

The Effect of Using Duolingo Application on Students' Vocabulary Mastery

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Article Info	Abstract
Received: 30 March 2026 Reviewed: 10 April 2026 – 20 June 2026 Accepted: 28 June 2026 Published: 30 June 2026	Purpose To determine whether the use of the Duolingo application affects students' vocabulary mastery and to identify its effectiveness in improving vocabulary learning among English Education students at Makassar State University. Methodology This study used a quantitative experimental design with pre-test and post-test. The participants were 30 students from the English Education Department. Students practiced Duolingo for 30 days with a target of 20 XP per day. Data were collected through vocabulary tests and questionnaires. Results/Findings The results showed that students' post-test scores were higher than their pre-test scores, indicating improvement in vocabulary mastery after using Duolingo. The average post-test score was higher than the pre-test score, proving that Duolingo had a positive effect on vocabulary learning. Implications Teachers can integrate Duolingo into English teaching as a modern and engaging learning tool. It can motivate students, provide equal practice opportunities, and support independent vocabulary learning through mobile devices.
Keywords: Duolingo application; vocabulary mastery; English learning; mobile learning; technology in education	

1. Introduction

Duolingo is effective because it teaches fundamental knowledge and crucial English abilities. The acquisition of vocabulary in Duolingo is the fundamental and most significant skill. There are numerous levels and vocabulary teaching techniques in the application that might aid pupils in their language learning. In this sense, vocabulary is the most crucial and fundamental component of learning a language, especially English. Students learning English should be familiar with vocabulary since doing so will encourage them to utilize the language to communicate and convey their ideas (Muddin, 2018).

There are language elements like vocabulary, grammar, and pronunciation that connect those four primary skills. This study focuses on vocabulary among all of those linguistic constituents. It is impossible to separate vocabulary development from other areas of English language study. The foundational skill that learners must master before they may advance to other language proficiency levels, such as speaking, listening, reading, and writing, is vocabulary. The learners' vocabulary needs to be extensive in order to have strong English competence. Vocabulary is an essential part of language ability and contributes significantly to how well language learners speak, listen, read, and write. Lacking a large vocabulary and learning techniques, they are unable to make use of the many chances for language learning that are available to them, including listening to the radio, speaking with native

speakers, reading, and watching television. It is impossible to separate vocabulary development from other areas of English language study.

If students lack vocabulary, learning English will be difficult. Teachers play a crucial role in ensuring that students learn effectively. Teachers must pay attention to developing learners' vocabularies. Teachers are expected to employ creative methods and media that inspire pupils to learn language. The majority of educators have already incorporated media into their lessons, yet they often overlook improving vocabulary development. English learning can now be done through new media. One of them makes use of applications that can be installed and set up on smartphones. The programs are known as Duolingo. The author must therefore consider Duolingo's impact on in-depth learning. The Google Play Store offers the free language-learning program Duolingo. Duolingo "builds a world with free education and no language barriers," as it is claimed on its website. Users can translate websites while also learning languages for free.

There are numerous languages available on Duolingo for learners to select. Language options include English, Arabic, Spanish, French, Dutch, and others. Additionally, it offers a forum for educators where users can discuss subjects and themes with one another as either teachers or students to learn. It can assess students' performance and commitment in pleasant ways. The apps offer data such as points won, a course overview tree, a streak, and the amount of time spent. There are many opportunities for practice, making it simple for beginners to pick up a new language. The apps are straightforward to use, and the steps and processes are clear. Children, teenagers, parents, and other people of all ages are encouraged to use Duolingo. Due to its simplicity of use and increased engagement, Duolingo is a good choice as a classroom teaching tool. Grego and Vesselinov conducted a study to determine the efficacy of Duolingo for language acquisition. Their study revealed that the students were happy with Duolingo's language learning capabilities and that they loved using it.

The adoption of Duolingo as a language learning tool can boost the proportion of active students in the teaching and learning process. One of the application technologies being discussed and used by individuals as a tool for language learning is Duolingo. With the introduction of extremely sophisticated technology, language acquisition has become simpler. Anyone who wishes to learn languages can benefit greatly from using this technology. In language learning, among the language skills that any learner needs, vocabulary is the key component (Guaqueta, 2018).

As stated above, this study aims to determine the effect of using Duolingo on students' vocabulary mastery. It is also hoped that tutors can utilize electronic media such as Duolingo to support more modern and interesting teaching and learning activities, such as mobile or web-based applications. Through this article, the writer wants to answer the problem formulation. Therefore, the hypothesis is "There is a significant effect of using Duolingo on Students' Vocabulary Mastery."

