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by Dhea Anggita Putri Ningtyas

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Teaching Vocabulary Using the Duolingo Application in Junior High School

Dhea Anggita Putri Ningtyas¹, Dian Reftyawati²

^{1,2}State Islamic University Raden Intan Lampung, Indonesia

Address: Jl. Lieutenant Colonel H Jl. Endro Suratmin, Sukarama, District. Sukarama, Bandar Lampung City, Lampung 35131

E-mail: dheaanggitapn@gmail.com¹, dianreftyawati@radenintan.ac.id²

Corresponding Author: dheaanggitapn@gmail.com

Abstract. Most students in junior high school, especially seventh grade, had difficulty learning vocabulary. Even though vocabulary was very important for language learning. Duolingo could help with this problem because Duolingo could make students more interested and less bored when studying. The purpose of this research was to find out whether there was an effect of the Duolingo Application in increasing the vocabulary mastery of 7th grade students at SMPN 32 Bandar Lampung in the 2023/2024 academic year. This research methodology used in this research was quasi-experimental design. The population of this research was all 7th grade students of SMP Negeri 32 Bandar Lampung for the 2023/2024 academic year with a total of 180 students. This research sample consisted of two classes, namely class 7B with a total of 34 students as the experimental class, and class 7C with a total of 33 students as the control class. This meant that the total number of samples for this research was 67. The experimental class used Duolingo Application, while the control class used the "When English Rings a Bell" textbook and dictionaries. The sample for this research was determined using a cluster random sampling technique. The treatment was carried out in first meeting. In collecting data, this research used a test instrument in the form of 40 multiple choice questions. Before giving treatment, a pretest was carried out. Then, after the treatment has been carried out, a post test was given. The results showed that there is a significant difference in student scores before and after treatment. This research used hypothesis testing, especially the T-test, to find out whether the Duolingo Application had a significant effect on students' vocabulary scores. And the results show that Sig. (p_{value}) = 0.000 < α = 0.05. So H_a is accepted and H_o is rejected. It can be concluded that there is a significant effect of using the Duolingo Application on increasing the vocabulary mastery of 7th grade students at SMP Negeri 32 Bandar Lampung in the 2023/2024 academic year.

Keywords: Duolingo Application, Quasi-Experimental Design, Vocabulary.

1. INTRODUCTION

Communication is the way we use so that humans understand each other. Communication is more than just verbal or written expression. Communication also associated with tone and feeling, with facial expressions, actions, gestures and reflections on the meaning of these things (Olson, 1955). In communicating, of course, apart from pronunciation and grammar, there is another element that is very important for language acquisition, namely vocabulary. Vocabulary has a meaning as basic knowledge that is very important for students to learn because in learning a language without knowing vocabulary, communication will not run smoothly and there will be no understanding. Alqahtani (2015) stated that vocabulary as one area of knowledge in language, has a major influence on learners in acquiring language. When students learn a foreign language, the most important aspect to learn is vocabulary. If students do not have enough savings in their vocabulary, students will experience difficulties

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*Dhea Anggita Putri Ningtyas, dheaanggitapn@gmail.com

in their understanding of vocabulary. Vocabulary has the same important role in English as listening, speaking, writing and reading. Before learning the four skills, it is recommended to learn vocabulary first. English lessons at school can be regarded as a subject that is quite difficult. Therefore there are still many students who get scores below the average. English lessons also require students to understand texts in English both in written and spoken form. However, there are many problems students face when learning English, namely the lack of vocabulary. Many students learn vocabulary by reading and memorizing it, but they often forget the meaning of the vocabulary. This means that there must be a method that supports motivation and a fun way to make it easier for students to increase vocabulary mastery.

Based on the information obtained from the English teacher at SMPN 32 Bandar Lampung, there were several obstacles that students experienced in learning vocabulary, namely the lack of students' understanding of vocabulary, students easily forgot about the lessons that had been discussed, and students did not easily understand the material so the teacher had to explain over and over.

