

CHAPTER IV

FINDINGS AND DISCUSSION

Before presenting the findings, this chapter begins by explaining the process of data analysis used in this study. The goal of this chapter is to present and analyze the outcomes of the pre-test and post-test administered to both the treatment and control groups. The primary purpose is to investigate whether using YouTube videos as a brainstorming tool has a substantial impact on students' vocabulary mastery.

The gathered data were analyzed using SPSS (Statistical Package for the Social Sciences) version 26 to perform normality tests, independent samples t-test, and paired samples t-test. These assessments were used to determine whether there were significant differences in student scores before and after therapy, as well as between treatment and control groups. The significance level (alpha) used in this study is **0.05**.

A. Findings

This part displays the outcomes of data analysis carried out to answer the research questions and test the hypotheses proposed in Chapter I. The findings are structured based on the stages of analysis, including descriptive statistics, assumption testing (normality and homogeneity), and inferential statistical tests (independent and paired samples t-tests). The aim is to determine whether the use of YouTube videos as brainstorming media significantly affects students' vocabulary mastery.

1. Effectiveness of implementing the Brainstorming Technique through English YouTube Videos in enhancing students' Vocabulary skills

This subsection provides a general overview of the students' vocabulary mastery before and after the treatment. The analysis covers both the treatment and control groups. The data obtained from the pre-test and post-test results are used to evaluate students' initial ability and their improvement after the intervention.

The pre-test was used to assess students baseline vocabulary knowledge before to treatment. Following the session, both groups were given a post-test to determine any increase in vocabulary mastery. The descriptive statistics for the treatment and control groups in the pre-test and post-test phases are shown in the table below, along with the mean, minimum, maximum, and standard deviation.

Table 4. 1 Students' Pre-Test Post-Test Value

NO	Students' Initial	Groups	Nilai Pre-Test	Nilai Post-Test
1	AN	T	88.5	96.0
2	NAP	T	88.0	96.0
3	ANH	T	40.0	70.5
4	ARG	T	28.0	77.0
5	HN	T	43.0	84.0
6	HN	T	69.5	88.5
7	I	T	57.5	73.0
8	LNAP	T	50.0	70.5
9	SNA	T	29.0	82.0
10	MRA	T	56.0	86.0
11	MS	T	40.0	82.0

12	NC	T	40.0	73.0
13	NHH	T	73.0	86.0
14	NA	T	77.0	88.0
15	SM	T	50.0	82.5
16	SS	C	35.0	57.5
17	SY	C	30.0	43.5
18	FZ	C	32.5	50.0
19	MAB	C	27.0	40.0
20	MR(K1)	C	24.0	43.5
21	MR	C	35.0	50.0
22	MS	C	21.0	41.5
23	MY	C	32.0	53.5
24	AR	C	30.0	48.0
25	NR	C	43.0	57.5
26	MR(K2)	C	31.5	48.0
27	MA	C	30.0	45.0
28	MDR	C	41.5	53.5
29	MF	C	36.0	41.5
30	ML	C	43.0	56.0
Mean			44.03	65.46
Standard Deviation			18.47	18.56

Pursuant to the descriptive analysis, the aggregate mean score of the students' vocabulary test was 44.03, with a standard deviation of 18.47. The lowest score earned was 21, and the best was 96. These results indicate a wide range of vocabulary proficiency among students, suggesting considerable variation in their prior knowledge and vocabulary development. The relatively high standard deviation reflects a diverse spread of scores around the mean. This descriptive summary provides a foundation for interpreting whether the treatment, using YouTube videos as a brainstorming medium, had a statistically significant impact, as explored in the subsequent inferential analysis.

To provide a deeper understanding of the students' vocabulary mastery levels, the test scores were also classified into five levels: Excellent, Good, Fair, Poor, and Very Poor. This classification helps to identify not only average performance but also the distribution of students across achievement levels.

Table 4. 2 Classification Students' Score

NO.	Classification	Score
1.	Excellent	86-100
2.	Good	71-85
3.	Fair	56-70
4.	Poor	41-55
5.	Very Poor	< 40

Table 4. 3 Pre-Test Score Classification

Level	Score	Number of Students	Percentage
Excellent	86-100	2	6.67%
Good	71-85	3	10.00%
Fair	56-70	2	6.67%
Poor	41-55	6	20.00%
Very Poor	<40	17	56.67%

Based on the pre-test results, the majority of students (56.67%) were categorized as **Very Poor**, indicating that most students had low vocabulary proficiency before the treatment. Only 6.67% of the students achieved an **Excellent** level, while the rest were distributed

across **Poor** (20.00%), **Good** (10.00%), and **Fair** (6.67%) levels. This clearly demonstrates a need for vocabulary enhancement.

