	6	3	24	60
18	RA	40	12	7	2	25	62.5
19	RS	40	9	5	1	17	42.5
20	RT	40	6	3	1	12	30
21	RTH	40	7	6	2	19	47.5
22	RTU	40	8	7	1	18	45
23	S	40	5	6	1	14	35
24	SA	40	9	8	2	23	57.5
25	SAR	40	7	7	1	17	42.5
26	SP	40	8	6	1	17	42.5
	Total		204	150	37	471	1162.5
	Mean						44.71

Table above shows that students' total score in experimental class is 1162.5 where the highest score was 65 and the lowest score was 25. The result of the pre-test in control class can be seen in table below.

Table 2 Pre-test Results of the Control Class

No.	Initial	Maximum Score	Part A Score	Part B Score	Part C Score	Total Score Raw Score	Standard Score
1	AAA	40	10	4	2	20	50
2	AAH	40	9	5	1	17	42.5
3	AAK	40	11	4	2	21	52.5
4	AB	40	6	5	1	14	35
5	AFF	40	9	6	0	15	37.5
6	AJDAS	40	8	5	1	16	40
7	AL	40	8	4	2	18	45
8	AN	40	8	6	0	14	35
9	AR	40	7	7	1	17	42.5
10	ARR	40	7	5	2	18	45
11	AU	40	8	6	1	17	42.5
12	AUR	40	8	6	1	17	42.5
13	CRK	40	5	4	2	15	37.5
14	DA	40	6	5	1	14	35
15	FRR	40	8	6	3	23	57.5
16	IE	40	7	3	2	16	40
17	II	40	9	4	2	19	47.5
18	IHH	40	8	6	0	14	35

19	KG	40	9	7	1	19	47.5
20	LI	40	12	6	3	27	67.5
21	MA	40	7	6	1	16	40
22	MAR	40	9	7	1	19	47.5
23	MFA	40	6	5	0	11	27.5
24	MN	40	7	8	0	15	37.5
25	NJ	40	6	6	2	18	45
26	NO	40	9	6	1	18	45
27	RA	40	8	4	2	18	45
28	RK	40	12	7	2	25	62.5
29	SA	40	9	6	2	21	52.5
	Total		236	159	39	512	1280
	Mean						44.13

Table above shows that students' total score in control class is 1280 where the highest score was 67.5 and the lowest score was 27.5.

Table 3 Post-test Results of the Experimental Class

No.	Initial	Maximum Score	Part A Score	Part B Score	Part C Score	Total Score Raw Score	Standard Score
1	A	40	11	7	3	27	67.5
2	AF	40	9	6	2	21	52.5
3	AMR	40	8	6	2	20	50
4	AR	40	12	8	2	26	65
5	ARA	40	12	8	4	32	80
6	AS	40	9	7	2	22	55
7	F	40	8	6	2	20	50
8	FA	40	8	7	1	18	45
9	FI	40	10	9	1	22	55
10	IN	40	13	10	3	32	80
11	MF	40	10	7	2	23	57.5
12	MSI	40	9	8	2	23	57.5
13	NF	40	12	8	3	29	72.5
14	NN	40	15	6	5	36	90
15	NV	40	10	7	2	23	57.5
16	Q	40	9	6	2	21	52.5
17	R	40	11	5	3	25	62.5
18	RA	40	14	7	5	36	90
19	RS	40	12	6	2	24	60
20	RT	40	9	5	2	20	50
21	RTH	40	9	6	2	21	52.5
22	RTU	40	10	8	2	24	60
23	S	40	8	8	2	22	55
24	SA	40	12	10	2	28	70
25	SAR	40	10	8	1	21	52.5
26	SP	40	11	9	3	29	72.5
	Total		271	188	62	645	1612.5
	Mean						62.01

Table above shows that students' total score in experimental class is 1612.5 where the highest score was 90 and the lowest score was 45.

Table 4 Post-test Results of the Control Class

No.	Initial	Maximum Score	Part A Score	Part B Score	Part C Score	Total Score Raw Score	Standard Score
1	AAA	40	11	5	2	22	55
2	AAH	40	10	4	1	17	42.5
3	AAK	40	12	6	2	24	60
4	AB	40	7	6	1	16	40
5	AFF	40	8	6	0	14	35
6	AJDAS	40	8	7	1	18	45
7	AL	40	9	5	2	20	50
8	AN	40	10	7	0	17	42.5
9	AR	40	9	8	1	20	50
10	ARR	40	8	6	2	20	50
11	AU	40	8	8	1	19	47.5
12	AUR	40	7	7	1	17	42.5
13	CRK	40	7	5	2	18	45

14	DA	40	7	6	1	16	40
15	FRR	40	9	6	3	24	60
16	IE	40	6	5	2	17	42.5
17	II	40	9	6	2	21	52.5
18	IHH	40	8	7	0	15	37.5
19	KG	40	10	8	1	21	52.5
20	LI	40	13	7	3	29	72.5
21	MA	40	8	5	1	16	40
22	MAR	40	8	7	1	18	45
23	MFA	40	7	6	0	13	32.5
24	MN	40	8	8	0	16	40
25	NJ	40	8	6	2	20	50
26	NO	40	10	7	1	20	50
27	RA	40	8	5	2	19	47.5
28	RK	40	12	5	2	23	57.5
29	SA	40	9	8	2	23	57.5
	Total		254	182	39	553	1382.5
	Mean						47.67

The table above indicated that students' total score in control class is 1382.5 where the highest score was 72.5 and the lowest score was 32.5. after the data were calculated, it can be seen that the mean score of the post-test of control class was 47.67, which is lower than the mean score of the experimental class.