In this case the teacher has a very important role. Teachers are required to be able to provide learning methods with innovative media so students don't get bored easily and quickly understand lessons because there are still many students who are not interested and confused about English lessons. One way is by using technology. Technology can change the way we teach and learn languages. One technology that can be utilized is using Android-based media in learning activities. The use of this media will later be adjusted to the material to be delivered. With Android-based applications as learning media, the quality of education will increase. There is a lot of content in this Android-based learning application study materials. So that students do not only focus on interesting content but also can better understand the material taught by the teacher.

Nushi and Eqbali (2017) stated that technology has provided new facilities and approaches for teachers to teach. Technology can also stimulate students' interest to challenge their level of intelligence. So technology can have a big impact on education today. Technology itself has advantages and disadvantages in learning a second language. Lai, C and Kritsonis (2006) stated that the advantage of technology in teaching a second language is that it can be used as a practical material for students to experience learning, providing high learning motivation to students, increasing student knowledge and achievement because by using technology students can find out many things. information, improve teaching materials for learning, create more interaction between teachers and students and students and peers, support individual needs, create student independence in finding sources of information, and deepen

global understanding. While the disadvantages is that many students do not understand the benefits of technology. Most students use technology just for fun, like playing games continuously.

Nowadays, technology is developing rapidly and there are many learning applications that can be used as learning media. One of them is Duolingo, a language learning application that can be downloaded via smartphone. Duolingo is an application that learns many languages, one of which is English. By using the Duolingo application, students can learn vocabulary with interesting game features so students don't get bored. Besides vocabulary, Duolingo also has lots of practice activities for students such as reading, writing, speaking, listening and grammar. Based on the explanation above, the purpose of this research is to find out whether there is an effect of the Duolingo application in increasing the vocabulary mastery of 7th grade students of junior high school.

2. THEORETICAL FRAMEWORK

Vocabulary

Goldman, Adler and Kozman (2010) stated that the essential vocabulary as a whole and specifically for reading comprehension is extensively documented. Vocabulary is a basic component of language proficiency. Mastering vocabulary is very important for everyone in learning a language because vocabulary is the basis for someone knows a language. In addition, Achmad (2013) stated that vocabulary is also a communication system that is owned by someone who is regulated from sound or phonology regularly in arranging and syntactically using it to express or to interpret words that occur in communication.

Learning Media in English as a Foreign Language (EFL)

The media is a speaker tool that is used to convey his message to the recipient. According to Pulungan (2021), learning media is anything that is used to send messages and can influence thoughts, attention, feelings and willingness to learn so that they can support the goals and the learning process becomes controlled. Media is also an intermediary or convey messages by the sender to the recipient of the message. By using media, students can more quickly understand the material presented, so that learning objectives can be realized.

Duolingo

Duolingo is a free learning app created by Ahn and Hacker in November 2011. Duolingo has the slogan “Free language education for the world.” Munday (2015) stated that studies have shown that Duolingo has statistically significant improvements in language skills as a result of using the app. According to its website, Duolingo has more than 30 million registered users. Duolingo also offers several languages for English speakers as well as others for non-English speakers. The Duolingo application can be accessed easily and provides multiple languages. Munday also stated that this application can also increase students' level of confidence when learning a new language. So this application is very helpful for those who want to learn a new language. Duolingo has many interesting features that can help students easily. One of them is learning vocabulary. Duolingo provides vocabulary exercises and gives students the opportunity to hone their vocabulary knowledge.

Dictionary Media Concept

According to Sarigul (2016), dictionary is a reference book that contains words from a language arranged alphabetically, equipped with information about forms, pronunciation, function, meaning, etymology, spelling and idiomatic usage. In learning English, especially learning Vocabulary, the dictionary is one of the learning media or methods used by the teacher because the teacher can inform English vocabulary that is quite complete and makes students read a lot of new vocabulary.