Table 4. 4 Post-Test Score Classification

Level	Score	Number of Students	Percentage
Excellent	86-100	6	20.00%
Good	71-85	5	16.67%
Fair	56-70	7	23.33%
Poor	41-55	11	36.67%
Very Poor	<40	1	3.33%

After the treatment, the post-test results showed a significant shift in performance. The number of students classified as **Excellent** increased to 20.00%, while those at the **Fair** level rose to 23.33%. Moreover, the proportion of students in the **Very Poor** category decreased sharply to just 3.33%, reflecting a substantial improvement. The redistribution of student performance indicates the effectiveness of YouTube-based brainstorming in promoting vocabulary mastery.

a. Assumption Checks

Before conducting inferential statistical tests, such as the independent samples t-test and paired samples t-test, it is essential to examine whether the data meet the basic assumptions required for parametric testing. These assumptions include the normal distribution of the data and the homogeneity of

variances between groups. Verifying these assumptions ensures the validity of the statistical tests and the accuracy of the conclusions drawn from the data. The following sub-sections present the results of the normality and homogeneity tests applied to the vocabulary scores.

b. Normality Test

To assess whether the data were normally distributed, the Shapiro-Wilk test was used to calculate pre- and post-test scores in the treatment and control groups. The findings are presented in the table below.

The Shapiro-Wilk test was used to examine the normality of the data, which is appropriate for small sample sizes ($n < 50$). The results are presented in the table below:

Table 4. 5 Test of Normality

Tests of Normality							
	Kelompok	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Nilai pretest	1	.139	15	.200*	.931	15	.285
	2	.134	15	.200*	.954	15	.582
Nilai posttest	1	.151	15	.200*	.935	15	.326
	2	.135	15	.200*	.929	15	.268

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

a. Lilliefors Significance Correction

All significance values are greater than 0.05, indicating that the data for both pre-test and post-test scores in each group is normally distributed. This result validates the use of parametric tests in the next steps of the analysis.

c. Homogeneity Test

To determine whether the variances of the post-test scores between the treatment and control groups were equal, Levene's Test for Equality of Variances was conducted. The result is presented in the following table. To examine the equality of variances between the two groups, Levene's test for equality of variances was applied to the post-test scores:

Table 4. 6 Test of Homogeneity

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Nilai posttest	Equal variances assumed	.905	.350	12.785	28	.000	33.7333	2.6385	28.3286	39.1380

Equal variances not assumed			12.785	25.569	.000	33.7333	2.6385	28.3054	39.1613
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Since the significance value is greater than 0.05, the variances between the treatment and control groups are considered homogeneous. Therefore, the data meet the assumption of homogeneity.

2. Comparasion the vocabulary skills of students before and after the implementation of the Brainstorming Technique through English YouTube Videos

a. The Result of Statistical Comparison between Treatment and Control Groups

This section displays the findings of the independent samples t-test, which was used to assess whether there was a significant difference in vocabulary mastery between the treatment and control groups following treatment.

2) Independent Sample T-test

The post-test scores from both the treatment and control groups were used to perform an independent samples t-test. The study sought to see whether using YouTube videos as a brainstorming tool resulted in a statistically significant difference in vocabulary mastery. The result is presented in the following

table. An independent samples t-test was conducted to compare the post-test scores of the treatment and control groups. The results are shown in the following table:

Table 4. 7 Independent Sample T-Test

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
Nilai posttest	Equal variances assumed	.905	.350	12.785	28	.000	33.7333	2.6385	28.3286	39.1380
	Equal variances not assumed			12.785	25.569	.000	33.7333	2.6385	28.3054	39.1613

The significance value (0.000) is lower than 0.05, indicating that there is a statistically significant difference in vocabulary mastery between students who were taught using YouTube videos as brainstorming media and those who were not

(only use conventional learning). This supports the first hypothesis (H_a) of the study.

a. The Result of Statistical Comparison between Pre-Test and Post-Test of Treatment Group

This section covers the findings of the paired samples t-test, which was performed within the treatment group to see whether there was a significant improvement in students' vocabulary mastery following the installation of YouTube-based brainstorming activities.

1) Paired Sample T-test

The treatment group's pre- and post-test scores were compared using a paired samples t-test. The goal was to see if the treatment involving YouTube videos had a statistically significant effect on students' vocabulary knowledge. The results are shown below. To evaluate whether there was a significant change in vocabulary mastery within the treatment group, a paired samples t-test was performed comparing the pre-test and post-test scores:

Table 4. 8 Paired Sample T-Test

Paired Samples Test

Paired Differences

t

df

		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				Sig. (2-tailed)
					Lower	Upper			
Pair 1	Nilai pretest - Nilai posttest	-27.0333	14.8810	3.8423	-35.2742	-18.7925	-7.036	14	.000

The p-value (0.000) is less than 0.05, indicating a significant improvement in the students' vocabulary mastery after the use of YouTube videos as a brainstorming medium. This finding supports the second hypothesis (H_a) and demonstrates the effectiveness of the treatment.

