

CHAPTER IV

RESEARCH FINDINGS AND DISCUSSION

This chapter represents the finding and discussion of the research. This chapter consists of descriptive data, normality and homogeneity testing, hypothesis testing and discussion.

A. Research Findings

1. Descriptive Data

The researchers present the descriptive statistics of the study. Students' vocabulary mastery results in the pre-test and post-test were divided into VII A as an experimental group of 26 students and VII B as a control group of 25 students. Students who are taught using the Duolingo application served as the experimental class, and students who are taught without the Duolingo application served as the control class. This study aimed to discover the effectiveness of using the Duolingo application to improve students' vocabulary mastery at MTS Subulussalam Sriwangi Grade VII.

The researcher administered pre-test before giving the treatment then administered post-test after giving the treatment for both experimental and control groups. To simplify the evaluation process, the researcher has already defined five criteria which could draw on the table below:

Table 4.1 The score's criteria

Score	Criteria
85-100	Excellent
75-84	Very Good
60-74	Good
40-59	Poor
0-39	Fail

Supported on the table 4.1 above, There are 5 scores criteria consist of excellent, very good, good, poor, and fail. The one were categorized as being excellent students who got 85 to 100 as their scores. The category was called very good when the students got between 75 and 84 score. The students who were categorized as good got 60-74 as their score. The students would be categorized as poor when the score was between 40 and 59. The last, students were categorized as failed when the score was between 0-39

a. The Data Of Experimental Class

1. Pre-test of experimental group

A class who were taught using Duolingo application as treatment is mentioned as Experimental group. Pre-test was administered Before giving the treatment for experimental group.

Table 4.2 The pre-test score of experimental group

NO	Name	Pre-test
1	ALN	70
2	BS	60
3	DFW	60
4	DA	50
5	DAP	75
6	DK	85
7	NSA	65

8	NDA	75
9	NSA	80
10	PIR	65
11	PWA	70
12	RN	75
13	RT	85
14	RFD	50
15	SNA	70
16	SDR	80
17	TND	45
18	TSN	55
19	WA	60
20	ZVL	65
21	RA	85
22	RS	55
23	RFD	70
24	MP	60
25	MSS	65
26	NS	60

26 students from the experimental class (Class VII A) took the pre-test. The time allocation for pre-testing is around 60 minutes. The pre-test took place on Saturday, June 8, 2021. The researchers used SPSS version 26.0 for descriptive statistics and percentages of students' pretest scores. The five criteria Excellent, Very Good, Good, Poor and Failed become the percentage (Table 4.1). The following is the data results:

Table 4.3 Descriptive statistics of pre-test of experimental group

Descriptive Statistics						
	N	Minimum	Maximum	Sum	Mean	Std. Deviation
PreTestEXP	26	45	85	1735	66.73	11.220
Valid N (listwise)	26					

Displayed on Table 4.3 above, the table displayed that 45 as the lowest and 85 as the highest score of pretest of experimental class, 68.73 was the mean of the score, the standard deviations showed 11.220, and the sum of data showed 1735. The pretest frequency distribution result of 26 students in experimental class could be seen on the following table:

Table 4.4 The pre-test Frequency Distribution Score

Pre-test Experimental					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	45	1	3.8	3.8	3.8
	50	2	7.7	7.7	11.5
	55	2	7.7	7.7	19.2
	60	5	19.2	19.2	38.5
	65	4	15.4	15.4	53.8
	70	4	15.4	15.4	69.2
	75	3	11.5	11.5	80.8
	80	2	7.7	7.7	88.5
	85	3	11.5	11.5	100.0
	Total	26	100.0	100.0	

Supported on table 4.4 above, it could be viewed that no students' got the pretest frequency score between 0 and 39 from experimental class. There were only 1 student got the score between 40 and 59 mean their vocabulary mastery achievement was poor. While, 13 students got the score between 60 and 74 were achieved a good vocabulary mastery. Students whose score between 75-84 were categorized as good vocabulary mastery score. In addition, there were 3 students which score was between 85-100 that indicated as excellent score.