Table 5 Descriptive Statistic

	N	Minimum	Maximum	Mean	Std. Deviation
Pre-test Experimental	26	25.00	65.00	44.7115	11.09790
Post-test Experimental	26	45.00	90.00	62.0192	12.38990
Pre-test Control	29	27.50	67.50	44.1379	8.61570
Post-test Control	29	32.50	72.50	47.6724	8.65848
Valid N (listwise)	26				

The table provides a concise comparison of student performance. In the experimental class, pre-test scores ranged from 25.00 to 65.00, while post-test scores ranged from 45.00 to 90.00. The control class had pre-test scores ranging from 27.50 to 67.50 and post-test scores between 32.50 and 72.50. The experimental class showed a clear increase in mean scores from 44.71 to 62.01, while the control class only slightly improved from 44.13 to 47.67. Standard deviation values revealed more consistent improvement in the experimental class. These findings suggest that the word map technique significantly improved students' vocabulary development.

		Shapiro-Wilk		
	Class	Statistic	df	Sig.
Students learning score	Pre-test Experimental	.949	26	.222
	Post-test Experimental	.893	26	.061
	Pre-test Control	.943	29	.124
	Post-test Control	.959	29	.305

Figure 1 Test of Normality

The table above shows that the significance value for the experimental class is 0.222 (pre-test) and 0.061 (post-test), while for the control class it is 0.124 (pre-test) and 0.305 (post-test). Since all significance values are greater than the alpha level (α = 0.05), the null hypothesis is accepted. This indicates that the data in both classes are normally distributed. After confirming normality, the homogeneity of variance was also tested.

Table 6 Test of Homogeneity Variance

		Levene Statistic	df1	df2	Sig.
Students learning outcomes	Based on Mean	2.097	3	106	.105
	Based on Median	1.173	3	106	.324
	Based on Median and with adjusted df	1.173	3	89.174	.325
	Based on trimmed mean	1.913	3	106	.132

Based on the table above, the homogeneity test of the mean was 0.132. As a result, the significance was greater than 0.05 (0.132 > 0.05). It means that the data in the experimental and control classes were all same.

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Learning students outcomes	Equal variances assumed	.438	.511	-5.306	50	<.001	-17.308	3.262	-23.860	-10.756
	Equal variances not assumed			-5.306	49.406	<.001	-17.308	3.262	-23.862	-10.754

Figure 2 Independent Sample T-test

If the p-value is greater than the alpha level, the null hypothesis is accepted; if it is lower, the alternative hypothesis is accepted. Based on the table above, the p-value (0.001) is lower than the alpha level (0.05), indicating that the word map technique significantly affects students' vocabulary development at SMA Negeri 1 Sindue. Thus, the null hypothesis (Ho) is rejected, and the alternative hypothesis (Ha) is accepted. This means that the technique has a meaningful impact on vocabulary improvement.

Disussion

This study aimed to examine the effectiveness of using word maps in developing students' vocabulary, with a specific focus on parts of speech—verbs, nouns, and adjectives. A vocabulary test was used as the research instrument, consisting of a pre-test, treatment, and post-test. The pre-test was administered to both the experimental group (26 students) and the control group (29 students) to assess their initial vocabulary knowledge. The results showed that both groups had similarly low scores, with the experimental group scoring a mean of 44.71 and the control group 44.13, indicating limited understanding and application of vocabulary in context.

The experimental group received treatment over four meetings using the word map technique, where students explored vocabulary through definitions, synonyms/antonyms, use in sentence, and draw a picture. This visual and interactive approach aimed to enhance vocabulary retention and contextual use. In contrast, the control group was taught using conventional methods that focused more on direct instruction and less student engagement.

After the treatment, the post-test results showed a significant improvement in the experimental group's mean score (62.01) compared to the control group (47.67). An independent samples t-test confirmed the difference was statistically significant ($p < 0.001$), indicating that the word map technique effectively improved students' vocabulary development. The use of word maps not only supported comprehension but also increased motivation and classroom participation, making vocabulary learning more meaningful and engaging for students.

CONCLUSIONS

Based on the findings and discussion, it can be concluded that the word maps technique effectively enhances the vocabulary development of eleventh-grade students at SMA Negeri 1 Sindue. The independent samples t-test showed a p-value lower than the alpha level (0.001 < 0.05), indicating a statistically significant difference between the experimental and control groups. Therefore, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_a) is accepted. Students in the experimental class demonstrated improved understanding of word meanings, sentence construction, and active vocabulary use. Through word map activities—such as defining words, identifying synonyms and antonyms, using words in sentences, and creating illustrations—students developed a deeper grasp of vocabulary. In contrast, students taught using conventional methods showed less progress. In summary, word maps had a significant positive effect on students' vocabulary knowledge, motivation, engagement, and confidence in using English. The scope of this study was limited to examining the effectiveness of the word maps technique in supporting vocabulary development, particularly focusing on nouns, verbs, and adjectives. It also addressed components such as meaning, spelling, synonyms/antonyms, and word usage in context. This targeted approach aimed to yield more

accurate findings on how word maps aid vocabulary learning among eleventh-grade students at SMA Negeri 1 Sindue. In terms of practical implications, this study provides valuable insights for English teachers regarding vocabulary instruction and offers word mapping as a viable method to enhance student engagement and learning outcomes. It also encourages the adoption of more innovative teaching strategies. For students, word maps foster a more interactive and supportive learning environment, making vocabulary acquisition more accessible. Furthermore, the study can serve as a reference for future research in vocabulary development and language instruction across various educational contexts.

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