

# The Effect of Duolingo Game as Extramural English Towards Students' Vocabulary Mastery

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## ABSTRACT

This experimental research was carried out in class X at SMA Muhammadiyah Bangkinang Kota. This research aims to determine the effect of duolingo game as extramural English towards students' vocabulary Mastery at SMA Muhammadiyah Bangkinang. The research methodology uses a quasi-experimental design. The sample for this research consisted of 53 students, namely 29 students in class X Science two and 24 students in class X Social. Data collection techniques include tests and documentation. Data were analyzed using SPSS 16. Based on the research results, it can be concluded that Duolingo Game can improve the Vocabulary Mastery of class X Science two students at SMA Muhammadiyah Bangkinang Kota as Extramural English. With an average posttest score of 86,42 and Paired T Test results with a significance level of 5% obtained Sig. (2-tailed) = 0,001 < 0,05 Therefore, it can be seen that  $p < \alpha$ , meaning that  $H_0$  is rejected and  $H_a$  is accepted. This proves that duolingo game has a significant effect on students' ability to improve English vocabulary in tenth grade.

**Keywords:** *Duolingo Game, Extramural English, Vocabulary Mastery*

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## INTRODUCTION

English is essential in many aspects of life, such as technology, such as technology, economics, education and international relations. This is why the Indonesian government has made English a major subject in schools and colleges. English is taught at all levels of education, from elementary school to college (Aulia et al., 2020) learning English means learning language elements and skills. Language components include grammar, vocabulary, pronunciation, and spelling, while language skills include reading, writing, listening, and speaking. (Asilestari, 2016) One very important component of language in speech is vocabulary, which serves to convey the intent of the sender of the message. If a person has sufficient understanding of words, they can convey their feelings and thoughts (Herminingsih, 2021).

Vocabulary is an important component of the four language skills, and the fact that one cannot communicate well if they lack vocabulary shows how important vocabulary is. Vocabulary is also important, according to Lelawati et al. (2018), cited in (Herminingsih, 2021), because it is the basis of linguistic problems and helps students learn the language. (Herminingsih, 2021), argue that vocabulary is crucial as it is at the core of linguistic challenges and acts as a stepping stone for language learners. many students do not have much vocabulary despite the fact that vocabulary is essential for language learning as it is an important part of linguistic issues and serves as a stepping stone for students learning a language. However, the fact that vocabulary is essential for language development, many students still lack vocabulary. Students face many challenges when learning a language. (Nursyamsiah, 2021). Both opinions differ that vocabulary must be mastered first because it is the basis of language learning, both for native speakers and students. However, both agree that vocabulary mastery is very important in language learning, especially for students.

Teachers should look for ways, techniques and resources to help their students learn vocabulary (Fitri et al., 2023).

Based on observations made by researchers at SMA Muhammadiyah Bangkinang Kota, by conducting interviews with English teachers there. The researcher obtained information that students still have limited abilities in learning English so that students find it difficult to communicate well. (Tiara Putri Utomo, 2020) He also said that lack of confidence also affected students' abilities. The researcher also interviewed some students of class X SMA Muhammadiyah Bangkinang Kota and got information that students find it difficult to learn English because of the lack of understanding of English vocabulary. They argued that there should be good techniques and ways to improve English comprehension that if learned is not boring and monotonous. Students also said that they are not interested in learning English because the methods used when learning are very boring. They have their own ideas to learn English by downloading games that have English learning education because almost all of them have a hobby of playing games.

From the problems found, the researcher will try to take an approach by using "duolingo game" as an alternative solution. One of the most effective and fun ways to improve vocabulary acquisition is to do a habit that students often do, namely playing games which according to the researcher can be done during extracurricular English. duolingo games are very useful for second or foreign language learners because they offer many languages that can be learned while serving as a valuable English teaching tool in a natural way. duolingo serves as a means to improve students' vocabulary acquisition even listening, and speaking is also learned. This greatly attracts students' attention, developing their ability to understand English vocabulary.

