



The Effect of the Duolingo Application on Junior High School Students' Vocabulary Mastery at MTsN 2 Gorontalo Regency (*Pengaruh Aplikasi Duolingo terhadap Penguasaan Kosakata Siswa Menengah Pertama di MTsN 2 Kabupaten Gorontalo*)

Annisyah Cesar M Deluma¹, Rahmawaty Mamu², Kartini Lihawa³

^{1,2,3}English Language Education Department, Faculty of Letters and Culture, Universitas Negeri Gorontalo
anisacessar@gmail.com¹, rahmawaty.mamu@ung.ac.id², kartini.lihawa@ung.ac.id³

Article Info	Abstract
Article history: Received: 27 Juli 2026 Revised: 10 Agustus 2026 Accepted: 24 Agustus 2026 Keywords: Duolingo Vocabulary Learning Medium Kata Kunci: Duolingo Kosakata Media Pembelajaran	This study aims to determine the effect of using the Duolingo application on the English vocabulary mastery of students at MTsN 2 Gorontalo Regency. The study employed a quantitative approach with a pre-experimental research design, specifically a one-group pre-test and post-test design. The participants were given a pre-test to measure their vocabulary mastery before receiving the treatment. They then participated in learning activities using the Duolingo application as a learning medium. After the treatment, a post-test was administered to measure changes in students' vocabulary mastery following the use of the application. The research data were obtained from the students' pre-test and post-test scores and were subsequently analyzed using the N-Gain score to determine the level of improvement in students' vocabulary mastery. The results showed an improvement in students' vocabulary mastery after the implementation of Duolingo in the learning process. This improvement was indicated by the difference between the students' scores before and after the treatment. The N-Gain calculation demonstrated that the use of the Duolingo application contributed positively to students' vocabulary improvement. In addition, Duolingo can serve as an engaging learning medium because it provides interactive learning activities and opportunities for students to practice vocabulary independently. Therefore, the use of Duolingo can positively contribute to improving the English vocabulary mastery of students at MTsN 2 Gorontalo Regency and can be considered an alternative learning medium to support English language instruction. Abstrak Penelitian ini bertujuan untuk mengetahui pengaruh penggunaan aplikasi Duolingo terhadap penguasaan kosakata bahasa Inggris siswa di MTsN 2 Kabupaten Gorontalo. Penelitian ini menggunakan pendekatan kuantitatif dengan desain pre-eksperimental, khususnya one-group pre-test and post-test design. Subjek penelitian diberikan tes awal (pre-test) untuk mengukur kemampuan penguasaan kosakata sebelum diberikan perlakuan, kemudian mengikuti proses pembelajaran menggunakan aplikasi Duolingo. Setelah perlakuan selesai, siswa diberikan tes akhir (post-test) untuk mengetahui perubahan kemampuan penguasaan kosakata setelah menggunakan aplikasi tersebut. Data penelitian diperoleh melalui hasil pre-test dan post-test, kemudian dianalisis menggunakan perhitungan N-Gain score untuk mengetahui tingkat peningkatan kemampuan penguasaan kosakata siswa. Hasil penelitian menunjukkan adanya peningkatan kemampuan penguasaan kosakata siswa setelah penggunaan aplikasi Duolingo dalam proses pembelajaran. Peningkatan tersebut terlihat dari perbedaan hasil tes sebelum dan sesudah diberikan perlakuan. Hasil perhitungan N-Gain

menunjukkan bahwa penggunaan aplikasi Duolingo memberikan peningkatan yang positif terhadap penguasaan kosakata siswa. Aplikasi Duolingo juga dapat menjadi media pembelajaran yang menarik karena menyediakan aktivitas pembelajaran yang interaktif dan memungkinkan siswa berlatih kosakata secara mandiri. Dengan demikian, penggunaan Duolingo dapat memberikan kontribusi positif terhadap peningkatan penguasaan kosakata bahasa Inggris siswa MTsN 2 Kabupaten Gorontalo serta dapat dimanfaatkan sebagai alternatif media pembelajaran untuk mendukung proses pembelajaran bahasa Inggris.

