CHAPTER IV

FINDINGS AND DISCUSSION

This chapter presents the results of the research and discussion. The findings of this study include finding out whether the Duolingo application is significant on the English vocabulary mastery of seventh-grade students at SMPN 3 Candi and describing the students' perceptions of the effect of Duolingo application on the English vocabulary mastery of students at SMPN 3 Candi.

4.1 Findings

The study findings describe the outcomes of data analysis. The vocabulary assessment comprises a pre-test and a post-test. The student's vocabulary was assessed with a pre-test before receiving treatment or a media-based vocabulary presentation. Following the administration of the treatment, a post-test was conducted to determine whether the students' vocabulary had increased. The results of the pre-test and post-test indicated that the vocabulary had grown. After completing the pre-test and post-test, researchers determine whether the media is effective if the post-test score is significant than the pre-test score.

Table 4.1 List of Name of the Students VII SMPN 3 Candi

NO	SAMPLE	CODE
1	ANASTASYA NAILA NURFADILAH	S-1
2	FARISAH NUR HIDAYATI	S-2
3	MUHAMMAD FEBRIANTERAH	S-3
4	RYO HERDIANSYAH	S-4
5	CHRISNA DIPAYANA	S-5
6	DWI RAHMAT UBAIDDILLAH	S-6
7	INAYAH NOVELIA PUTRI	S-7
8	RAKA BRAMANA PUTRA PRATAMA	S-8
9	YUDHA TRI NUR WICAKSANA	S-9
10	AKIFAH AZZALEEA PUTRI	S-10
11	LULUK MUTIARA WAQIDAH	S-11
12	MUHAMMAD ANDIKA LATIF	S-12
13	MUHAMMAD SULTAN FAIZ	S-13
14	DENDRA NARARYA PUTRA	S-14
15	ILHAM KAUTSAR DARMAWAN	S-15
16	MOHAMMAD BOVY ALDIANO	S-16
17	NURIL AYU FADRIYAH	S-17
18	VINKA ALICIA DEVI	S-18
19	DIVA AULIA RAMADHANI	S-19
20	KUSMATUN KHASANAH	S-20
21	MOHAMAD RAFLY MUHTADIN	S-21
22	PUNTA DEWA	S-22
23	ALAIK FARHAN ABADAN	S-23
24	FARIS ZAKY AL NUR RADHI	S-24
25	INDRA RAMADANI	S-25
26	NADIYAH FAHMA FARADILAH	S-26
27	WULAN DURARUL IFFAH MUNTATSIRAH	S-27
28	ARINI CITRA ANDINI	S-28
29	KEYZA ARLINDHITA MAURA	S-29
30	MUHAMMAD IBRAHIM FATHURROHMAN	S-30
31	SLASH ANDRA VIDIYANTO	S-31
32	ARJUN SHEVA AKBAR SAPUTRA	S-32
33	FATIMATUZZAHRO	S-33
34	STENDYTO CHARLY PANDHU +	S-34
35	STELLA MARIA POERNOMO +	S-35
36	VABIANO PETRUS PARLINGGOMAN NAPITUPULU +	S-36

The students were given a pre-test (see the Material exercise of the pre-test on Appendix A. no. 1). The students' score results can be seen in the following Table no. 4.2.

Table 4.2 Scoring the Student's Correct Answer Pre-Test

CODE	PRE-TEST
S-1	50
S-2	57
S-3	43
S-4	33
S-5	40
S-6	43
S-7	50
S-8	60
S-9	40
S-10	50
S-11	53
S-12	67
S-13	60
S-14	47
S-15	57
S-16	63
S-17	63
S-18	60
S-19	63
S-20	53
S-21	60
S-22	53
S-23	33
S-24	43
S-25	50
S-26	50
S-27	60
S-28	67
S-29	40
S-30	60
S-31	67
S-32	47
S-33	53
S-34	60
S-35	47
S-36	60
MEAN	52.83

The table above shows the students' vocabulary scores on the pre-test questions. The minimum pre-test score was 33 and the maximum score was 63. The mean value found was 52.83. After administering the pre-test, treatment was administered to the student participants by the researcher. The intervention took place over two sessions.