According to Research conducted by (Rifidinal, 2021) found that Duolingo can help students improve their vocabulary. Students showed significant improvement in their grammar structure and vocabulary before and after using the app. The number of correct answers per student increased by 25 to 40 per cent, according to statistical data. In addition, at the end of the lesson, Ana found that her students had gained oral speaking ability with more confidence. There are several reasons why the researcher chose duolingo game for her research. Firstly, students have always been focused on with duolingo game, students will be motivated to learn English and improve vocabulary mastery better because it has a learning method that is not boring and fun. Secondly, the opportunity to understand vocabulary is increased because they can learn anytime and anywhere. Thirdly, students can get lessons that are not learnt at school anywhere and anytime because it can be played at any time.

Therefore, the researcher uses duolingo game as a medium in the teaching and learning process and hopes that duolingo can motivate students and improve students' vocabulary skills.

The objective of the study is to find out the effect of duolingo game as estramural english towards students' vocabulary mastery.

## METHOD

This research uses a quasi-experimental approach with a quantitative method to examine the effect of the Duolingo app on students' vocabulary mastery. Two classes from tenth-grade students at Senior High School Muhammadiyah Bangkinang were selected: X IPA 2 (Experimental group) and X IPS (Control group), with a total of 54 students. The Experimental group received Duolingo-based instruction, while the Control group was taught using traditional methods.

The study used a vocabulary test for pre-test and post-test to assess students' progress. Data was analyzed using a t-test in SPSS 25.0, along with normality and homogeneity tests to ensure validity and reliability. This research aims to determine whether Duolingo effectively improves vocabulary mastery compared to conventional teaching.

**FINDINGS AND DISCUSSION**

The experimental class consisted of students from X-IPA 2 at SMA Muhammadiyah Bangkinang, totaling 29 students. This class was taught using the Duolingo game as a treatment to enhance their vocabulary skills. Before the treatment, a pre-test was administered to measure the students' initial vocabulary ability. After the treatment was applied through Duolingo sessions, the students were given a post-test to evaluate any improvements. (Nurhasela et al., 2023) The comparison of the pre-test and post-test results allowed the researcher to analyze the impact of the Duolingo game on the students' vocabulary development.

**Pre-test**

The researcher assessed the students' vocabulary skills using a pre-test prior to administering the treatment with the Duolingo game. The purpose of the pre-test was to evaluate the students' vocabulary abilities before the introduction of the Duolingo game. The results of the pre-test are presented in Table 1:

Table 1. Descriptive Statistics of Pre-test in Experimental Class

		pretest
<b>N</b>	<b>valid</b>	29
	<b>missing</b>	0
Mean		64.86
Std. Error of Mean		2.075
Median		67.00
Mode		63 <sup>a</sup>
Std. Deviation		11.176
Variance		124.909
Range		37
Minimum		46
Maximum		83
Sum		1881
Mean		64.86
Std. Error of Mean		2.075

From the Table 1 above, calculated descriptive statistic from 29 students as participant in the classroom. The mean from data above was 64,86, it knowed that students average got score was 1881 as pre-test score. Median 67 and Mode 63. Student pre-test score had minimum and maximum scores, minimum score result was 46. It scores mean in around poor category score and maximum score just got 83. Then standard deviation measure, student score standard deviation was. Moreover, researcher measure

Pretest score in frequency data, it will show at table 4.3 which had detail explanation about pretest score. That presented as follows:

Table 2 Frequency of Pre-Test of Experimental Class

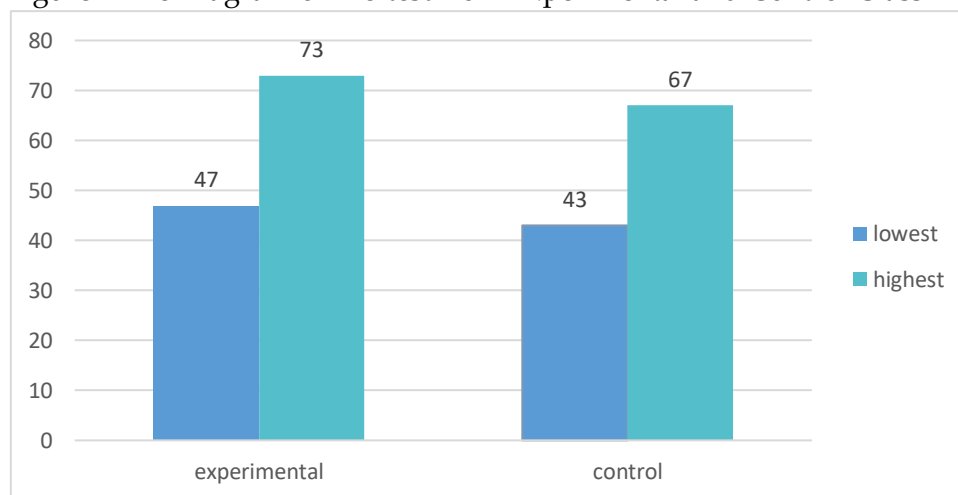
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	46	2	6.9	6.9	6.9
	47	2	6.9	6.9	13.8
	53	1	3.4	3.4	17.2
	54	1	3.4	3.4	20.7
	56	2	6.9	6.9	27.6
	57	1	3.4	3.4	31.0
	62	2	6.9	6.9	37.9
	63	3	10.3	10.3	48.3
	67	3	10.3	10.3	58.6
	70	2	6.9	6.9	65.5

*The Effect of Duolingo Game as Extramural English Towards Students' Vocabulary Mastery*

71	2	6.9	6.9	72.4
72	1	3.4	3.4	75.9
73	1	3.4	3.4	79.3
75	2	6.9	6.9	86.2
81	2	6.9	6.9	93.1
83	2	6.9	6.9	100.0

On the table above, it could see that 1 student get a scoring category of 53,54,57,72, and 73 with a presentation of 3.4%, there were 2 students get a scoring category of 46,47, 56,62,70, and 71 with a 6.9% perspective, there is 3 student who gets a scoring category of 63, and 67, 10.3%.

Figure 1 The Diagram of Pre-test from Experimental and Control Class



Based to the following graphic the pre-test of experimental class had a highest score 87 and a lowest score of 63. The control class results showed that highest score 73. The control class results showed that highest score was 73 and the lowest score was 47

Table 3 Descriptive Statistics of Pre-test in Control Class

Pre_Test	
N	24
	0
Mean	62.96
Std. Error of Mean	1.124
Median	63.50
Mode	68
Std. Deviation	5.505
variance	30.303
range	20
Minimum	50
Maximum	70
Sum	1511

Table 3 calculated descriptive statistic from 24 students as participant in the classroom. The mean from data above was 62,96 Median is 63.50 and Mode 68. Student pre-test score had minimum and maximum scores, minimum score result was 50. It scores mean in around poor category score and maximum score just got 70. Then standard deviation measure, student score standard deviation was 5.505 Moreover researcher measure pretest score in frequency data, it will show at table 4.12 which had detail explanation about pre-test score. That presented as follows:

Table 4 Frequency of Pre-Test of Control Class

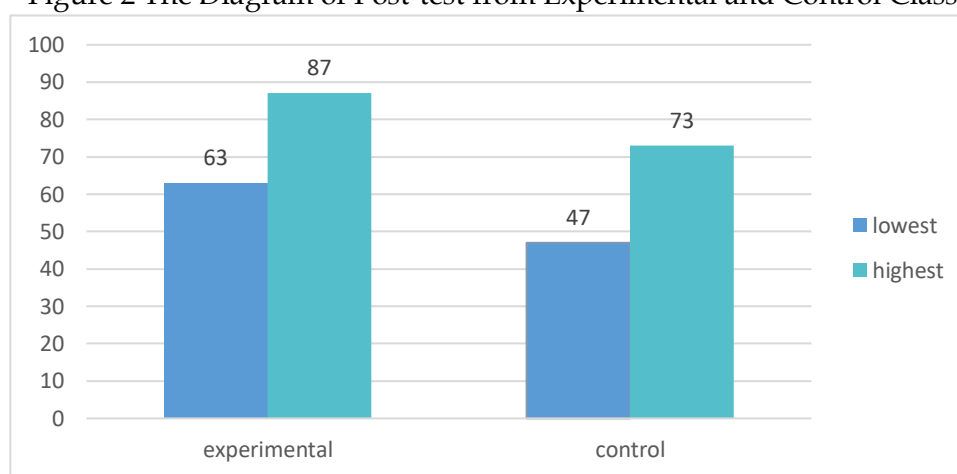
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	50	1	4.2	4.2	4.2
	53	1	4.2	4.2	8.3

*The Effect of Duolingo Game as Extramural English Towards Students' Vocabulary Mastery*

56	2	8.3	8.3	16.7
57	1	4.2	4.2	20.8
60	3	12.5	12.5	33.3
63	4	16.7	16.7	50.0
64	3	12.5	12.5	62.5
67	1	4.2	4.2	66.7
68	6	25.0	25.0	91.7
68	6	25.0	25.0	91.7
70	2	8.3	8.3	100.0
Total	24	100.0	100.0	

As mentioned at the table 4 after data analyzed, it shows pre- test class control Based on the table above, it could see that 1 students get a scoring category of , 50,53,57,and 67 with a presentation of 4,2 %, there were 2 students get a scoring category of 56 and 70 with a 8,3 % perspective, there is 3 student who gets a scoring category of 60 and 64 with a percentage of 12.5%, and there is 6 student who gets a scoring category of 68 with a presentation of 25.0%

Figure 2 The Diagram of Post-test from Experimental and Control Class



Based to the following graphic, the post-test of experimental class's had a highest score of 87 and a lowest score of 63. The control class results showed that highest score was 73 and the lowest score was 47.

Table 5 The Data of Pre-test Scores of Experimental and Control Class

Class	N	Mean	Standard Deviation
Experimental	29	64.86	10.98
Control	24	62.95	5.388

Based on the table above, it could be seen that differences of pre-test scores between control class and experimental class. The mean score was 64.86 and Standard Deviation was 1.098 The control classes the mean score was 62.95 and Standard Deviation was 11.176

### Data Analysis

After administering the pre-test and post-test scores for both the experimental and control classes, the researcher assessed the normality and homogeneity of the data prior to performing the t-test. The results are presented in the following table:

Table 6 Tests of Normality

		Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Class							
Experimental	experiment	.195	9	.01	.941	9	.17
	control	.170	4	.07	.918	4	.05

## a. Lilliefors Significance Correction

From Table 6, it is observed that the normality value for the experimental class is 0.172 with a significance level of 0.05. This indicates that the pre-test data for the experimental class is normally distributed, as the value exceeds the significance level ( $0.172 > 0.05$ ). In contrast, the normality value for the control class is 0.53 with a significance level of 0.05, suggesting that the data for the control class is also normally distributed, since this value is greater than the significance level ( $0.53 > 0.05$ ).

Table 7 Tests of Normality

		Kolmogorov-Smirnova			Shapiro-Wilk		
Class		Statistic	df	Sig.	Statistic	df	Sig.
Hasil Belajar Vocabulary	Pre-Test Experimen (Duo Lingo )	.185	29	.013	.921	29	.033
	Post-Test Experimen (Duo Lingo)	.141	29	.146	.934	29	.072
	Pre-Test Control (deskriptif text)	.146	24	.200*	.960	24	.438
	Post-Test Control (deskriptif text)	.195	24	.019	.948	24	.239



From Table 7, it can be seen that the homogeneity value is 0.33 with a significance level of 0.05. This indicates that the data is homogeneous, as the pre-test value is greater than the significance level ( $0.33 > 0.05$ ). After performing the normality and homogeneity tests, the researcher proceeded to use the t-test for hypothesis testing.