Corresponding Author:

Annisyah Cesar M Deluma
Faculty of Letters and Culture
Universitas Negeri Gorontalo
anisacessar@gmail.com

1. INTRODUCTION

Vocabulary is a collection of word that are known and used by a person in communication. In learning english, vocabulary mastery is a very important aspect because words are the basic elements that make up sentences and allow a person to convey a message accurately (Asyiah, 2017). According to Nation (2001) vocabulary is the main foundation in language learning, because without adequate vocabulary understanding, the ability to the main focus in the language learning process. Vocabulary mastery refers to the ability to recognize, understand, and use words accurately in spoken and written communication (Rahmawati, 2026). However Hida et al. (2025) found that students still have vocabulary weaknesses and lack practice in english learning activities.

Students are expected to be able to understand and use simple english expressions in the context of daily life, understand short texts. However, the reality on the ground, as experienced during the field exercise at MTsN 2 Gorontalo Regency, shows a huge gap where many students are not even able to master basic words such as “i want to drink water”, or “i want to play”. Considering the large gap between vocabulary standards and the reality of the field where high school students struggle even with basic phrases, teachers need creative learning media to increase students’ interest in learning vocabulary (Tamuu et al., 2024).

Gamification technologies like duolingo are emerging as an effective solution to bridge this gap, duolingo provides an automated spaced repetition system that scientifically repeats difficult words duolingo also has multimodal exercises of listening, speaking, reading, writing, plus interactive stories through real context with native audio and free, offline AI personalization. Previous research by Rahman et al. (2025), Malinda and Daulay (2024), Ramdhani and Subiyantoro (2025) has explored the use of duolingo applications in vocabulary learning particularly among generation Z students and in urban school environments with the support of adequate technological infrastructure.

A study by Ramdhani and Subiyantoro (2025) shows that duolingo is effective in influence english vocabulary mastery through interactive app-based learning methods. Malinda and Daulay (2024) assesses the effectiveness of duolingo as a popular language learning platform, with finding that reinforce that the app is able to influence overall linguistic ability, including student motivation and engagement during the learning process. Additionally, Rahman et al. (2025) highlights the accessibility and effectiveness of duolingo as a language learning tool, allowing students to achieve their learning goals more efficiently.

The novelty of this study lies in the focus of research that is more specific and contextual than previous research. While previous research has only highlighted the general effectiveness of Duolingo in improving students' vocabulary and learning motivation in an environment supported by adequate technology, this study specifically emphasizes the use of Duolingo as a structured remedial tool to strengthen the basic vocabulary or survival vocabulary of high school students. In addition, this research has novelty in the context of the research location, which is carried out in schools with limited resources and infrastructure. Thus, this study provides a clearer picture of Duolingo’s contribution in bridging English language learning standards with real-world conditions of testing the influence of Duolingo applications in general, but also exploring its role in helping students master basic functional vocabulary that they have not previously mastered.

2. METHODS

This study is a quantitative research using the pre-experimental design method. This study used only one experimental class without a control class. The experimental class was given the treatment of using the duolingo application to influence students' vocabulary mastery. This study uses a one-group pre-test and post test design. Students are first given a pre-test, then given treatment, and ended with a post test to find out the influence of the treatment given. The research design can be described as follows:

- 1) O1 X O2
- 2) O1 = pre-test
- 3) X = treatment
- 4) O2 = post test

2.1 Pre-test

Pre-test are carried out as a first step before treatment. The researcher gave students a vocabulary test to find out the students' initial ability in vocabulary mastery before the use of the duolingo application. Pre-test was conducted to assess students' prior vocabulary knowledge before the treatment was implemented (Tamu et al., 2024). The pre-test consists of multiple-choice questions that include nouns, verbs, adjective, adverbs. This initial test is used to measure a students' basic vocabulary skills before being given a treatment using the duolingo app

2.2 Treatment

The treatment was carried out during four meetings. Where the researcher created an interesting learning atmosphere and supported the student learning process. At each meeting, students use the duolingo app to learn english vocabulary interactively. The vocabulary material studied includes nouns, verbs, adjective, and adverbs.

The learning activities during treatment are carried out through the following steps:

- 1) The researchers asked students to open the duolingo app on their respective devices
- 2) The researcher directed students to take part in vocabulary exercises available on the duolingo app.
- 3) Students learn new vocabulary through the app's reading, listening, and word pronunciation features.
- 4) The researcher provides guides students in understanding the meaning and use of vocabulary learned.
- 5) Students are asked to group vocabulary based on word types such as nouns, verbs, adjectives, and adverbs
- 6) The researcher provides reinforcement regarding the use of vocabulary in simple sentences and procedural text.
- 7) The learning activity ended with evaluation and reflection on the vocabulary that students have learned through the duolingo application.