The researcher provided a comprehensive overview of the Duolingo Application during the initial encounter. The teacher started the lesson by explaining that the topic would be about daily activities. The teacher and students had a light discussion about their daily activities, such as waking up, having breakfast, going to school, and others. After the discussion, the teacher gave instructions regarding the use of the Duolingo application as a learning medium. The teacher showed and introduced the Duolingo application on a smartphone to the students, explaining its benefits and how to use it.

The steps taken by the teacher were: First, Downloading the Application: The teacher asked the students to download the Duolingo application on their smartphones. For students who did not have smartphones, they were paired with other students who had smartphones. Second, Registering Accounts: The teacher instructed the students to register their accounts on the Duolingo application. This registration process involved creating a username, filling in personal data, and setting the language they wanted to learn. Third**,** Asking About the Application Usage: The teacher opened a Q&A session, allowing the students to ask questions about things they did not understand regarding the use of the Duolingo application. The teacher provided explanations and helped

students who encountered difficulties. Fourth, Opening Unit 1: After all students successfully registered and understood how to use the application, the teacher helped the students open Unit 1 so they could start learning lesson Verb 1 part 1. Fifth, Learning Verb 1 Part 1: The students then opened lesson Verb 1 part 1 and started learning. The teacher directed the students to focus on some vocabulary found in that lesson. Sixth, Writing Vocabulary: The students were asked to write down some vocabulary from Verb 1 part 1 along with their meanings. This activity aimed to strengthen the student's understanding of basic verbs in the language being learned. Through these steps, the teacher helped the students utilize technology in language learning while ensuring all students were actively involved and understood the material being taught.

Subsequently, during the second session, The steps taken by the teacher were: First, The teacher reviewed the previously learned lesson material. Second, The teacher showed and explained the material about daily activities. Third, The students took notes on the material about daily activities. Fourth, The teacher guided the students to actively ask questions about the given material. Fifth, The teacher displayed some vocabulary from Verb 1 in Duolingo. Sixth, The teacher invited the students to translate some words in Duolingo. Seventh, The teacher divided the students into several groups. Eighth, The teacher encouraged the students to complete some exercises available in Duolingo. Ninth,The students then made a sentence about daily activities from the words they learned in Duolingo. Last, The students took turns in front of the class to

present their answers. In addition, teachers also provide content exclusively to verbs within the Duolingo software. This entailed visual analysis of images followed by the learners' auditory repetition of the verbs. During the two sessions, the students were instructed to experiment with a selection of queries presented in the verbs category of the Duolingo Application. With this lesson plan, it was hoped that students could better understand and apply vocabulary related to daily activities in English interactively and enjoyably.

After students were given treatment and training on the Duolinggo Application, students were given a post-test. The student score results were shown in Table 4.3.

Table 4.3 Scoring the Student's Correct Answer Post-Test

CODE	POST-TEST
S-1	87
S-2	90
S-3	93
S-4	90
S-5	90
S-6	87
S-7	90
S-8	90
S-9	90
S-10	93
S-11	83
S-12	87
S-13	90
S-14	87
S-15	93
S-16	87
S-17	87
S-18	90
S-19	87
S-20	90
S-21	87

S-22	87
S-23	90
S-24	90
S-25	83
S-26	87
S-27	90
S-28	83
S-29	90
S-30	87
S-31	93
S-32	93
S-33	87
S-34	83
S-35	90
S-36	90
MEAN	88.64

After administering the treatment, researchers conducted a post-test to assess students' abilities following the treatment with the Duolingo application. Meanwhile, the highest score achieved after the test is 93, the lowest score is 83 and the mean result is 88.64.

Table 4.4. show the comparison score results between students' pre-tests and students' post-tests.

Table 4.4 Compared Scoring the Student's Pre-Test and Post-Test

CODE	PRE-TEST	POST-TEST
S-1	50	87
S-2	57	90
S-3	43	93
S-4	33	90
S-5	40	90
S-6	43	87
S-7	50	90
S-8	60	90
S-9	40	90
S-10	50	93

S-11	53	83
S-12	67	87
S-13	60	90
S-14	47	87
S-15	57	93
S-16	63	87
S-17	63	87
S-18	60	90
S-19	63	87
S-20	53	90
S-21	60	87
S-22	53	87
S-23	33	90
S-24	43	90
S-25	50	83
S-26	50	87
S-27	60	90
S-28	67	83
S-29	40	90
S-30	60	87
S-31	67	93
S-32	47	93
S-33	53	87
S-34	60	83
S-35	47	90
S-36	60	90

4.1.1. The Duolingo application is significant on the English vocabulary mastery of seventh-grade students at SMPN 3 Candi.