2) N-Gain Score Analysis

After presenting the results of the paired samples t-test for the treatment group, an N-Gain analysis was conducted to provide further insight into the effectiveness of the YouTube-based brainstorming strategy.

The N-Gain values for each student in the treatment group were calculated and analyzed. Based on the classification by Hake (1999), the average N-Gain score for the treatment group was found to be in the moderate range, indicating meaningful learning improvement. The following table presents the distribution of N-Gain categories among the treatment group students:

Table 4. 9 Student's N-Gain Value

NO	Students' Initial	Groups	Nilai Pre-Test	Nilai Post-Test	N-Gain
1	AN	T	88.5	96.0	.65
2	NAP	T	88.0	96.0	.67
3	ANH	T	40.0	70.5	.51
4	ARG	T	28.0	77.0	.68
5	HN	T	43.0	84.0	.72
6	HN	T	69.5	88.5	.62
7	I	T	57.5	73.0	.36
8	LNAP	T	50.0	70.5	.41
9	SNA	T	29.0	82.0	.75
10	MRA	T	56.0	86.0	.68
11	MS	T	40.0	82.0	.70
12	NC	T	40.0	73.0	.55
13	NHH	T	73.0	86.0	.48
14	NA	T	77.0	88.0	.48
15	SM	T	50.0	82.5	.65
16	SS	C	35.0	57.5	.35
17	SY	C	30.0	43.5	.19
18	FZ	C	32.5	50.0	.26
19	MAB	C	27.0	40.0	.18
20	MR(K1)	C	24.0	43.5	.26
21	MR	C	35.0	50.0	.23
22	MS	C	21.0	41.5	.26
23	MY	C	32.0	53.5	.32
24	AR	C	30.0	48.0	.26
25	NR	C	43.0	57.5	.25
26	MR(K2)	C	31.5	48.0	.24
27	MA	C	30.0	45.0	.21
28	MDR	C	41.5	53.5	.21
29	MF	C	36.0	41.5	.09
30	ML	C	43.0	56.0	.23
Category		Number of Students		Percentage	
High		3		20.0%	
Moderate		12		80.0%	

B. Discussion

1. The Effectiveness of Brainstorming via YouTube in Enhancing Vocabulary Mastery

The results of this study show a statistically significant difference in vocabulary knowledge between students who were taught using YouTube videos as a brainstorming medium and those who were taught using traditional techniques. The results of the independent samples t-test revealed that the treatment group performed considerably better than the control group. ($t(28) = 12.785, p = 0.000$). This demonstrates the positive effect of YouTube-based brainstorming activities in improving students' vocabulary mastery.

The integration of YouTube videos as brainstorming media aligns with Osborn's brainstorming theory, which emphasizes the role of idea generation through visual and contextual cues. Brainstorming, according to Osborn (as cited in Pakiding (2022)), is most effective when learners are encouraged to generate ideas freely and creatively without fear of judgment. In the present study, YouTube videos served as powerful stimuli to activate students' prior knowledge and imagination. The visual content provided authentic and contextualized language input that helped students associate new vocabulary with meaningful concepts and situations.

In line with this, Silaen (2023) and Sutarti & Astuti (2021) emphasized that YouTube provides rich and dynamic learning experiences by delivering real-life situations, audiovisual stimuli, and exposure to native-like language use. This helps bridge the gap between passive language recognition and active vocabulary usage, enhancing both receptive and productive vocabulary. As seen in the students' post-test results, the treatment group demonstrated considerable improvement, validating the claim that multimedia content significantly supports vocabulary development.

Additionally, the results are consistent with studies conducted by Nababan & Simanjuntak (2023) and Rahayu Ramadhan Putri et al. (2023), who found that students exposed to video-based instruction outperformed those receiving traditional instruction. These studies similarly adopted quasi-treatment designs and concluded that the combination of visual, auditory, and contextual features found in video media leads to better vocabulary acquisition. The consistency between previous findings and the current study provides strong evidence that YouTube-based brainstorming is an effective strategy in vocabulary instruction.

The success of the brainstorming process was further enhanced by the format of the lessons, which encouraged students to participate actively, think critically, and express ideas based on the video content. This student-centered approach is supported by Fitriah et al. (2022), who argue that brainstorming

techniques create a meaningful, interactive learning environment where learners feel more confident and engaged. Therefore, the use of YouTube videos as brainstorming media not only improves vocabulary mastery but also promotes higher-order thinking skills.

