



Facilitating Students' Vocabulary Learning by Using the Duolingo Application: A Case Study at SMP Muhammadiyah 1 Pulau Morotai

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ABSTRACT

This research investigates the impact of the Duolingo application on vocabulary learning among eighth-grade students at SMP Muhammadiyah 1 Pulau Morotai. Vocabulary is a crucial element for language acquisition and effective communication. The study identified a significant deficiency in students' English vocabulary knowledge, as well as the ineffectiveness of traditional teaching methods. To address this issue, the research employed a quantitative experimental design, utilizing pre-tests and post-tests to measure vocabulary improvement in 32 eighth-grade students. Findings revealed a significant enhancement in students' vocabulary skills after using Duolingo, with post-test scores (mean 80.25, Std. Dev. 6.619) considerably higher than pre-test scores (mean 49.09, Std. Dev. 8.204). Statistical analysis confirmed that the use of Duolingo resulted in meaningful improvements in vocabulary mastery. The app's engaging, game-like approach, which includes interactive exercises and instant feedback, effectively motivated students and kept them actively involved in the learning process. In conclusion, the Duolingo application proves to be an effective tool for enhancing vocabulary in English language learning. This study recommends that schools incorporate technology-based learning tools to foster a more engaging educational environment. Future research should explore the long-term effects of using Duolingo and similar applications in various educational contexts.

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ABSTRACT

Tujuan dari Penelitian ini adalah Untuk Mengetahui pengaruh aplikasi Duolingo terhadap kosa kata siswa.menyelidiki dampak aplikasi Duolingo terhadap pembelajaran kosakata di kalangan siswa SMP Muhammadiyah 1 Pulau Morotai. Kosakata sangat penting untuk akuisisi bahasa dan komunikasi yang efektif. Studi ini mengidentifikasi adanya kekurangan yang signifikan dalam pengetahuan kosakata bahasa Inggris siswa, serta ketidakefektifan metode pengajaran tradisional. Untuk mengatasi masalah ini, penelitian ini menggunakan desain eksperimen kuantitatif, dengan memanfaatkan pre-test dan post-test untuk mengukur peningkatan kosakata pada 32 siswa kelas delapan.Temuan penelitian menunjukkan peningkatan yang signifikan dalam keterampilan kosakata siswa setelah menggunakan Duolingo, dengan skor post-test 6.619 yang jauh lebih tinggi dibandingkan dengan skor pre-tes 8.204t. Analisis statistik mengonfirmasi bahwa penggunaan Duolingo menghasilkan perbaikan yang berarti dalam penguasaan kosakata. Pendekatan aplikasi yang menarik dan mirip permainan, yang mencakup latihan interaktif dan umpan balik instan, secara efektif



memotivasi siswa dan menjaga mereka tetap terlibat aktif dalam proses pembelajaran. Secara keseluruhan, aplikasi Duolingo terbukti menjadi alat yang efektif untuk meningkatkan kosakata dalam pembelajaran bahasa Inggris. Penelitian ini merekomendasikan agar sekolah mengintegrasikan alat pembelajaran berbasis teknologi untuk menciptakan lingkungan pendidikan yang lebih menarik. Penelitian di masa depan sebaiknya mengeksplorasi efek jangka panjang dari penggunaan Duolingo dan aplikasi serupa dalam berbagai konteks pendidikan.

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INTRODUCTION

1.1. Background of the Research

Vocabulary acquisition is a key ability in language learning and is essential for mastering any language. Without a suitable vocabulary, children will struggle to grasp texts, communicate effectively while speaking, and write properly and precisely (Nation, 2017). At the junior high school (SMP) level, vocabulary acquisition serves as the foundation for the development of more advanced language skills. Observations conducted at SMP Muhammadiyah 1 Pulau Morotai indicated a lack in students' English vocabulary knowledge and that the media used for teaching were not very effective. Therefore, this research aims to provide a solution for teachers and students by utilizing technology as a learning medium, specifically the Duolingo application, which is based on a game-like approach.