4.1.1.1. The frequency and categorization of pre-tests and post-tests.

A description of the findings derived from an analysis of data regarding the impact of the Duolingo app on students' vocabulary improvement. The data was gathered using examination responses provided by 36 students. The researchers administered pre-test and post-test assessments. The investigation spanned the duration of four meetings—materials for the pre-test and post-test on the vocabulary of transitive and intransitive verbs.

Table 4.5 The results scores of the pre-test and post-test Based on Frequency and Percentage

NO	SCORE	CLASSIFICATION	Pre-Test		Post-Test	
			Freq	(%)	Freq	(%)
1	Score 91-100	Very Good	0	0	5	13,9
2	Score 81-90	Good	0	0	31	86,1
3	Score 71-80	Fairly	0	0	0	0
4	Score 61-70	Poor	6	16,7	0	0
5	Score less than 60	Very Poor	30	83,3	0	0
TOTAL			36	100	36	100

The table above shows the growth in students' vocabulary between the pre-test and post-test questions. Thirty students (83.3%) received very poor scores on the pre-test, while six students (16.7%) received poor scores. None of the students who participated in the pre-test achieved a score of very good, good, and fair.

After administering the treatment, researchers conducted a post-test to assess students' abilities following the treatment with the Duolingo application. The post-test results indicate an increase in scores, 5 students received very excellent scores (13.9%), 31 students received good scores (86.1%), and no student has a fairly, poor, or very poor score.

4.1.1.2. The results scores of the Vocabulary Test Using SPSS.

The learning outcomes of seventh-grade students at SMP Negeri 3 Candi were evident from the compared pre-test and post-test scores, as presented in Table 4.1. After that, it was input into the SPSS program. The outcomes of the students' vocabulary learning in this specific case were determined. The table above shows the student outcomes of learning.

Table 4.6 Pre-test and Post-test Learning outcomes at SMPN 3 Candi with SPSS

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PRE_TEST	52.83	36	9.367	1.561
	POST_TEST	88.64	36	2.840	.473

The data presented in the table above indicate that seventh-grade students at SMP Negeri 3 Candi achieve a minimum score of 33 and a maximum score of 63 on the pre-test. The mean value found is 52.83, with a standard deviation of 9,367. Meanwhile, the highest score achieved after the test is 93, and the lowest score is 83. The mean result is 88.64 with a standard deviation of 2,840.

4.1.4.3.Data Analysis using SPSS

4.1.4.3.1. Normality Test

This evaluation is performed before the t-test calculation. The objective is to determine the normality of the data. The author uses the Kolmogorov-Smirnov test. The data follows a normal distribution since the significance level is higher than or equal to 0.05 (5%). The outcome can be characterized as follows:

Table 4.7 Test Normality Using SPSS

One-Sample Kolmogorov-Smirnov Test

		PRE_TEST	POST_TEST
N		36	36
Normal Parameters[a,b]	Mean	52.83	88.64
	Std. Deviation	9.367	2.840
Most Extreme Differences	Absolute	.167	.240

	Positive	.075	.177
	Negative	-.167	-.240
Test Statistic		.167	.240
Asymp. Sig. (2-tailed)		.013[c]	.000[c]

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

The researcher uses the Kolmogorov-Smirnov Test to assess the normality, as shown in the provided table. The data in the Kolmogorov-Smirnov table has a significance of 0.13 in the pre-test and 0.00 in the post-test. The post-test data is not normally distributed, this is indicated by a significance value of less than 0.05.

The solution implemented if the data was not normal was to perform data transformation using the natural logarithm (Ln). Converting data to Ln form was intended to eliminate or minimize violations of normality assumptions and classical regression assumptions. If the data used was not normally distributed or if deviations from classical assumptions occurred, this could be addressed by transforming the data to Ln form.

Table 4.8 Test Normality With Transformation Data Using Ln

One-Sample Kolmogorov-Smirnov Test

		Ln_pre	Ln_post
N		36	36
Normal Parameters[a,b]	Mean	3.9505	4.4841
	Std. Deviation	.18914	.03228
Most Extreme Differences	Absolute	.165	.243
	Positive	.090	.174
	Negative	-.165	-.243
Test Statistic		.165	.243
Asymp. Sig. (2-tailed)		.014[c]	.000[c]

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

The researcher used the Kolmogorov-Smirnov test to assess normality by transforming the data into a natural logarithm (Ln) form, as shown in the available table. The data in the Kolmogorov-Smirnov table had a significance of 0.14 for the pre-test and 0.00 for the post-test. The post-test data was not normally distributed, as indicated by the significance value being less than 0.05.