2. Comparations The Vocabulary Skills Of Students Before And After The Implementation Of The Brainstorming Technique Through English YouTube Videos

Furthermore, to comparing the paired samples t-test performed within the treatment group revealed a statistically significant increase in vocabulary scores from pre-test to post-test ($t(14) = -7.036, p = 0.000$). This shows that the utilization of YouTube videos had a direct impact on students' vocabulary development over the course of the treatment.

This result can be interpreted through the lens of Paivio (2006) Dual Coding Theory, which states that information processed through both verbal and non-verbal (visual) channels is more effectively retained and recalled. The combination of spoken language and visual scenes in YouTube videos allowed students to process vocabulary in multiple ways, thus deepening their understanding and long-term retention. Students were not only hearing the words but also seeing them applied in realistic contexts, which is crucial in language acquisition.

Furthermore, Krashen (1982) reinforces this outcome by asserting that language learning occurs when learners are exposed to comprehensible input slightly above their current level ($i + 1$). The YouTube content provided in this study met this criterion by offering accessible yet challenging vocabulary embedded in natural communication. The comprehensible input presented through video allowed learners to infer meaning, guess word usage, and connect language with context all of which contribute to vocabulary acquisition.

The students' improvement also reflects the effectiveness of the learning design in promoting active engagement. The brainstorming sessions following the video viewing created opportunities for collaborative learning, peer discussion, and reflection, which further consolidated vocabulary learning. This interactive approach is supported by Brown (2004), who emphasizes the importance of learner-centered environments and communicative activities in successful language learning.

Taken together, these findings confirm that YouTube videos, when utilized as brainstorming media, can significantly enhance vocabulary mastery among EFL learners. The effectiveness lies not only in the media itself but in how it is integrated into a broader pedagogical framework that encourages active learning, critical thinking, and contextual understanding. Thus, the study contributes to the growing body of evidence supporting the use of digital media in language education, particularly in vocabulary instruction at the secondary

school level. This progression in vocabulary achievement reaffirms the central hypothesis of this study, illustrating that the YouTube-based brainstorming technique is not only innovative but also pedagogically sound for vocabulary development in junior high school settings.

3. Implication of The Study

The study's findings, which showed a statistically significant improvement in students' vocabulary knowledge after using YouTube videos as brainstorming media, have important implications for English teaching and learning, particularly at the junior high school level.

From a theoretical standpoint, this study reinforces the significance of vocabulary as a fundamental aspect of language acquisition. As stated in the literature review, vocabulary is essential for acquiring the four English language skills of listening, speaking, reading, and writing, and its growth promotes efficient communication and language understanding. The improvement seen in this study supports the idea that intentional vocabulary instruction especially when supported by rich, contextual media like YouTube can enhance both receptive and productive vocabulary knowledge, which were also highlighted in the theoretical framework.

The results give empirical evidence for the application of the Common European Framework of Reference (CEFR) as a guideline for vocabulary level

progression. The improvement in students' scores suggests a movement toward higher vocabulary proficiency levels, as described in the CEFR, which includes increasing ability in comprehension, usage, and application of vocabulary in both oral and written forms.

From the perspective of media in language learning, the study validates the role of YouTube as an effective and engaging instructional tool. Based on the analysis in Chapter II, YouTube provides accessible, visual, and auditory stimuli that help students understand vocabulary in authentic contexts. The audiovisual nature of the platform allows learners to see the application of words in real-world situations, which improves memory retention and motivates participation. Additionally, the success of the intervention supports the use of the brainstorming technique, as theorized by Osborn and described in research by Pakiding (2022) and Fitriah et al. (2022). Brainstorming allows students to activate background knowledge, explore creative ideas, and engage actively with the learning process without the fear of criticism. In this study, YouTube videos acted as effective stimuli to initiate brainstorming, enabling students to generate vocabulary and ideas more freely.

From a pedagogical perspective, this study encourages English teachers to integrate multimedia and pre-learning activities like brainstorming into their classroom practice. Teachers can adopt YouTube videos not just as supplementary tools, but as core instructional media that prompt active

learning, facilitate collaborative discussions, and support vocabulary development across different levels. This integration also aligns with the role of teachers as facilitators and students as content users in a digitally connected learning ecosystem.

Finally, for future researchers, the study offers a model for combining traditional vocabulary assessment with digital media in a quasi-experimental design. Future studies may explore different video genres, other language skills, or the use of YouTube in blended or flipped classroom environments.

In conclusion, this study has meaningful implications for vocabulary instruction by validating the role of YouTube videos and brainstorming techniques grounded in existing theoretical frameworks. It bridges theory and practice, showing how strategic media integration can support vocabulary acquisition and enhance students' learning experiences in modern EFL classrooms.