1.2. Identification of the Problem

Based on the background described above, the main problem identified is the students' difficulty in memorizing English vocabulary at SMP Muhammadiyah 1

Pulau Morotai, coupled with the need for more effective teaching media.

1.3. Statement of the Problem

How does the Duolingo Application facilitate students' vocabulary learning?

1.4. Objective of the Research

The objective of this research is to examine the impact of the Duolingo Application on students' vocabulary enhancement.

1.5. Scope of the Research

The scope of the research is teaching writing vocabulary to know pronunciation, spelling, and the meaning of words by using the Duolingo application.

1.6. Significance of the Research

1. For Teachers: In this research, the Duolingo Application becomes an additional medium for students' English vocabulary learning to improve students' vocabulary skills. This is because the Duolingo application provides learning concepts that are easy to understand



2. For Students: In this research, researchers hope that students can find out the effect of the Duolingo application on their vocabulary abilities.
3. For Other Researchers: This research can provide a reference for studies with the same type of variable and within certain research boundaries.

LITERATURE REVIEW

2.1. Some Previous Research Findings

Alan Jaelani et al. (2020) This study focused on students' perceptions of using the Duolingo application as a medium for vocabulary learning. It highlighted that gamification can make learning more enjoyable and fascinating. The research, conducted in a junior high school in Bogor with thirty second-grade children, used questionnaires and interviews. Findings indicated that most students preferred learning English vocabulary using Duolingo due to its easy-to-understand material, ability to eliminate boredom, and encouragement of new ideas.

Similarities with this Research: Both studies aim to explore the use of the Duolingo application in English vocabulary learning and utilize a quantitative method (though Jaelani et al. also used qualitative) with pre-test and post-test components. Differences with this Research Jaelani et al. (2020) primarily focused on students' perceptions, whereas the current research focuses on vocabulary skills through an experimental design. Jaelani et al. used questionnaires and interviews, while this study emphasizes quantitative data collection through pre-test and post-test, followed by statistical analysis.

Husnur Rosyidah Aulia et al. (2020)

This paper examined the effect of the Duolingo application on students' English vocabulary mastery using a quasi-experimental design with a post-test only approach. The participants were eighth-grade students in Jember. The experimental group received treatment using the Duolingo application, while the control group was taught using flashcards. The results showed a significant difference between students who used Duolingo and those who did not, with the experimental group having a higher mean score.

Similarities with this Research Both studies focus on the use of the Duolingo application to improve students' English vocabulary, employ a quantitative method and an experimental design, and utilize pre-test and post-test to assess vocabulary improvement (though Aulia et al. primarily used post-test for their main design). Both analyze data using statistical methods, including the independent sample t-test.

Differences with this Research Aulia et al.'s study used a quasi-experimental design with a post-test only approach, while the current study uses a true experimental design with both pre-test and post-test. Aulia et al.'s study compared an experimental group using Duolingo with a control group using flashcards, while this research involves a different experimental setup and treatment.

2.2. Research Theories

2.2.1. Definition of Vocabulary

Vocabulary is the set of words that a person is familiar with or uses in a given language (Nation, 2017). Mastering vocabulary is one of the linguistic competencies that must be acquired when learning a language (Aisyah &



Hidayatullah, 2023). Vocabulary is the primary skill EFL students need to speak English fluently (Sadewi et al., 2024). As Thornbury (quoted by Putri, 2020) concludes, "Without Grammar very little can be conveyed, without vocabulary nothing can be conveyed." A limitation in mastering vocabulary will cause obstacles for language learners in acquiring a new language.

2.2.2. Type of Vocabulary

According to Ridhi Sikri (2023), vocabulary can be categorized in several ways. One relevant type is: Writing Vocabulary Words used to express oneself through writing, influenced by spelling ability and requiring expertise in vocabulary.