The researcher had performed data transformation using (Log), but the data was still not normally distributed. The next step the researcher took was to transform the data using logarithm transformation (log10). Logarithm transformation was used when the data did not meet the additive influence assumption. If X was your original data, then X' (X prime) was your transformed data where X' = Log X. Thus, X = X'.

Table 4.9 Test Normality With Transformasi Data Using Log

One-Sample Kolmogorov-Smirnov Test

		Lg10_pre	Lg10_post
N		36	36
Normal Parameters[a,b]	Mean	1.7157	1.9474
	Std. Deviation	.08214	.01402
Most Extreme Differences	Absolute	.165	.243
	Positive	.090	.174
	Negative	-.165	-.243
Test Statistic		.165	.243
Asymp. Sig. (2-tailed)		.014[c]	.000[c]

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

The researcher used the Kolmogorov-Smirnov test to assess normality by transforming the data into (Log 10) form, as shown in the available table. The data in the Kolmogorov-Smirnov table had a significance of 0.14 for the pre-test and 0.00 for the post-test. The post-test data was not normally distributed, as indicated by the significance value being less than 0.05.

The researcher had performed data transformation using (Log10), but the data was still not normally distributed. Thus, the final solution was to use non-parametric statistics (Wilcoxon). The Wilcoxon test is often used as an alternative to the paired sample t-test. If the research data does not pass the normality test, it is considered unsuitable for parametric statistical tests, particularly the paired sample t-test. The basis for decision-making used in the Wilcoxon test as a guideline was as follows: If the Asymp.Sig. (2-tailed) value was less than 0.05, then (H1) was accepted. Conversely, if the Asymp.Sig. (2-tailed) value was greater than 0.05, then (H1) was rejected.

Table 4.10 Test Wilcoxon

Test Statistics

	POST_TEST - PRE_TEST
Z	-5.236[b]
Asymp. Sig. (2-tailed)	.000

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

Based on the output from the "Test Statistics" above, it is known that the Asymp.Sig. (2-tailed) value is 0.000. Since the value 0.000 < 0.05, it can be concluded that "(H1) is accepted". This means that there is a difference between the average scores of the Pre-test and Post-test for students learning English vocabulary using the Duolingo application. Therefore, it can be concluded that "the use of the Duolingo application affects the mastery of English vocabulary for seventh-grade students at SMPN 3 Candi". In other words, there is a significant difference in the mastery of English vocabulary for students before using the Duolingo application and after using the Duolingo application.

4.1.4.3.2. Hypothesis Testing

Hypothesis testing serves the purpose of evaluating a hypothetical assumption made by the researcher. The following statement represents the hypothesis established by the researcher beforehand. The statistical analysis used parametric statistics using paired sample t-tests, based on the homogeneity and normality test results. The authors previously established the following hypothesis:

1. Null Hypothesis (H0): There is no difference in the application of Duolingo on the English vocabulary mastery of seventh-grade students at SMPN 3 Candi.
2. Alternative Hypothesis (H1): There is a difference in the application of Duolingo on the English vocabulary mastery of seventh-grade students at SMPN 3 Candi.

Table 4.11 Paired Sample Test

Paired Samples Test

Paired Differences	t	df

					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			Sig. (2-tailed)
Pair 1	PRE_TEST - POST_TEST	-35.806	10.479	1.747	-39.351	-32.260	-20.500	35	.000

The Sig value is obtained from the "Paired Samples Test" output table shown above. If the p-value (2-tailed) is less than 0.05, then the null hypothesis (H0) is rejected and the alternative hypothesis (H1) is accepted. It is undeniable that there is a discernible disparity in the mean scores between the pre-test and post-test outcomes, indicating the efficacy of the "Duolingo Application" in enhancing the English vocabulary of seventh-grade students at SMPN 3 Candi.

4.1.2. The students perceptions of the effect of Duolingo application on the English vocabulary mastery of seventh-grade students.