The t-test is used to determine whether there is a significant difference between the mean scores of students in the pre-test and post-test. Utilizing inferential analysis through the t-test, significant differences can be more easily assessed with SPSS version 25.0. In this research, the Null Hypothesis ( $H_0$ ) posits that there is no effect of Duolingo game as Extramural English Towards students' vocabulary mastery Conversely, the Alternative Hypothesis ( $H_a$ ) asserts that there is an effect of Duolingo game as extramural english towards students' vocabulary mastery If the significance value, or sig. (2-tailed), is less than 0.05, then  $H_a$  is accepted and  $H_0$  is rejected.

Table 8 T-Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference		Lower	Upper
ScoreEqual variances assumed	2.204	.143	3.575	56	.001	-7.759	2.170		-12.106	-3.411
Equal variances not assumed			3.575	52.299	.001	-7.759	2.170		-12.113	-3.404

That result from the table above, it showed that the sig. (2-tailed) was 0.001 sig. (2-tailed)  $< 0.05$ . It means that using the Duolingo game was an effective in increasing students' vocabulary mastery ability. The sign.Value for pretest between experimental and control group are 0.001, this value was lower than the significance 0.05 ( $0.000 > 0.05$ ). It means that there was a significant between means of experimental and control group. It means that there was significant between means of experimental and control group.

Then t-value is compared to the t-table to know whether duolingo game problem-based learning in speaking ability. The t-table is taken from the standard for the analysis of the data. The ttable shows 1.681 with 43 as the degree of freedom (df) in the data significance level 0.05. The comparison reveals that tvalue 3.406  $>$  ttable 1.681 and the Sig. (2-tailed) post-test score was lower than  $\alpha$ ,  $0.001 < 0.05$ . Therefore, it can be seen that  $\rho < \alpha$ , it means that  $H_0$  has been rejected and  $H_a$  has been accepted. It proves that the mean score of the experimental class is higher than the control class.

## Discussion

Based on the data analysis above, there is a slight difference in students' vocabulary mastery between the experimental group that received treatment using Duolingo and the control class that did not receive treatment. (Azzahara et al., 2023) The mean of the experimental group pretest was 68 points, while the mean of the control group was 65 points, and the minimum required score was 75 points. This shows that both distributions on the pretest did not meet the minimum standard deviation of the pretest mean.(Permatasari et al., 2022) The post-test score of the experimental group was 86, while the average score of the control group without using Duolingo was 73. This occurred after using Duolingo in class as a treatment. Based on this, the control group did not meet the required standard, while the experimental class met the required standard. In other words, it can be concluded from these scores that the vocabulary acquisition of the experimental class has improved significantly compared to the control class that did not use Duolingo

Briefly, 29 students formed the experimental group and 24 students form the control group.  $(29+24)-2 = 51$  is the degree of freedom (df). With 51 degrees of freedom, a significance level of 5% ( $=0.05$ ), and a critical value of 1.99, the critical value was determined. The results of statistical calculations show that the result of  $t_{count} = 12.57$ , which is higher than  $t_{table} = 1.99$ , was obtained. As a result, the alternative hypothesis ( $H_a$ ) is accepted and the null hypothesis ( $H_o$ ) is rejected. This shows that the use of Duolingo application has a positive impact on the vocabulary mastery of class X students at SMA Muhammadiyah Bangkinang.