2.2.3. Aspects of Vocabulary in Language Learning

William and Mary (2019) suggest that vocabulary levels should be appropriated by the types of readers and texts. Key vocabulary levels include:

- 2,000-word level Basic everyday words, learned through word lists and easy English books.
- 3,000-word level: Vocabulary for starting to read real English texts, learned through careful reading of different text types.
- 5,000-word level: Wide vocabulary for general reading, practiced by guessing word meanings from context and reading various texts.
- University word level Academic words, learned through the University Word List, intensive reading of academic texts, and studying word roots and prefixes.

2.2.4. The Importance of Learning Vocabulary

Vocabulary is an important aspect that must be mastered to use the language well (Putri, 2020). Nunan states that an extensive vocabulary allows one to obtain meaning from spoken and written text, even without knowing grammatical structures. Without sufficient vocabulary mastery, language learners face significant obstacles.

2.2.5. Effective Tool for Learning Vocabulary

Alan Jaelani et al. (2020) found that Duolingo is an effective tool for providing vocabulary in English learning, as it facilitates understanding and can be used anywhere and anytime (Muddin, 2018).

2.2.6. Discussion of Duolingo

The Duolingo app is considered effective for developing foreign language skills, including English, by adopting a "play-and-learn" concept (Aisyah & Hidayatullah, 2023). It employs various learning methods like dictation, written exercises, and speaking practice. Duolingo incorporates gamification techniques such as skill trees, leaderboards, and in-app currency (Lingots) to motivate users (Aulia, 2020). It also offers a "Duolingo for School" feature for teachers to monitor student progress (Stringer, 2016).

2.2.7. The Purpose of Using Duolingo

Duolingo facilitates students' mastery of new vocabulary through games, preventing boredom (Siang, 2019). It is easily accessible and provides many languages, making it helpful for students learning a new language. Mobile applications like Duolingo offer fun and pleasant means to explore a language,

appealing particularly to younger learners. Features like "Badge" are used to boost student motivation (Huynh, Zuo, & Lida, 2018).

2.2.8. The Procedure of English Vocabulary Learning in Duolingo

Duolingo combines visual, audio, and grammar questions (Wilbert, 2016). Its game-like system with attractive visuals and audio makes learning enjoyable (Putri & Islamiati, 2018). The application covers listening, writing, speaking, grammar, and vocabulary. Exercises include translation, matching, listening, speaking, and fill-in-the-blank (Liang, 2018). Duolingo motivates daily practice, improving vocabulary, pronunciation, and simple grammar (De Castro, da Hora Macedo, & Bastos, 2016).

2.2.9. How to Operate Duolingo Application

1. Download the App: Install Duolingo on a smartphone (iOS/Android) or access via web browser (duolingo.com).
2. Create an Account: Open the app and select "Get Started" or "I already have an account." Sign up using email, Google, or Facebook.
3. Selecting Target: The app features a gamified learning experience with lessons structured into units and levels, engaging speaking, reading, writing, and listening skills.
4. Choose Your Language: Select the language to learn from over 45 options.
5. Set Your Goals: Set a daily goal (5, 10, 15, or 20 minutes), adjustable later.
6. Translation Exercises: Translate text from one language to another

7. Matching Exercises: Match words or phrases with images or corresponding translations.
8. Listening Exercises: Listen to phrases and type what is heard or choose the correct answer.