3. RESEARCH METHOD

Research Design

This research uses quantitative research to search for data and test results. Practices were tested with experiments to investigate this research. According to Hyland (2002), an experimental approach is often used to observe the behavior of samples under controlled conditions. The experimental design used in this research is a quasi-experimental design. According to Gribbons and Herman (1997), quasi-experimental designs can be used to answer evaluation questions regarding program effectiveness and impact. This research was conducted to find out whether using the Duolingo Application can increase students' vocabulary mastery. This research uses two classes, namely the experimental class and the control class. The experimental class was taught using the Duolingo Application. Meanwhile, the control class did not use the Duolingo Application but instead used books and dictionaries. The instrument used in this research was a multiple choice vocabulary test with 40 questions. The research

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design according to Creswell (2012) can be seen in the table below:

Table 1. Research Design

Select Control Group	Pre-test	No Treatment	Post-test
Select Experimental Group	Pre-test	Experimental Treatment	Post-test

Population, Sample and Data Collection Techniques

1. Population

According to Swarjana (2022), population is all people, groups, or objects whose research results are generalized. The population in this research are the students in the 7th grade of SMP Negeri 32 Bandar Lampung with a total of 180 students.

2. Sample

According to Supardi (1993), a sample is part of a population that has been selected through the sampling method of a research. There are two classes of samples. In this research, sample selection was used cluster random sampling. Because according Singh and Masuku (2011), cluster random sampling is a sampling technique that might be more practical to do when researchers are confused about taking samples because the object under study is wide. Samples are determined by using a bottle filled with paper that has been named from each class, the paper is rolled up into a small shape, then the bottle is shaken to release the paper. The first paper out is the experimental class, while the second paper is the control class. And the results are class 7.B as the experimental class, and class 7.C as the control class. the total sample of this research is 67 students in two classes of 7th grade students at SMP Negeri 32 Bandar Lampung.

Data Collection Techniques

1. Pre-Test

This pre-test is carried out at the beginning of the meeting before starting a learning activity. This test aims to measure the ability of students in mastering their English vocabulary before learning. In this research, pre-test was given to the experimental class and the control class with multiple choice questions.

2. Post-Test

Post-test is done after the whole series of learning is complete. This test is conducted to get results about mastery of student vocabulary after learning activities. The level of the question is the same as the pre-test because these two tests have the same goal of measuring the mastery of student English vocabulary. In this research the

post-test was conducted in experimental classes and control classes after learning is complete.

3. Data Analysis

After all the data has been collected, the data can be analyzed using parametric statistics. In parametric statistics, there are two assumptions that must be met. Fulfillment of the assumptions as follow:

a. Normality Test

The normality test is used to determine whether the data that has been tested is normally distributed or not. This research used SPSS (Statistical Program for Social Science) to test normality. The normality test used are Kolmogorov-Smirnov and Shapiro-Wilk. The normality test hypothesis formula are :

H_0 : The data are normally distributed.

H_a : The data are not normally distributed.

While the criteria for acceptance of the normality test are as follows:

H_0 is accepted if $\text{Sig. } (\rho_{\text{value}}) \geq \alpha = 0.05$

H_a is accepted if $\text{Sig. } (\rho_{\text{value}}) < \alpha = 0.05$

b. Homogeneity Test

The homogeneity test is used to determine whether data is homogeneous or not. This research used SPSS (Statistical Program for Social Science) to test homogeneity. Homogeneity test was carried out using the Levene test. The hypothesis for the homogeneity test is formulated as follows:

H_0 : The variance of the data is homogeneous

H_a : The variance of the data is not homogeneous

While the acceptance criteria for the homogeneity test are as follows:

H_0 is accepted if $\text{Sig. } (\rho_{\text{value}}) \geq \alpha = 0.05$

H_a is accepted if $\text{Sig. } (\rho_{\text{value}}) < \alpha = 0.05$

4. Hypothetical Test

This research uses the Independent Sample T-test using SPSS for hypothesis testing after the assumptions of the normality test and homogeneity test have been fulfilled. The hypothesis are:

H_a : there is a significant effect of the Duolingo application on increasing the vocabulary mastery of 7th grade students of SMPN 32 Bandar Lampung.

H_0 : there is no significant effect of the Duolingo application on increasing the vocabulary mastery of grade 7 students of SMPN 32 Bandar Lampung.