The researcher uses questionnaires to collect data on the interests of students who are receiving instruction via the Duolingo Application. The questionnaire consists of 10 questions. The researcher administered a closed-ended questionnaire. This may also be expressed in the proportion of students who the Duolingo Application. The data can be seen, as follows:

Table 4.12 Statistic Questionnaire

Statistics

	DAFTAR SISWA	Q_1	Q_2	Q_3	Q_4	Q_5	Q_6	Q_7	Q_8	Q_9	Q_10

N	Valid	36	36	36	36	36	36	36	36	36	36	36
	Missing	0	0	0	0	0	0	0	0	0	0	0

Table 4.13 The students like to use the Duolingo application to improve vocabulary learning.

Q_1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree (S)	5	13.9	13.9	13.9
	Strongly Agree (SS)	31	86.1	86.1	100.0
	Total	36	100.0	100.0	

The data presented in the table indicates that among the students surveyed, 31 individuals (86.1%) expressed strongly agree, while 5 students (13.9%) agree with the statement. “The students like to use the Duolingo Application to improve vocabulary learning”. The data in the table indicates that none of the students provided responses indicating disagreement or strong disagreement.

Table 4.14 The Duolingo application includes elements of gamification that improve the learning experience and make it more enjoyable.

Q_2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree (S)	7	19.4	19.4	19.4
	Strongly Agree (SS)	29	80.6	80.6	100.0
	Total	36	100.0	100.0	

The data presented in the table indicates that among the students surveyed, 29 individuals (80.6%) expressed strongly agree, while 7 students (19.4%) agree with the statement. “The Duolingo application includes elements of gamification that improve the learning experience and make it more enjoyable.” The data in the table indicates that none of the students provided responses indicating disagreement or strong disagreement.

Table 4.15 Learning vocabulary with the Duolingo application proved to be challenging for the students.

Q_3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree (STS)	29	80.6	80.6	80.6
	Disagree (TS)	6	16.7	16.7	97.2
	Undecided (R)	1	2.8	2.8	100.0
	Total	36	100.0	100.0	

The data presented in the table indicates that among the students surveyed regarding the statement " Learning vocabulary with the Duolingo application proved to be challenging for the students," 29 responded "strongly disagree" with the statement (80.6%), 6 responded "Disagree" with the statement (16.7%), and 1 responded "quite undecided" with the statement (2.8%). The table indicates that a larger number of students have a significant disagreement with the assertion.

Table 4.16 The use of the Duolingo application in the classroom is not recommended.

Q_4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree (STS)	31	86.1	86.1	86.1
	Disagree (TS)	5	13.9	13.9	100.0
	Total	36	100.0	100.0	

The data presented in the table indicates that among the students surveyed regarding the statement "The use of the Duolingo application in the classroom is not recommended," 31 respondents "strongly disagree" with the statement (86.1%), and 5 responded "Disagree" with the statement (13.9%). The table indicates that a larger number of students have a significant disagreement with the assertion.

Table 4.17 The Duolingo application improves the memorization of vocabulary by students.

Q_5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Undecided (R)	1	2.8	2.8	2.8
	Agree (S)	5	13.9	13.9	16.7
	Strongly Agree (SS)	30	83.3	83.3	100.0
	Total	36	100.0	100.0	

The data presented in the table indicates that among the students surveyed regarding the statement "The Duolingo application improves the memorization of

vocabulary by students," 30 respondents "strongly agree" with the statement (83.3%), 5 respondents "agree" with the statement (13.9%), and 1 respondent "quite undecided" with the statement (2.8%). The table indicates that a larger number of students have a significant strong agree with the assertion.

Table 4.18 The Duolingo application is accessible at all times and in all locations.

Q_6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree (S)	6	16.7	16.7	16.7
	Strongly Agree (SS)	30	83.3	83.3	100.0
	Total	36	100.0	100.0	

The data presented in the table indicates that among the students surveyed regarding the statement "The Duolingo Application is accessible at all times and in all locations," 30 respondents "strongly agree" with the statement (83.3%), and 6 respondents "agree" with the statement (16.7%). The table indicates that a larger number of students have a significant strongly agree with the assertion.

Table 4.19 The Duolingo application creates boredom among students while they are learning vocabulary.