Image 1. Duolingo Application



Image 2. Account

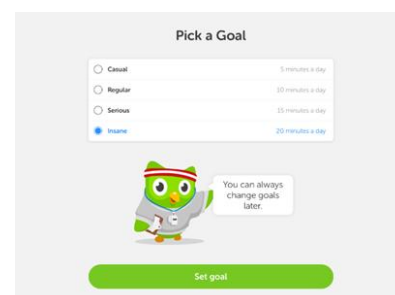


Image 3. Selecting Target



Image 4. Menu and Language



Image 5. Translation Exercise

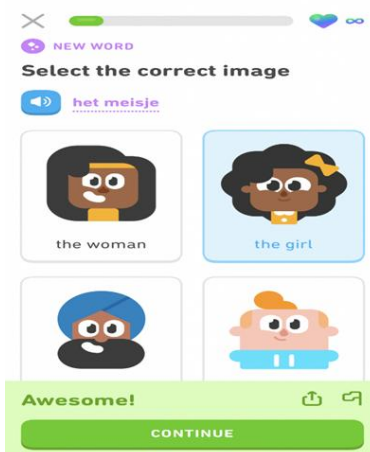


Image 6. Matching Exercise



Image 7. Matching Word



Image 8. Listening Exercise

Students' proficiency levels are adjusted as they progress, with questions assessing pronunciation, grammar, and vocabulary (Tiara, Rahman, & Handriyanto, 2021).

2.2.10. Advantages and Disadvantages of Using Duolingo Application

Advantages: Free, easy to access anywhere/anytime with internet, simple, attractive, minimal ads, content supported by graphics/video/multimedia, game-like concept, interactive, and offers various exercises (Pramesti, 2020). Most learners agree Duolingo helps them discover new ideas, understand better, master vocabulary, and is applicable (Ajisoko, 2020).



Disadvantages: Requires internet connection, unnatural voice in listening exercises, sometimes odd/unusual sentences, lack of grammar explanations, and only displays correct answers without explanation for wrong ones (Pramesti, 2020). Duolingo falls short in advanced topics and primarily excels in writing and reading proficiency, not speaking (Ambrawati, 2022).

2.3. Hypothesis

H0: There is no significant improvement in students' vocabulary learning by using the Duolingo Application. significant improvement in students' vocabulary learning by using the Duolingo Application.

RESEARCH METHODS

3.1. Research Design

This research employed a quantitative method with a pre-experimental design, specifically a pre-test and post-test approach. According to Sugiyono (2016), quantitative research is systematic, planned, and structured. This design aims to determine the impact of Duolingo on extensive English language learning.

3.2. Population and Sample

Population: The total population for this study was the eighth-grade students at SMP Muhammadiyah 1 Pulau Morotai, consisting of 32 students.

Sample: The entire population of 32 eighth-grade students from SMP Muhammadiyah 1 Pulau Morotai was selected as the sample for this research.

3.3. Variable of Research

In this research, there are two variables:

- a. Independent Variable (X) The Use of the Duolingo Application
- b. Dependent Variable (Y) Students' Vocabulary Skills

3.4. Instrument of the Research

Given the pre-experimental research design, the instruments used were a pre-test and a post-test.

3.5. Data Collection Technique

Sidiq (2019) states that data collection in research is a method to obtain field data, enabling the research to yield discoveries or theories.

Pre-test Administered before the treatment to assess students' initial vocabulary mastery. The pre-test consisted of 50 questions (40 multiple-choice and 10 missing text items) and was completed within 90 minutes. Treatment Conducted over six meetings:

- a. First Meeting Introduction to the Duolingo application, explaining its features, functionality, and benefits for vocabulary enhancement.
- b. Second Meeting Guidance on registering a Duolingo account (using email, Google, or Apple ID), selecting the target language, and setting daily learning goals.
- c. Third Meeting Explanation of basic vocabulary (nouns, verbs, adjectives). Students were asked to write down simple everyday words and practice pronouncing at least 10 vocabulary words per session using the Duolingo app.
- d. Fourth Meeting Explanation of vocabulary related to places. Students

described locations and created simple sentences, then shared them to assess their understanding.

- e. Fifth Meeting Focus on "Vocabulary Places" (e.g., schools, hospitals, markets, airports). Interactive exercises, including reading and memorizing vocabulary related to these places, were conducted using Duolingo.
- f. Sixth Meeting Evaluation of the material taught. Students practiced learning through the Duolingo application to improve their vocabulary.

Post-test Administered after the treatment to evaluate the learning outcomes. The post-test had the same format and number of questions as the pre-test (50 questions: 40 multiple-choice, 10 missing text) and was completed within 90 minutes.



Image 9. teaching about Duolingo App

3.6. Data Analysis Technique

The collected data was analyzed using SPSS Windows 22.