2.3 Post test

After all treatment are completed, the researcher provides a post test to determine the improvement of students' vocabulary mastery after using the duolingo application (Yulianti et al., 2024). The post test uses the same questions as in the development of students' abilities after being given treatment. By comparing the result of the pre-test and post test, the researcher can determine the influence of the use duolingo application on students' vocabulary mastery.

2.4 Sample Size

A sample is a small subset selected from the entire population, assumed to reflect its traits (Rachman et al., 2024). The sample of this study consisted of 20 students of grade VII B MTsN 2 Gorontalo regency. The sample selection used the purposive sampling technique based on the recommendations of the english subject teacher and the low vocabulary ability of students in the previous assessment. Class VII B was chosen because it is considered the class that needs the most treatment to influence students' vocabulary mastery.

2.5 Data Analysis

The data obtained from the results of the pre-test and post test were analyzed using statistical methods to determine the influence of the use duolingo application on students' vocabulary mastery. The main analysis technique used was the paired sample t-test to compare students' pre-test and post test result before and after the treatment was given. According to Mowu et al. (2025) the t-test was used to find out if there was significant difference in students' vocabulary mastery. In quantitative research, research hypotheses must be clearly formulated and translated into statistical hypotheses so that they can be tested using statistical analysis (Zaki & Saiman, 2021).

Hypothesis testing is carried out with the following:

- 1) H0 : there was no significant effect of the use duolingo app on students' vocabulary mastery
- 2) H1 : there is a significant influence of the use duolingo app on students' vocabulary mastery

If the significance value is less than 0,05 then H0 is rejected and H1 is accepted.

3. RESULTS AND DISCUSSION

Before being given treatment, most students' still had difficulty understanding English vocabulary such as nouns, verbs, adjectives, and adverbs. This condition affects ability of students' to understand the text of procedure. Therefore, Duolingo is used as a learning medium to help students' enrich their vocabulary before entering the core learning material. Through interactive exercises, students' are expected to improve their vocabulary mastery so that they are more confident and easy to understand the procedural text.

3.1 Initial Vocabulary Mastery (Pre-test)

This study was conducted to determine the influence of the use of Duolingo application as a learning medium on students' vocabulary mastery in learning procedural texts in grade VII B MTsN 2 students' of Gorontalo regency. This study involved 20 students' and used pre-test and post test instrument to measure early stages students' still had low vocabulary mastery, especially in understanding nouns, verbs, adjective, and adverbs used in procedural text. This condition shows that students' still have difficulties in understanding English learning material due to limited vocabulary mastery.

Table 1. average pre-test result of class VII B students'

Grade	Score	Frequency of Student's	Percentage
A	86 – 100	0	0%
B	66 – 85	0	0%
C	56 – 65	2	10%
D	46 – 55	3	15%
E	26 – 45	12	60%
F	Under 25	3	15%
Total		20	100%

The table above shows that most students' are still low in the low category in vocabulary mastery. A total 12 students' obtained an E grade and 3 students' obtained an F grade which showed very low vocabulary ability. Only 2 students' obtained grade C and 3 students' obtained grade D. None of the students' obtained grade A or B. These results show that students' initial ability to mastery vocabulary was still low before the use of Duolingo as a learning medium. Therefore researcher use Duolingo to help influence students' vocabulary mastery.

3.2 Gradual Improvement Through the Use of Duolingo App

The treatment in this study was in form of the use of Duolingo app as a learning medium for four meetings. During the learning process, students' actively participate in vocabulary exercises available on the app. The activities carried out include listening exercise, pronunciation exercise, vocabulary recognition, sentence composing, and simple word and sentence translation exercises. The vocabulary learned is directly related to the material of the procedural text, especially nouns, verbs, adjectives, and adverbs.

At the first meeting, students are introduced to Duolingo app and guided to install and use it correctly. Students' begin to recognize new vocabulary and understand the function of vocabulary use in procedural texts. Although students' are still in the adjustment stage to the learning media, they show enthusiasm and active participation during the learning activities. At the second meeting, students' again use Duolingo and focus on learning the nouns and verbs that are often used in the procedure text. Researcher linked the vocabulary exercise on Duolingo to a procedural text titled "how to make lemon drink". Students' are asked to identify the materials and steps and group the nouns and verbs contained in the text. This activity helps students' understand the use of vocabulary in the context of the procedural text.