Q_7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree (STS)	31	86.1	86.1	86.1
	Disagree (TS)	5	13.9	13.9	100.0
	Total	36	100.0	100.0	

The data presented in the table indicates that among the students surveyed regarding the statement "The Duolingo application creates boredom among students while they are learning vocabulary," 31 respondents "strongly disagree" with the statement (86.1%), and 5 respondents "Disagree" with the statement (13.9%). The table indicates that a larger number of students have a significant disagreement with the assertion.

Table 4.20 Students find it easier to finish their homework assignments after using the Duolingo application.

Q_8

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Undecided (R)	1	2.8	2.8	2.8
	Agree (S)	6	16.7	16.7	19.4
	Strongly Agree (SS)	29	80.6	80.6	100.0
	Total	36	100.0	100.0	

The data presented in the table indicates that among the students surveyed regarding the statement "Students find it easier to finish their homework assignments after using the Duolingo application," 29 responded "strongly agree" with the statement (80.6%), 6 responded "agree" with the statement (16.7%), and 1 responded "quit undecided" with the statement (2.8%). The table indicates that a larger number of students have a significant strongly agree with the as sertion.

Table 4.21 The Duolingo application helps students' understanding of the learning material provided by the teacher.

Q_9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Undecided (R)	1	2.8	2.8	2.8
	Agree (S)	5	13.9	13.9	16.7
	Strongly Agree (SS)	30	83.3	83.3	100.0
	Total	36	100.0	100.0	

The data presented in the table indicates that among the students surveyed regarding the statement "The Duolingo application helps students' understanding of the learning material provided by the teacher," 30 responded "strongly agree" with the statement (83.3%), 5 responded "agree" with the statement (13.9%), and 1 responded "quit undecided" with the statement (2.8%). The table indicates that a larger number of students have a significant strongly agree with the assertion.

Table 4.22 The Duolingo application's assessments are extremely difficult to complete.

Q_10

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree (STS)	31	86.1	86.1	86.1
	Disagree (TS)	5	13.9	13.9	100.0
	Total	36	100.0	100.0	

The data presented in the table indicates that among the students surveyed regarding the statement "The Duolingo application's assessments are extremely

difficult to complete," 31 responded "strongly disagree" with the statement (86.1%), and 5 responded "Disagree" with the statement (13.9%). The table indicates that a larger number of students have a significant disagreement with the assertion.

4.2 Discussion

The researcher concluded, based on the findings of the study, that students who received instruction via the Duolingo application achieved higher scores in their English vocabulary learning. The data findings were obtained from a sample of 36 students who participated in both the pre-test and post-test. This is illustrated in Table 4.3, which presents the mean pre-test result of 53 before commencing Duolingo application-based instruction. The mean post-test score subsequently increased to 89 following the implementation of the intervention. Thus, the average score of the students on the post-test was the highest value from the pre-test.

4.2.1 The Duolingo application is significant on the English vocabulary mastery of students.

The research results indicate that there is a notable improvement in students' vocabulary knowledge. Table 4.5 presents the percentage of students who achieved good scores out of 31 after receiving treatment through the Duolingo application. Specifically, the percentage of students who achieved scores below 60 on the pre-test questions is illustrated in the table. Students ' vocabulary increased significantly after using the Duolingo application to study vocabulary.

The enthusiasm of students during the teaching and learning process utilizing the Duolingo Application serves as evidence of this. This is proven by an increase in

the post-test score which was 93 and the lowest score was 83. The average result was 88.64 with a standard deviation of 2.840. Before using Duolingo, the minimum pre-test score was 33 and the maximum score was 63. The mean value found was 52.83 with a standard deviation of 9.367. Because the Duolingo application contains so many fun elements, students are extremely motivated to learn vocabulary and take it very seriously. The Duolingo application's motto is "learning while playing". This increases children's receptiveness to learning English. They actively engage in the learning process by asking questions during the instructional and educational activities facilitated by the Duolingo Application.

According to the "Test Statistics" above, it is known that the Asymp.Sig. (2-tailed) value is 0.000. Since the value 0.000 < 0.05, it can be concluded that "(H1) is accepted". This means that there is a difference between the average scores of the Pre-test and Post-test for students learning English vocabulary using the Duolingo application. Therefore, it can be concluded that "the use of the Duolingo application affects the mastery of English vocabulary for seventh-grade students at SMPN 3 Candi". In other words, there is a significant difference in the mastery of English vocabulary for students before using the Duolingo application and after using the Duolingo application.