1. Descriptive Statistics Used to organize and summarize the variability in the collected scores (Doing, 2023).
2. Normality Test Conducted to determine if the data followed a normal distribution (Kim & Park, 2019).
3. Paired Sample T-Test A statistical method used to compare two sets of related samples (pre-test and post-test) to evaluate the effectiveness of the treatment (Ghozali, 2018).

RESULT AND DISCUSSION

4.1. Researcher Findings

4.1.1. Descriptive Test

Table 1. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Pre Test	32	32	65	49.09	8.204
Post Test	32	70	96	80.25	6.619
Valid N (listwise)	32				

The analysis of the Pre Test and Post Test scores reveals significant insights into student performance. The Pre Test had a minimum score of 32, a maximum score of 65, a mean of 49.09, and a standard deviation of 8.204, indicating a greater variation among the scores. In contrast, the Post Test demonstrated improvement, with a minimum score of 70, a maximum score of 96, a mean of 80.25, and a standard deviation of 6.619, suggesting a higher level of consistency in the scores following the intervention. This comparison highlights the positive impact of the intervention on students' vocabulary learning.

4.1.2. Normality Test

Table 2. Normality Test

		Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Students'	Pre Test	.112	32	.200*	.980	32	.789
	Post Test	.164	32	.028	.951	32	.149

The results of the normality tests for students in both the pre-test and post-test were analyzed using the Kolmogorov-Smirnov test and Shapiro-Wilk methods. For the pre-test, the Kolmogorov-Smirnov test yielded a statistic of 0.112 with a significance value of 0.200, and the Shapiro-Wilk Test produced a statistic of 0.980 with a significance value of 0.789. Both tests indicate that the pre-test data is normally distributed, as the significance values are greater than 0.05, leading us to fail to reject the null hypothesis of normality. In contrast, the post-test results showed a Kolmogorov-Smirnov statistic of 0.164 with a significance value of 0.028, which is less than 0.05, suggesting a potential deviation from normality. However, the Shapiro-Wilk test reported a statistic of 0.951 with a significance value of 0.149, indicating that the data may still be considered normally distributed. This discrepancy between the two tests suggests that while there might be some concerns about normality in the post-test data, the Shapiro-Wilk test offers a more favorable assessment.

4.1.3. Test of Homogeneity of Variance

The results of the homogeneity of variance test indicate that the variances of the two groups (Pre Test and Post Test) are equal. The significance values for all methods (Based on Mean, Based on Median, etc.) are greater than 0.05, leading to the conclusion that the variances are homogeneous. This homogeneity suggests that the two groups can be treated as having similar variability for further statistical analysis.

Table 3. Test of Homogeneity of Variance

	Levene Statistic	df1	df2	Sig.
Based on Mean	.752	1	62	.389
Based on Median	.883	1	62	.351
Based on Median and with adjusted df	.883	1	61.212	.351
Based on trimmed mean	.810	1	62	.372

4.1.4. Paired Sample T-Test

Paired Samples Statistics:

Table 4. Paired Samples Statistic

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 Pre Test	49.09	32	8.204	1.450
Post Test	80.25	32	6.619	1.170

Paired Samples Correlations:

Table 5. Paired Samples Correlations

	N	Correlation	Sig.
Pair 1 Pre Test & Post Test	32	.577	.001

Paired Samples Test:

Table 6. Paired sample T- test

	Paired Differences				t	df	Sig. (2-tailed)
	N	Correlation	Sig.	95% Confidence Interval of the Difference			
	Pre Test & Post Test	32	.577	.001 Upper			
Pair 1 Pre Test - Post Test	-31.156	6.961	1.231	-33.666 -28.646	-25.318	31	.000

The paired samples T-test results show a mean difference of -31.156,



indicating that Post Test scores are significantly higher than Pre Test scores. The significance value (2-tailed) is 0.000, which is well below the 0.05 threshold, confirming high statistical significance. The 95% confidence interval for the difference ranges from -33.666 to -28.646, further supporting a significant improvement. The t-value of -25.318 (note: there's a discrepancy in the t-value provided in the original text's table vs. its description, but the p-value of 0.000 consistently indicates significance) underscores the strength of this difference, suggesting that the intervention was effective in enhancing students' understanding or skills. Overall, this analysis demonstrates a marked improvement in student performance from the Pre Test to the Post Test, indicating the positive impact of the educational intervention.