2. Post-test of experimental group

The researcher administered post test score as the information of knowing the effect of students' vocabulary mastery improvement as treatment activity for experimental group.

Table 4.5 The post test scores of experimental group

NO	Name	Post-test
1	ALN	80
2	BS	75
3	DFW	70
4	DA	60
5	DAP	85
6	DK	90
7	NSA	75
8	NDA	95
9	NSA	95
10	PIR	75
11	PWA	85
12	RN	80
13	RT	90
14	RFD	75
15	SNA	75
16	SDR	85
17	TND	65
18	TSN	70
19	WA	80
20	ZVL	70
21	RA	90
22	RS	75
23	RFD	80
24	MP	75
25	MSS	75
26	NS	70

The post test of experimental group was held on 13th of June 2021 with 60 minutes as time allocation. The post test participants were the

same participants as pre-test. The test was designed as students' vocabulary mastery measurement after the students completed the treatment process with the Duolingo application. The researcher used version 26 of SPSS to find out the statistical descriptive of points received by students after passing the test. The five percentage criteria was divided into excellent, very good, good, poor and unsatisfactory (Table 4.1). The following is The data result:

Table 4.6 Descriptive statistics of post-test of experimental group

Descriptive Statistics						
	N	Minimum	Maximum	Sum	Mean	Std. Deviation
PostTestEXP	26	60	95	2040	78.46	8.918
Valid N (listwise)	26					

Showed on Table 4.6 above, the table showed that 60 become the lowest and 95 was the highest score of post-test of experimental, 78.46 indicated the mean of the score, 8.918 was accumulated as the standard deviations, and the sum of data was seen 2040. Next, the post-test frequency of 26 students in experimental class as follow:

Table 4.7 The post-test Frequency Distribution Score

Post-Test Experimental					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	60	1	3.8	3.8	3.8
	65	1	3.8	3.8	7.7
	70	4	15.4	15.4	23.1
	75	8	30.8	30.8	53.8
	80	4	15.4	15.4	69.2
	85	3	11.5	11.5	80.8

	90	3	11.5	11.5	92.3
	95	2	7.7	7.7	100.0
	Total	26	100.0	100.0	

According to table 4.7 above, it could be viewed that 6 students got score between 60 and 74 achieved a good vocabulary mastery. 12 students got very good vocabulary mastery score between 75-84. In addition, there were 8 students which score was between 85-100 that indicated as excellent score. Besides there was no student gained poor and fail criteria.

b. The Data Of Control Class

1. Pre-test of control class

Controlled group is a class which was taught without using Duolingo application as treatment or in conventional strategy as usual. The researcher administered pre-test for control class before doing teaching learning process.

Table 4.8 The Pre-test Scores of Controlled Class

No	Name	Pre-test
1	AS	55
2	AM	45
3	CAZ	70
4	E	65
5	IA	60
6	IAS	50
7	JA	60
8	JNV	75
9	KNH	70
10	KS	65
11	LF	70
12	LU	65

13	MM	60
14	MSA	40
15	NO	65
16	NR	55
17	SLS	65
18	SNR	60
19	UMS	75
20	UN	55
21	ZAN	60
22	DAT	65
23	MDN	80
24	AF	50
25	ASS	60

The pre-test followed by 25 students of experimental class (VII B Class). The time allocation for doing the pre-test was about 60 minutes. The pre-test was held on Saturday, 8th of June 2021. Excellent, very good, good, poor and fail were the percentage criteria (Table 4.1). The data result of descriptive statistics and the percentage shows as follow:

Table 4.9 The Descriptive statistics of Pre-test of Control Class

Descriptive Statistics						
	N	Minimum	Maximum	Sum	Mean	Std. Deviation
PreTestControlled	25	40	80	1540	61.60	9.434
Valid N (listwise)	25					

According to Table 4.9 above, the table displayed that 40 was the lowest and 80 was the highest score of post-test of control class, the mean of the score displayed 61.60, the standard deviations indicated 9.434, and the sum of data was 1540. Next, the post-test frequency of 25 students in control class as follow:

Table 4.10 Frequency Distribution Of Pre-test Score

Pre-Test Control					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	40	1	4.0	4.0	4.0
	45	1	4.0	4.0	8.0
	50	2	8.0	8.0	16.0
	55	3	12.0	12.0	28.0
	60	6	24.0	24.0	52.0
	65	6	24.0	24.0	76.0
	70	3	12.0	12.0	88.0
	75	2	8.0	8.0	96.0
	80	1	4.0	4.0	100.0
	Total	25	100.0	100.0	

According to table 4.10 above, it could be seen that 7 students found in poor criteria because their score was between 40-59. 6 students got score between 60 and 74 which achieved a good vocabulary mastery. 3 students whose vocabulary mastery score between 75-84 was very good. Meanwhile, there was no student which score between 85-100 was indicated as an excellent score.

2. Post-test of control class

To know the effect of students' vocabulary mastery improvement of controlled group which was taught without using Dulingo application, the researcher administered post test to get the score.

Table 4.11 The Post-test Scores of Control Class

No	Name	Post-test
1	AS	60
2	AM	55
3	CAZ	80
4	E	70
5	IA	65
6	IAS	60
7	JA	75
8	JNV	90
9	KNH	80
10	KS	75
11	LF	80
12	LU	70
13	MM	75
14	MSA	55
15	NO	75
16	NR	65
17	SLS	75
18	SNR	70
19	UMS	80
20	UN	70
21	ZAN	80
22	DAT	70
23	MDN	85
24	AF	65
25	ASS	70

The post test of controlled group was held on 17th of June 2020 with 60 minutes as time allocation. The post test was followed by the same participants as pre-test in control class. The test was intended to know the students' vocabulary mastery after the students taught without using Duolingo application. There were five criterias: excellent, very good, good, poor and fail as the percentage (Table 4.1). The data result shows as follow:

Table 4.12 The Descriptive statistics of Post-test of Control Class

Descriptive Statistics						
	N	Minimum	Maximum	Sum	Mean	Std. Deviation
PostTestControlled	25	55	90	1795	71.80	8.884
Valid N (listwise)	25					

Displayed on Table 4.12, the table showed that 55 as the lowest and 90 as the highest score of post-test of experimental class, the mean score indicated 71.80, the standard deviations showed 8.884, and the sum data referred 1795. The post-test frequency of 25 students in Controlled class as follows:

Table 4.13 Frequency Distribution Of Post-test Score

Post-Test Controlled					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	55	2	8.0	8.0	8.0
	60	2	8.0	8.0	16.0
	65	3	12.0	12.0	28.0
	70	6	24.0	24.0	52.0
	75	5	20.0	20.0	72.0
	80	5	20.0	20.0	92.0
	85	1	4.0	4.0	96.0
	90	1	4.0	4.0	100.0
	Total	25	100.0	100.0	

According to table 4.13 above, it could be said that only 1 student was in poor criteria which the score was between 40-59. Then, 11 students score was between 60 and 74 achieved a good vocabulary

mastery. 5 students in score between 75-84 was very good. In addition, there were only 2 students which score between 85-100 was indicated as excellent score.

2. Normality , Homogeneity Testing And T-test

a. Normality Testing

The data have to be normally distributed is One of the requirement for using a parametric test. There are two formulas which can be done to test the normality of the data using *saphiro-wilk and liliefors (Kolmogorof-smirnov)* in SPSS. In this research, liliffors (Kolmogorof-smirnov) formula was used in testing the normality of the data through SPSS 26. The result of the normality testing for pre-test and post-test in both experimental and controlled group can be seen in the following table:

Table 4.14 Normality Testing

Liliefors (Kolmogorof-Smirnov)

Tests of Normality							
	Group	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	Df	Sig.	Statistic	df	Sig.
Experi ental	1.Pre-test	.102	26	.200*	.963	26	.443
	2.Post-test	.154	26	.115	.964	26	.472
Control	3.Pre-test	.153	25	.136	.971	25	.670
	4.Post-test	.140	25	.200*	.963	25	.473
*. This is a lower bound of the true significance.							
a. Lilliefors Significance Correction							