According to the "Paired Samples Test" output table, if the Sig. (2-tailed) is 0.000<0.05, H0 is rejected and H1 is approved. It cannot be argued that there is a significant difference in mean scores between the pre-test and post-test learning

outcomes, which means that there is " Duolingo application has an effect on the student's mastery of English vocabulary at seventh-grade students of SMPN 3 Candi".

The Duolingo Application has the potential to enhance students' vocabulary since it offers the flexibility of being accessible at any time and place, and is also user-friendly for instructional purposes. This is proven by the rise in student scores. A study conducted by Megawati (2022) showed that the use of the Duolingo program is an efficacious method for enhancing English vocabulary. The research revealed that students who were instructed in vocabulary using the Duolingo application had superior outcomes compared to those who did not get such instruction. Furthermore, as stated by Munday (2016), Duolingo is a user-friendly application that possesses utility and promise, despite its primary focus not being on communicative competence. However, students can derive enjoyment from it due to its incorporation of diverse elements, including mobile device accessibility, gamification features, and task diversity. The connection between this research and prior research lies in the utilization of the Duolingo Application as an instructional medium, with the researcher drawing upon previous studies as a point of reference. The outcomes of both studies demonstrate the efficacy of employing the Duolingo Application in educational settings, specifically in enhancing students' vocabulary.

4.2.2 The student's perceptions of the effect of Duolingo application on the English vocabulary mastery of students.

The researcher used a questionnaire to collect data on the interests of students who were instructed using the Duolingo program, based on the results of their study.

The researcher administered a closed questionnaire. The questionnaire has 10 questions, with six focusing on the benefits of the Duolingo Application and four addressing its disadvantages. This may also be quantified by the percentage of students using the Duolingo Application.

The data presented in Table 4.13 indicates that among the students surveyed, 31 individuals (86.1%) firmly agreed with the statement "The students like to use the Duolingo application in improve vocabulary learning." Additionally, 5 students (13.9%) responded "quite agree." The statement indicates that students prefer using the Duolingo program as a means of acquiring vocabulary since there is a complete absence of students who disagree or strongly disagree. Then, in Table 4.17, in response to the statement, "The Duolingo application improves the memorization of vocabulary by students," thirty students (83.3%) responded "strongly agree," five students (13.9%) responded "agree," and one student (2.8%) responded, "Undecided". The statement indicates that students can memorize vocabulary with relative ease using the Duolingo application on average. The use of the Duolingo application as a tool for teaching English vocabulary is shown by Munday (2018), who argues that it may stimulate students' interest in the process of learning and teaching vocabulary.

In Table 4.18, the statement "The Duolingo Application is accessible at all times and in all locations" received 6 answers that agreed, representing a proportion of 16.7%. The majority of respondents strongly agreed with this statement, as 30 students, accounting for 83.3% of the total, replied strongly agree. This indicates that students have the flexibility to utilize the Duolingo Application at any time and in any location,

including outside of school, as no student responded to disagree or strongly disagree with this statement. Teachers can effortlessly integrate the Duolingo Application into both indoor and outdoor learning environments, as it is accessible from any location (Munday, 2016). It is a language learning platform that enables learners to study at any location with internet access and on their own time.

The complete responses offered by students after using the Duolingo application are presented in the table above. The mean number of responses from students indicated significant agreement with the statements titled "Advantages of the Duolingo Application" (numbers 1, 2, 5, 6, 8, and 9). Additionally, the mean student response indicates a strong disagreement with statements that list the drawbacks of Duolingo Applications on positions three, four, seven, and ten. Students agree, according to their responses, that the Duolingo application can enhance their vocabulary, particularly in the area of verbs.

From the previous reason, the researcher could conclude that the Duolingo program can have a substantial impact on student's vocabulary proficiency. The Duolingo Application enhances student learning by providing an entertaining experience. It facilitates the acquisition of new vocabulary via the use of captivating visual elements that aid in understanding word meanings. This motivates and engages students in the process of enhancing their vocabulary. Students can also learn vocabulary at any time and in any location, preventing them from becoming tired of the process. This is supported by the fact that the researchers observed improved vocabulary test scores among students who utilized the Duolingo application pre-

treatment compared to those who did not. This implies that using the Duolingo Application demonstrates a beneficial impact when implemented among students, particularly those in the seventh grade at SMP Negeri 3 Candi.