As for the acceptance criteria for hypothesis testing, they are as follows:

H_a is accepted if $\text{Sig. } (p_{\text{value}}) \leq \alpha = 0.05$

H_o is accepted if $\text{Sig. } (p_{\text{value}}) > \alpha = 0.05$

4. FINDING AND DISCUSSION

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This research was conducted in three meetings in each experimental class and control class. Starting from the pre-test and ending with the post-test. Three treatments were also carried out in the experimental class to determine students' vocabulary skills using the Duolingo Application. On Tuesday, January 16th, 2024 pre-test was carried out for the experimental class (VII B) consisting of 34 students and the control class (VII C) consisting of 33 students. The final treatment was completed on Tuesday, January 30th, 2024 with different treatment materials. On the same day, Tuesday, January 30th, 2024 post-test was carried out for the experimental class and control class.

Findings

This research was conducted in class 7th grade of SMP Negeri 32 Bandar Lampung from 16 to 30 January 2024. The aim of this research was to find out whether there was a significant effect of using the Duolingo application on students' vocabulary mastery. Data was taken from tests, namely pre-test and post-test. Then the data was analyzed using SPSS.

Result of The Pre-Test and Post-test in Experimental Class

The pre-test was held on Tuesday, January 16th, 2024 at 08.00-09.30 to determine the vocabulary level of class VII B students before being given treatment. Meanwhile, the post-test was carried out on Tuesday, January 30th, 2024 at 08.00-09.30 to determine the students' vocabulary level after being given treatment. The result of pre-test and post-test can be seen in table 1:

Table 1. Students' Scores of Experimental Class

No	Students	Experimental Class	
		Pre-test	Post-test
1.	S1	60	84
2.	S2	60	77
3.	S3	57	74
4.	S4	64	84
5.	S5	77	94
6.	S6	64	80
7.	S7	60	84
8.	S8	90	100
9.	S9	74	80
10.	S10	77	87
11.	S11	67	84
12.	S12	54	74
13.	S13	70	87
14.	S14	54	77
15.	S15	57	67
16.	S16	54	84
17.	S17	67	74
18.	S18	77	80
19.	S19	54	77
20.	S20	50	64
21.	S21	54	70
22.	S22	67	80
23.	S23	80	97
24.	S24	94	100
25.	S25	47	64
26.	S26	90	97
27.	S27	80	90
28.	S28	64	77
29.	S29	80	97
30.	S30	50	80
31.	S31	57	84
32.	S32	80	94
33.	S33	70	80
34.	S34	67	74
Mean Score		66.94	82.24
Maximum Score		94	100
Minimum Score		44	64

Based on Table 1 above, it can be seen that the scores of the 34 students in the experimental class are different. The mean score of pre-test is 66.94 and the mean score of post-test is 82.24. Then the minimum score of pre-test is 44 and the maximum score is 94. Meanwhile, the minimum score of post-test is 64 and the maximum score is 100.

Result of The Pre-Test and Post-test in Control Class

The pre-test was carried out on Tuesday, January 16th, 2024 at 11.00-12.30 to find out the vocabulary level of class VII C students before being given treatment. Meanwhile, the post-test was carried out on Tuesday, January 30th, 2024 at 11.00-12.30 to determine the students' vocabulary level after being given treatment. The pre-test and post-test results of students in the Control Class can be seen in table 2:

Table 2. Students' Scores of Control Class

No.	Students	Control Class	
		Pre-test	Post-test
1.	S1	37	47
2.	S2	50	64
3.	S3	24	37
4.	S4	54	77
5.	S5	47	64
6.	S6	34	50
7.	S7	34	57
8.	S8	64	80
9.	S9	44	60
10.	S10	30	47
11.	S11	24	60
12.	S12	17	50
13.	S13	47	74
14.	S14	24	54
15.	S15	50	80
16.	S16	37	50
17.	S17	60	74
18.	S18	50	77
19.	S19	60	57
20.	S20	50	74
21.	S21	44	54
22.	S22	67	77
23.	S23	44	64
24.	S24	57	80
25.	S25	47	60
26.	S26	50	57
27.	S27	70	84
28.	S28	40	50
29.	S29	44	60
30.	S30	50	67
31.	S31	40	57
32.	S32	40	54
33.	S33	30	60
Mean Score		62.33	62.33
Maximum Score		84	84
Minimum Score		37	37