In the third meeting, learning was focused on adjective and adverbs. Students' again do vocabulary exercises through Duolingo and learn how adjectives are used to describe objects, while adverbs are used to describe actions in procedural steps. After that, students' read the text. "how to make apple juice" and had a group discussion to find the adjective and adverbs contained in the text. Through these activities, students show an increased understanding of use vocabulary in procedural texts. In the fourth meeting. Students' were asked to write the procedural text individually by applying the vocabulary that had been learned during the previous meeting. They wrote texts such as "how to make tea," "how to make coffee," and "how to make juice." Students begin to be able to use nouns, verbs, adjectives, and adverbs more appropriately in their writing. This improvement shows that repeated vocabulary practice through Duolingo has a positive influence on students' understanding and use of vocabulary in meaningful contexts.

3.3 Post Test Result and Comparative analysis

After the treatment using the Duolingo application was completed, the students were administered a post-test to measure their vocabulary mastery and identify changes in their performance after the learning

intervention. The post-test results demonstrated a substantial improvement compared with the students' initial performance in the pre-test. The distribution of students' post-test scores is presented in Table 2.

Table 2. average students' post test results

Grade	Score	Frequency of Student's	Percentage
A	86 – 100	5	25%
B	66 – 85	10	50%
C	56 – 65	1	5%
D	46 – 55	4	20%
E	26 – 45	0	0%
F	Under 25	0	0%
Total		20	100%

As shown in Table 2, the majority of students achieved relatively high levels of vocabulary mastery after the implementation of Duolingo. Ten students (50%) obtained scores in the B category, making it the most dominant achievement level in the post-test. Furthermore, five students (25%) achieved an A grade, indicating that one-quarter of the participants reached the highest performance category. One student (5%) obtained a C grade, while four students (20%) obtained a D grade. Importantly, no students remained in the E or F categories in the post-test. This distribution indicates that the students generally demonstrated better vocabulary performance after participating in the Duolingo-based learning activities.

The comparison between the pre-test and post-test results provides clearer evidence of the changes in students' vocabulary mastery. Table 3 presents the frequency distribution of students' performance before and after the implementation of Duolingo.

Table 3. average students pre-test and post test results

Grade	Score	Frequency of pre-test	Frequency of Post Test
A	86 – 100	0	5
B	66 – 85	0	10
C	56 – 65	2	1
D	46 – 55	3	4
E	26 – 45	12	0
F	Under 25	3	0
Total		20 students'	20 students'

The comparison in Table 3 reveals a noticeable shift in the distribution of students' vocabulary mastery from the lower categories to the higher categories. In the pre-test, none of the students achieved either an A or B grade. Most students were concentrated in the E category, with 12 students (60%), while three students (15%) were categorized as F. Only two students (10%) achieved a C grade and three students (15%) achieved a D grade. This distribution indicates that the students' initial vocabulary mastery was generally low before the implementation of the treatment.

Following the use of Duolingo, the distribution changed considerably. Five students (25%) moved into the A category and ten students (50%) reached the B category. Thus, a total of 15 students, representing 75% of the participants, achieved A or B grades in the post-test, whereas no students had reached these categories in the pre-test. At the same time, the number of students in the E category decreased from 12 students to zero, and the number of students in the F category also decreased from three students to zero. This shift suggests that students who initially demonstrated very limited vocabulary mastery were able to improve their performance after receiving instruction through Duolingo.

The changes are also evident in the C and D categories. The number of students achieving a C grade decreased from two to one, while the number of students in the D category increased slightly from three to four. This increase in the D category does not necessarily indicate a decline in achievement. Rather, it may reflect the movement of students from the lower E and F categories into a higher performance category, while other students progressed further into the C, B, and A categories. Therefore, the overall distribution demonstrates a positive shift in students' vocabulary mastery.

The most notable finding is the disappearance of students from the E and F categories after the treatment. Before using Duolingo, 15 students (75%) were classified within these two lowest categories. After the treatment, none of the students remained in these categories. In contrast, 15 students (75%) achieved A or B grades in the post-test. This change indicates that the use of Duolingo was associated with substantial improvement in students' vocabulary performance.

Overall, the comparison between the pre-test and post-test results indicates that the implementation of Duolingo had a positive effect on students' vocabulary mastery. The improvement was reflected not only in individual test scores but also in the overall distribution of achievement categories. The findings suggest

that Duolingo provided students with opportunities to repeatedly encounter, practice, and reinforce new vocabulary through interactive learning activities. The application may also have increased students' engagement by providing immediate practice and allowing them to learn vocabulary in a more interactive environment. Therefore, the post-test findings support the use of Duolingo as an alternative digital learning medium for improving English vocabulary mastery among students at MTsN 2 Gorontalo Regency. However, the magnitude of improvement should be further confirmed through the N-Gain analysis presented in the subsequent section.