Showed on the table 4.14, it can be said that the significance data on the table *Liliefors (Kolmogorof-Smirnov)* above interpreted that the data from experimental class pre-test was 0.200 then 0.115 showed the post-

test. It may infer both pre-test and post-test were normally distributed due to the significance was shown higher than $\alpha = 0.05$ (5%). Besides, the significance data from pre-test in control class was 0.136 while the post-test in control class was 0.200. It concludes that the pre-test and post-test in control class were normally distributed because they already fulfilled the criteria of normality testing statement.

b. Homogeneity Testing

The next step should be done in using parametric test is to identify whether the data is homogenous or not generally it is called as homogeneity testing. The researcher used SPSS 26 in testing the homogeneity of the data with *Levene Statistics* formula. The data is described homogenous when the significance of mean calculation result is higher than $\alpha = 0.05$. The result shows on table below:

Table 4.15 Homogeneity Testing

Test of Homogeneity of Variances					
		Levene Statistic	df1	df2	Sig.
Hasil	Based on Mean	.900	3	98	.444
	Based on Median	.762	3	98	.518
	Based on Median and with adjusted df	.762	3	95.245	.518
	Based on trimmed mean	.906	3	98	.441

Relied on the table 4.5 above, it displayed 0.444 as the significance of the data between experimental and control class post-test. Thus, the data of

post-test was homogeneous because it was higher than $\alpha = 0.05$ ($0.444 > 0.05$).

c. T-test

After measuring the normality and homogeneity testing, t-test is used to measure the significant differences between students' vocabulary mastery in experimental and control classes. To answer the research question, the researcher used t-test calculation result using SPSS 26 to identify whether or not Duolingo application is an effective way in students' vocabulary mastery improvement. The recapitulation of t-test calculation can be seen as follow:

Table 4.16 The Output of Group Statistics

Group Statistics					
	Kelas	N	Mean	Std. Deviation	Std. Error Mean
Hasil	EXPERIMENTAL CLASS	26	78.65	9.226	1.809
	CONTROL CLASS	25	71.80	8.884	1.777

Displayed on the table 4.16, it shows the result of group statistics from post-test in experimental and control class. It displayed that the mean from experimental class is 78.65 while from control class is 71.80 which found the significant difference between the mean score between the experimental and control class. The standard deviation from both two classes also found difference score where the experimental class is 9.226 and the control class is 8.884. Meanwhile, the standard error of mean from the experimental class

was higher than the control class which experimental class showed 1.809 and 1.777 for control class.

Table 4.17 The Output 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	
									Lower	Upper
Hasil	Equal variances assumed	.087	.769	2.701	49	.009	6.854	2.538	1.754	11.954
	Equal variances not assumed			2.703	49.000	.009	6.854	2.536	1.758	11.950

Based on the table 4.17, The independent sample test data showed that the result of $t (df = 49) = 2.701$ and p-value or sig (2-tailed) is 0.009. The researcher uses $\alpha = 0.05$ (5%) as the significant standard, therefore in chapter 3 have been explained that the null hypothesis (H_0) is rejected since the p-value or sig (2-tailed) is higher than $\alpha = 0.05$ (5%) and the alternative hypothesis (H_a) is accepted since the p-value or sig (2-tailed) is lower than $\alpha = 0.05$ (5%). Therefore, it proved that the p-value or sig (2-tailed) is

calculated 0.009 which is lower than $\alpha = 0.05$ (5%). It means that the using Duolingo application is effective to increase students' vocabulary mastery.

3. Hypothesis Testing

In order to response the research question which was determined in chapter 1: *“Is there any significant difference score between vocabulary mastery of students who are taught by using Duolingo and vocabulary mastery of students who are taught without using Duolingo?”*, The statistical hypothesis is explained as follows:

- a. (Ha): There is a significant effect of using Duolingo application to increase students' vocabulary mastery.
- b. (Ho): There is no significant effect of using Duolingo application to increase students' vocabulary mastery.