Discussion

This study aimed to determine whether the use of the Duolingo application leads to an improvement in vocabulary skills among eighth-grade students at SMP Muhammadiyah 1 Pulau Morotai. Based on the data analysis, it can be concluded that the Duolingo Application can indeed improve students' vocabulary skills.

This finding aligns with previous research by Alan Jaelani et al. (2020) and Husnur Rosyidah Aulia et al. (2020), both of which also indicated the effectiveness of Duolingo in vocabulary learning. The similarities with Alan Jaelani et al. (2020) lie in the use of the Duolingo Application for improving students' vocabulary learning. However, a key difference is that Jaelani et al. employed a questionnaire and interview method with 30 participants,

whereas this research used a quantitative method with 32 participants.

Comparing with Pangku Ajisoko (2020), this research also utilized the Duolingo Application for improving vocabulary learning with a pre-experimental design (pre-test and post-test). The difference is that Ajisoko's research involved 10 students practicing Duolingo for 30 days with a "regular" intensity (20 XP per day) and used tests and questionnaires. In contrast, this research used a quantitative method with 32 participants. The increase in student scores in this study is consistent with Ajisoko's finding that students' scores increased after using Duolingo.

In summary, the results of this study reinforce the argument that Duolingo, with its gamified approach and interactive exercises, is an effective tool for facilitating vocabulary acquisition, particularly among junior high school students. The significant improvement in post-test scores demonstrates that students were able to absorb and apply new vocabulary taught through the application.

CONCLUSION

5.1. Conclusion

The purpose of this research was to find empirical evidence regarding the effect of using the Duolingo application on vocabulary mastery among eighth-grade students at SMP Muhammadiyah 1 Pulau Morotai in the 2024/2025 academic year. This study also aimed to provide additional support for the mentioned theories and relevant previous studies.

After conducting the descriptive test, the researcher found that the pre-test score was 49.09, while the post-test score improved to 80.25. To analyze the data



further, the researcher performed a normality test to check if the data followed a normal distribution. The results indicated that the pre-test value was 0.789 and the post-test value was 0.149, both of which are greater than 0.05. This suggests that the data is normally distributed.

Next, the researcher proceeded to the paired sample t-test. The goal of this test was to determine whether the Duolingo application was effective in helping students learn vocabulary. The results revealed a significance value (sig. 2-tailed) of 0.000, indicating that the use of the Duolingo application has been proven effective in enhancing students' vocabulary. As a result, the alternative hypothesis (H_a) is accepted, and the null hypothesis (H_o) is rejected. This shows that there is a positive effect of using Duolingo on students' vocabulary mastery, particularly at SMP Muhammadiyah 1 Pulau Morotai.

Finally, the researcher concludes that the use of Duolingo is effective in improving students' vocabulary mastery, particularly for eighth-grade students at SMP Muhammadiyah 1 Pulau Morotai in the 2024/2025 academic year.

5.2. Suggestion

1. For Teachers: For teachers, researchers hope that with this study, educators will make better use of available technology, such as the Duolingo app, to facilitate English language learning in a more enjoyable and effective way for students, ultimately enhancing their vocabulary.
2. For Students For students, researchers hope that they will take greater initiative in improving their own learning, engaging in self-directed study without waiting for the teacher to instruct them in class. By utilizing technology-based learning tools, such as the Duolingo app, students can enhance their vocabulary in English language learning.
3. For Other Researchers For future research, the researcher hopes that this study will be useful and serve as a reference when conducting research on the topic of "Facilitating Students' Vocabulary Learning by Using the Duolingo Application."

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