3.4 Hypothesis Veriffication and Significant Results

To find out whether the use of duolingo has a significant influence on students' vocabulary mastery, the researcher conducted a paired samples t-test using microsoft excel. According to Magdalena and Krisanti (2019) the t-test is used to determine whether or not there is a significant influence of independent variables on dependen variables. The analysis was carried out by comparing the results of the paried samples t-test showed a mean value of 36.5 with a standard deviation of 15.588 and a standard error mean of 3.485. the confidence interval is at the lower limit of 29.206 and the upper of freedom of 19 and a significance value of 0.05

Table 4. average paried samples test

	Mean	Std deviation	Std error Mean	Lower	Upper	t	df	One-sided p	Two-sided p
Pair1 PRE TEST- POST TEST	36,5	15,588	3,485	29,206	43,794	10,471	19	0.05	0.05

These results show that is a significant differences between students' vocabulary skills before and after use of duolingo as alearning medium. Thefore , the H0 which states that there is no significant influnece of duolingo is rejected. On the other hand, H1that states there is a significant influence of duolingo use on students' vocabulary mastery is accepted. Overall, the results of statistical analysis prove that duolingo has positive and significant influence on students' vocabulary matery in learning procedural text. The increase in students' scores,participation during learning, and the ability to use vocabulary shows taht duolingo can be effective learning medium to improve english vocabulary learning in grade VII MTsN 2 gorontalo regency

4. CONCLUSION AND SUGGESTIONS/RECOMMENDATIONS

4.1 Conclusion

Based on the results and discussion of the research, it can be concluded that the use of the Duolingo application as a learning medium has a positive influence on the mastery of English vocabulary of grade VII students at MTsN 2 Gorontalo Regency for the 2025/2026 school year. A significant improvement in students' vocabulary learning outcomes, as seen from the comparison of pre-test and post-test scores, shows that Duolingo is effective in assisting students in learning nouns, verbs, adjectives, and adverbs in learning procedural texts. The change in the distribution of students' scores from the low category (E and F) in the pre-test to the higher category (A and B) in the post-test further proves that interactive application-based learning is able to improve students' understanding and mastery of English vocabulary more effectively. The results of this study also showed that the alternative hypothesis (H_1) was accepted and the null hypothesis (H_0) was rejected, which means that there was an effect of Duolingo use on students' vocabulary mastery.

This research contributes to the field of English language learning, especially in the use of digital learning media to improve students' vocabulary mastery. The findings of this study provide an idea that the use of the Duolingo application can create a more interactive, engaging, and effective learning process for students. according to Ntuiyo et al. (2025) Interactive learning media can significantly improve students' vocabulary mastery. For teachers, this study shows that Duolingo can be used as an alternative learning medium to help increase students' motivation and engagement in learning English vocabulary. Although the implementation of the study still found several obstacles, such as differences in students' initial ability to use the application and the need for teacher guidance during the learning process, overall, the use of Duolingo has been proven to be able to help students understand English vocabulary better and make the learning process more fun and meaningful.

4.2 Suggestions/Recommendations

In terms of recommendations for future research, researchers can explore other aspects that can improve students' vocabulary mastery, such as integrating multimedia learning media or combining the use of the Duolingo app with collaborative learning models in the classroom. Further research could also consider long-term studies to look at the effect of Duolingo use on vocabulary memory as well as students' overall

English language skills. In addition, expanding the scope of research to include more diverse student characteristics, different levels of education, or learning materials other than procedural texts can provide a more comprehensive understanding of Duolingo's potential in various educational contexts. English teachers are advised to use effective and engaging learning media to help students improve vocabulary (Munir, 2016).

In conclusion, this study not only shows the benefits of using the Duolingo app in improving students' vocabulary mastery, but also opens up opportunities for technology-based English learning innovations in the future. This research emphasizes the importance of developing more creative and interactive learning strategies to meet students' learning needs and adapt to modern educational developments. By implementing digital learning media such as Duolingo and other interactive learning approaches, teachers can create a more dynamic, effective, and enjoyable learning environment that supports students' academic success while increasing their motivation to learn.

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