2. Literature review

2.1. Vocabulary

Vocabulary is one aspect of language skills whose existence is very important and very important to master. According to Hornby (2009, p. 1707) "Vocabulary is the number of words that make up language, the word known well, or used by someone, in the trade profession, etc." Meanwhile, the Oxford Advanced Learner's Dictionary (2008, p. 1662) defines vocabulary as "all words that someone knows or uses".

The definition of vocabulary was also put forward by Richard in Curriculum Development in Language Teaching (2003: 4) that "Vocabulary is one of the best things that concern linguists." So, it can be concluded that English vocabulary is a group of English words that are known by someone or to express an activity, object, characteristic, and so on. Someone's vocabulary is defined as the set of all words the person understands or any words that the person might use to compose a new sentence.

Furthermore, according to Nunan (1991: 117), a strong vocabulary is a necessary component for successfully using a second language. Language learners cannot both produce and receive the target language without mastering a broad vocabulary. Similar to this, Richard and Renandya (2002, p. 255) assert that vocabulary is a crucial part of language ability and lays a lot of the groundwork for how effectively students speak, listen, read, and write. A crucial component of language proficiency is vocabulary because it plays a significant role in all language skills, including speaking, listening, reading, and writing.

2.2. Duolingo

Launched in November 2011, the free language-learning program Duolingo was created by Luis Von Ahn and Severin Hacker. It currently offers 68 different language courses in 23 languages, with 22 more still being developed. For users who have reached a specific level, Duolingo offers speaking practice, dictation, and written study. Applications for iOS, Android, and Windows Phone are created in a way that users can keep enhancing their capacity to communicate anytime, anywhere. With Duolingo, learning is made to be appealing and simple to

grasp. For its innovation, Duolingo was awarded Google Play's Best of the Best 2013 by Google because of the powerful gamification techniques used to get many people to learn new knowledge.

Quoted in an article from The Guardian, Luis Von Ahn wanted to create a way to learn the language for free. "If you look at language learning in the world, there are 1.2 billion people learning a foreign language, and two-thirds of those people are learning English so they can get a better job and earn more. The problem is that they do not have equity, and most language courses cost a lot of money.

2.3. Students' vocabulary mastery

Teachers can use media according to their needs. Regarding technological developments, learning media can be grouped into two broad categories, namely the choice of traditional media and the choice of the latest media technology (Seels & Glasgow in Arsyad, 2002, p. 33). It was further explained that ordinary media options can be divided into projected visuals, for example blurry projections, overhead projections, slides and film strips, and non-projected visuals, for example pictures, posters, photos, charts, graphs, diagrams, info boards, presentations. Multimedia, e.g. slide plus sound (tape), multi-image, dynamic projected visuals, e.g. film, television, video, print, textbooks, modules, programmed texts, workbooks, periodicals, hand-out magazines, games, e.g. puzzles, simulations, board games and realia, e.g. models, specimens (e.g.), manipulatives (maps, dolls). The choice of the latest technology media can be differentiated into telecommunication-based media, e.g., teleconferences, distance lectures, and microprocessor-based media, for example, computer-assisted instruction, computer games, intelligence tutoring systems, interactive hypermedia, and compact discs.

3. Research method

3.1. Research design

This study uses experimental research with a pretest and post-test. If the post-test score is higher than the pre-test, this indicates an increase in the learner's vocabulary and effective treatment as a medium in teaching vocabulary.

3.2 Research setting and participants

This research was conducted at the Department of English Education, Makassar State University. The participants were fifteen fifth-semester students from the 2025/2026 academic year. They were instructed to practice using the Duolingo application every day for thirty days after finishing their campus classes, with a daily target of 20 XP (points on Duolingo).

3.3 Research instruments

Two instruments were employed in this research: tests and a questionnaire. The tests, which consisted of a pre-test and a post-test with 25 basic vocabulary questions each, were used to determine the impact of using Duolingo on vocabulary mastery. Meanwhile, a closed-ended Likert-scale questionnaire was utilized to explore students' perceptions after using the application. The questionnaire comprised 12 items covering three aspects: students' interest, as well as the strengths and weaknesses of Duolingo.

3.4. Data collection technique

The data collection procedure was carried out in several stages. First, the pre-test was administered before the treatment to measure the students' initial vocabulary knowledge. Next, the students underwent the treatment by practicing Duolingo for thirty days. After the treatment period, the post-test was given to measure the students' vocabulary scores following the implementation of the application. Finally, the questionnaire was distributed to the students at the last meeting.

3.5. Data analysis technique

The data were analyzed by comparing the pre-test and post-test results. This comparative analysis was conducted to investigate the impact of the Duolingo application on increasing students' vocabulary mastery. If the post-test scores were higher than the pre-test scores, this would be interpreted as evidence of vocabulary improvement and indicate that the treatment was effective as a medium in teaching vocabulary.

4. Results

In the pre-test and post-test, the learners were asked to complete some related questions to learners' proficiency in English vocabulary. The questions type is the same, but the questions are different to each other. The results of the pre-test and post-test can be seen in table 1.