From those explanation which correlate to this research required the assumption of the statistical hypothesis:

- a. If the value of Sig (2-tailed) $> \alpha = 0.05$ (5%). Then, the alternative hypothesis (Ha) is accepted and the null hypothesis (Ho) is rejected. It was stated that the mean scores of the experimental class are higher than the mean scores of the controlled class. So, it means that the use of Duolingo application is effective in students' vocabulary mastery improvement in the seventh grade students of Subulussalam Islamic Junior High School.

b. If the value of Sig (2-tailed) $< \alpha = 0.05$ (5%). Then, the alternative hypothesis (H_a) is rejected and the null hypothesis (H_o) is accepted. It means that the mean scores of the experimental class are the same or lower than the mean scores of the controlled class. So, it indicated that the using of Duolingo application is not effective in improving students' vocabulary mastery in the seventh grade students of MTS Subulussalam Sriwangi.

Based on the t-test accumulation calculation of post-test from the experimental and control class, it could be inferred that the sig (2 tailed) was found 0.009 was lower than significance level of $\alpha = 0.05$ (5%). Therefore, Sig (2-tailed) $> \alpha = 0.05$ (5%) which requires that the alternative hypothesis (H_a) is accepted and the null hypothesis (H_o) is rejected. Thus, it indicates that the using of Duolingo application is effective in improving students' vocabulary mastery in the seventh grade students of MTS Subulussalam Sriwangi.

B. Discussion

This research is aimed to investigate whether Duolingo application is effective for students' vocabulary mastery improvement. This research was done in MTS Subulussalam Sriwangi which is placed in Oku Timur sub district of South Sumatra. The subject of this research consists of 51 students which was separated into experimental and control classes. Pre-test for both experimental and control classes are administered to know the students' earlier vocabulary mastery. Then, the researcher gave the treatment using Duolingo application in learning activity for experimental class while the researcher gave

treatment using conventional learning activity as usual for control class. After providing the treatment, the researcher administered post-test for both classes. To analyze the data of this research used SPSS 26.

Based on the calculation of data findings from the description calculation in previous sub chapter above it could be viewed the difference score between experimental and control class. It proved from the post-test mean result in experimental class was higher than control class. The mean in control class was found 71.80 while the mean in experimental class increased 78.46 after giving the treatment using Duolingo application.

The significance of the data of this research was found normality distributed, it proved from the normality testing used SPSS 26 used *liliefors (kolmogorof-smirnov)* formula. The data presented that the pre- test was 0.200 in experimental class and the control class was 0,136. Meanwhile, the post-test score also showed that the data of *Kolmogorov-Smirnov* in the experimental class is 0.115 and the control class is 0.200. It can be concluded that both of pre-test and post-test scores from both two classes is higher than $\alpha = 0.05$.

Based on the homogeneity testing, it showed that that the significance from post-test between experimental and control class was higher than $\alpha = 0.05$. It could be seen from 0.444 which is higher than $\alpha = 0.05$ ($0.444 > 0.05$). It mean that the data from experimental and control class in post-test was proved as homogeneous data.

In addition, based on independent sample t-test data analysis proved (H_a) is accepted and (H_o) is rejected. It can be seen the statistical significance is shown

by the analyzed post-test data that the result of sig (2-tailed) is 0.009 that is lower than $\alpha = 0.05$ (5%). Therefore, it is proved that the using Duolingo application influenced significant different in students' vocabulary mastery than those taught by using conventional method.

From those data findings, it may be accomplished teaching English using Duolingo application as one of the learning media for seventh grade of MTS Subulussalam Sriwangi is effective. This finding was related to the research that was done by Dina Amalia (2019) entitled "*The Effect of Duolingo Application on the Students's Achievement In Vocabulary*". Relied on result and discussion of the research, it was said that Duolingo application had meaningful effect as learning media in developing students' vocabulary knowledge. As the last conclusion stated that Duolingo application can give a good effect on student' vocabulary mastery because the score of vocabulary test after the researcher doing treatment in experimental class was higher than the score of vocabulary test in controlled class. In addition, Using Duolingo application showed a good effect to be applied for students at the seventh-grade students of MTS Subulussalam Sriwangi.