Based on Table 2 above, it can be seen that the scores of the 33 students in the control class are different. The mean score of pre-test is 44.24 and the mean score of post-test is 62.33. Then the minimum score of pre-test is 17 and the maximum score is 70. Meanwhile, the minimum score of post-test is 37 and the maximum score is 84.

Result of Normality Test

Table 3. Normality of the Experimental and Control Class

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	Df	Sig.
Pre-test Experimental	.116	34	.200*	.950	34	.127
Post-test Experimental	.139	34	.093	.955	34	.176
Pre-test Control	.115	33	.200*	.980	33	.798
Post-test Control	.146	33	.074	.952	33	.149

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

a. Lilliefors Significance Correction

Based on table 3 above, it can be seen that Sig. (ρ_{value}) for the experimental class was 0.093 for Kolmogorov-Smirnov^a and 0.176 for Shapiro-Wilk. Sig. (ρ_{value}) for the control class was 0.074 for Kolmogorov-Smirnov^a and 0.149 for Shapiro-Wilk. Because Sig. (ρ_{value}) for the experimental class and control class $\geq \alpha = 0.05$, it can be concluded that the residual data score normally distributed.

Result of Homogeneity

Table 4. Homogeneity Test of Experimental Class and Control Class

		Test of Homogeneity of Variances			
		Levene Statistic	df1	df2	Sig.
Result of Students' Score	Based on Mean	2.116	1	65	.151
	Based on Median	1.350	1	65	.250
	Based on Median and with adjusted df	1.350	1	63.800	.250
	Based on trimmed mean	2.141	1	65	.148

Based on table 4 above, it can be seen in the column Levene Statistics that Sig. (ρ_{value}) = 0.148 $\geq \alpha = 0.05$, this is the case shows that H_0 is accepted because Sig. (ρ_{value}) $\geq \alpha = 0.05$. This means that the data variance is homogeneous.

Result of Hypothetical Test

Table 5. Result of Hypothetical Test

Group Statistics					
	Class	N	Mean	Std. Deviation	Std. Error Mean
Result of Students' Score	Eksperimental Class	34	82.2353	9.76096	1.67399
	Control Class	33	62.3333	11.93646	2.07787

Table 5 shows that 34 students from the experimental group and 33 students from the control group were selected as samples. Based on the results in the table above, the experimental and control groups have different average values. The experimental group obtained an average score of 82.2353, and the control group obtained an average score of 62.3333. These results show that the average score between the experimental and control groups is 19.902. From the average score results the experimental group got a higher average score than the control group. The results of the Independent Samples Test can be seen in table 6 below:

Table 6. 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
Result of Students' Score										
	Equal variances assumed	2.116	.151	7.481	65	.000	19.90196	2.66028	14.58902	25.21490
	Equal variances not assumed			7.459	61.782	.000	19.90196	2.66829	14.56774	25.23618

Based on table 6 above, the results of the Independent Sample T-Test show significant results, namely Sig. (p_{value}) = 0.000 $\leq$ α = 0.05. So H_a is accepted and H_o is rejected. Based on these results, it can be concluded that there was a significant influence on the use of the

Duolingo Application to increase vocabulary mastery of 7th grade students at SMPN 32 Bandar Lampung in the academic year 2023/2024.

Discussion

This research was conducted to determine the effect of using the Duolingo Application on increasing vocabulary mastery of the 7th grade students at SMP Negeri 32 Bandar Lampung in the academic year 2023/2024. Previously, students had been given a vocabulary test as an instrument test to collect data. Based on the results of the research, the pre-test results before the treatment was given were low. However, after being given treatment using the Duolingo Application media, students' vocabulary mastery became better. After receiving treatment and being given a post-test, it turned out that there was a significant difference between the experimental class and the control class where the post-test results for the experimental class were higher than the control class. This is proven by the mean pre-test score for the experimental class of 66.94 and post-test of 82.24, while the mean pre-test score for the control class is 44.24 and post-test is 62.33. This means that in the experimental class there was a greater increase in vocabulary mastery compared to the control class.