Table 1: Results of pre-test and posttest

No	Pre-test	Post-test	Group
1	80	82	1
2	79	80	1
3	82	84	1
4	82	84	1
5	80	82	1
6	83	85	1
7	83	85	1
8	84	86	1
9	78	81	1
10	79	83	1
11	80	85	1
12	80	84	1
13	77	80	1
14	85	88	1
15	83	88	2
16	86	81	2
17	81	83	2
18	81	84	2
19	80	81	2
20	80	84	2
21	83	81	2
22	84	86	2
23	86	83	2
24	89	89	2
25	89	86	2
26	84	85	2
27	81	82	2
28	80	81	2
29	80	80	2
30	89	79	2

Based on the table above, the highest pre-test score is 89 and the lowest score is 77. To get pre-test results, scores are calculated to see the average score. The average value of the pre-test is 83.27. It can be concluded that most of the student scores are still low. Based on the table above, the highest post-test score is 90 and the lowest score is 79. The criteria for the post-test average score are 83.80. Based on the results of the students' pre-test and post-test scores, there was a significant increase in the students' average score.

Table 2: Group statistics

	group	N	Mean	Std. Deviation	Std. Error Mean
Pre-Test	1	15	81.13	2.503	.646
	2	15	83.27	3.105	.802
Post-Test	1	15	83.80	2.513	.649
	2	15	82.87	2.475	.639

Table 3: Independent samples 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
Pre-Test	Equal variances assumed	.320	.576	-	28	.048	-2.133	1.030			-4.243	-.024
	Equal variances not assumed			-	26.79	.048	-2.133	1.030			-4.247	-.020
Post-Test	Equal variances assumed	.044	.836	1.025	28	.314	.933	.911			-.932	2.799

Equal variances	1.025	27.99	.314	.933	.911	-.932	2.799
not assumed		3					

This study found that almost all students obtained significant scores from the post-test pre-test. The post-test score data shows that there is a development in students' learning abilities score. The average value of the post-test is greater than the pre-test ($83.80 > 82.87$) which means that the learner's vocabulary mastery has increased and needs to be improved. From these results there was a significant increase in student scores before and after using Duolingo extensively. So, this answers the hypothesis in the research that there is an effect of using the Duolingo application on student vocabulary mastery.

5. Discussions

The findings of this study indicate that the use of the Duolingo application had a positive effect on students' vocabulary mastery. Based on the pre-test and post-test results, most students showed improvement after using Duolingo for thirty days. The average post-test score was higher than the pre-test score, which means that students gained better vocabulary understanding after the treatment. This result supports the hypothesis that Duolingo can significantly improve students' English vocabulary mastery. The improvement of students' vocabulary mastery can be influenced by several features provided by Duolingo. The application offers interactive exercises, repetition techniques, pronunciation practice, and gamification elements such as points, streaks, and rewards. These features motivate students to practice English vocabulary regularly without feeling bored. In addition, Duolingo allows students to learn independently anytime and anywhere through their smartphones. This flexibility helps students become more active and responsible in their learning process. Furthermore, the results of this study are in line with previous studies conducted by Ajisoko (2020), Munday (2016), and Aulia et al. (2020), which found that Duolingo is effective in improving students' vocabulary learning. Those studies explained that technology-based learning applications increase students' motivation, engagement, and learning outcomes. Therefore, this study strengthens the idea that mobile-assisted language learning applications can support English teaching and learning effectively. However, several limitations were also found in this study. First, the number of participants was limited to only 30 students from one university, so the findings cannot be generalized to all learners. Second, the treatment was conducted only for thirty days, which may not fully represent the long-term impact of Duolingo on vocabulary mastery. In addition, some students experienced inconsistent improvement because individual learning motivation and practice frequency may affect the learning results. Despite these limitations, this study proves that integrating technology into English learning activities gives positive contributions to vocabulary development. Duolingo can be considered an alternative learning medium that supports both classroom learning and independent learning. Teachers are encouraged to use digital applications such as Duolingo to create more engaging, interactive, and student-centered learning environments, especially in the digital era and Industry 4.0.

6. Conclusions

Teachers in Industry Revolution 4.0 must include technology into their English language instruction. Most students have access to a smartphone for information. Teachers should adapt their instruction to students' needs using the most recent technology. One of the best apps for boosting vocabulary learning in the English language is Duolingo. One of the most useful tools for teaching and learning vocabulary is Duolingo. Due to the positive feedback, they have received from these apps and the fact that they are simple to grasp and give each learner an equal chance to practice the content, Duolingo can help students stay engaged in their studies and even inspire them to try out new learning strategies.

Declaration of conflicting interest

The authors declare that there is no conflict of interest in this work

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