After doing all these steps, the researcher found some weaknesses when the research was conducted. The first time when the author entered and started learning by using the Duolingo application treatment, the internet connection speed was very low and it was quite disturbing the time in the learning process. (Aulia et al., 2020) Some students who had higher internet connection speed could do the task faster than others. (Mohamed Khalifa Gawi, 2020) Furthermore, when students do not have data, so the duolingo application cannot open the next level and it affects the learning process in class, but there are students who are kind by providing hotspots to other students who do not have data connections and the class can run well. In addition to the above problems, the author also found the advantages of using duolingo in the classroom learning process, where students can play it easily and enjoy completing the game because the duolingo application is not a difficult game to play, and can also improve listening skills and vocabulary mastery through this application.

## CONCLUSIONS

After conducting this study, the researcher came to a conclusion. First, it is undeniable that Duolingo app can help students in improving their vocabulary. It is evident from the statistics that the post-test average score of 77 is greater than the pretest average score of 63 obtained. Duolingo app helps students who are interested in learning English and participate in the class process. Finally, the t-test result ( $t_{count} > t_{table}$ ) of  $12.57 > 1.99$  supports the alternative hypothesis ( $H_a$ ), which states that the use of Duolingo has a positive impact on vocabulary mastery of grade X students of SMA Muhammadiyah Bangkinang.

## REFERENCES

- Asilestari, P. (2016). The Effects of Teaching Method and Emotional Intelligence Upon Student'S Speaking Skill. *PREMISE JOURNAL: ISSN Online: 2442-482x, ISSN Printed: 2089-3345*, 5(1). <https://doi.org/10.24127/pj.v5i1.424>
- Aulia, H. R., Wahjuningsih, E., & Andayani, R. (2020). Effect of Duolingo Application on Students' English Vocabulary Mastery. *ELTR Journal*, 4(2), 131-139. <https://doi.org/10.37147/eltr.v4i2.71>
- Azzahara, T., Muliati, A., & Sakkir, G. (2023). the Effect of Using the Duolingo Application as a Medium in Improving Students' Vocabulary Mastery. *Journal of Technology in Language Pedagogy (JTechLP)*, 2(3), 523-539.
- Fitri, Y., Melani, M., & Roza, V. (2023). The Effect of Using Duolingo Application Toward Students' Vocabulary Mastery at The Second Grade of SMPN 1 Koto Besar. *Reflinda INNOVATIVE: Journal of Social Science Research*, 3, 8265-8279.
- Herminingsih, D. I. (2021). Exploring the Preservice Teachers' Perception Toward the Use of Duolingo in Teaching Vocabulary to Young Learners. *Jurnal Bahasa Lingua Scientia*, 13(1), 41-64. <https://doi.org/10.21274/lis.2021.13.1.41-64>
- Mohamed Khalifa Gawi, E. (2020). Using Language Entertainment Activities to Enhance University Students' English Vocabulary at Albaha University. *International Journal of Applied Linguistics and English Literature*, 9(4), 109. <https://doi.org/10.7575/aiac.ijalel.v.9n.4p.109>
- Nurhasela, Marleni, L., & Asilestar, P. (2023). An Analysis on Students' Listening Activities as Extramural English. *Journal of English Language and Education*, Vol. 8 No. (2), 68-80.



- Nursyamsiah, E. (2021). Penggunaan Media Aplikasi Duolingo Dalam Meningkatkan Penguasaan Kosakata Bahasa Inggris Siswa Kelas VII SMP Negeri 3 Agrabinta Cianjur. *Jurnal Paedagogy*, 8(1), 67. <https://doi.org/10.33394/jp.v8i1.3251>
- Permatasari, P., Sudirman, A., & Munawaroh, T. (2022). The Effect of Using Duolingo Application Towards Students' Vocabulary Mastery at the Eighth Grade of SMPN 2 Banjarsari Lebak-Banten. *Journal of English Language Learning*, 6(2), 142-148. <https://doi.org/10.31949/jell.v6i2.3624>
- Tiara Putri Utomo, D. (2020). the Implementation of Multiple Intelligences in Improving Student'S Vocabulary Mastery. *Jurnal Pendidikan*, 3(1).