In the teaching and learning process the experimental class uses the Duolingo application as the media. By using the Duolingo application, students became more active and enthusiastic in learning. This media really helps students improve their vocabulary mastery. It can be seen from the students' scores how the Duolingo application has a positive impact on increasing vocabulary. In contrast to the control class which used books and dictionaries, students looked bored and not active in learning. This is a problem because students have low interest in improving their vocabulary skills. This problem may occur because the media used in learning seems ordinary and less interesting. From the results of this research, it is known that using the Duolingo application as a media is quite effective. This means that choosing the right media is very important in teaching and learning activities. Based on the hypothesis test results obtained, the t-test calculation results show that $\text{Sig. } (\rho_{\text{value}}) = 0.000 \leq \alpha = 0.05$. So H_a is accepted and H_o is rejected. This means that the Duolingo application as a learning media can increase students' vocabulary mastery. This answers the research problem "Is there an effect of using the Duolingo application on students' vocabulary mastery?"

This is supported by previous research as follows:

The first research was conducted by Rifdinal which showed that the Duolingo Application had a significant effect on vocabulary learning. This research uses a Quasi-experimental design which consists of an experimental class and a control class. Test results

homogeneity shows that the sig value. 0.736, higher than 0.05. Independent sample t-test shows that the Equal variances value is assumed to be sig. (2-tailed) is $0.035 < 0.05$ so H_a is accepted and H_o is rejected (Rifdinal, 2021). The reason that supports the results of research conducted by Rifdinal in this research is that the Duolingo Application also has a significant effect on vocabulary learning.

The second research was conducted by Aziz and Hoesny which showed that the Duolingo Application also had an effect on increasing students' vocabulary. This research method uses quasi-experimental design with the number of students in the experimental class being 20 students and the control class being 20 students. The research results show $t(df = 38) = 2.881$ and sig. (2-tailed) = 0.006. Because the sig (2-tailed) 0.006 is less than 0.05, H_a is accepted and H_o is rejected (Aziz and Hoesny, 2022). The reason that supports the results of research conducted by Aziz and Hoesny on this research is that this research also used the Duolingo Application to increase students' vocabulary and it was proven to be significant using the same method, namely quasi-experimental design.

The third research was conducted by Kurniawati, Agustina, and Kuspiyah which showed that the Duolingo Application was significant in increasing students' vocabulary. This research method uses a quasi-experimental design with a total of 27 students for the experimental class and 28 students for the control class. The research results show that the t-obtained value is 13.344 and the t-table value is 2.021. The sig. (2-tailed) level is 0.000 smaller than the 0.05. So H_a of this research is accepted, but H_o is rejected (Kurniawati, Agustina, and Kuspiyah, 2021). The reason that supports the results of research conducted by Kurniawati, Agustina, and Kuspiyah in this research is that the Duolingo Application also has a significant effect on increasing students' vocabulary. By using two classes, namely the experimental class and the control class, there was an increase in scores for the experimental class which used the Duolingo Application.

Based on the explanation above, it can be concluded that using the Duolingo Application is a media that can help students learn new words and improve students' vocabulary mastery. This means that the Duolingo Application has a significant effect as a learning media to improve students' vocabulary mastery.

5. CONCLUSION

Based on the research results, it can be concluded that the Duolingo Application has a significant influence as a learning media in improving students' vocabulary mastery. This is proven by the sig. results (2-tailed) on equal variances assumed in the independent samples t-test where Sig. (p_{value}) = $0.000 \leq \alpha = 0.05$. So H_a is accepted and H_o is rejected. These results show that the Duolingo Application provides benefits for vocabulary learning for 7th grade students at SMP Negeri 32 Bandar Lampung in the academic year 2023/2024.

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