

Duolingo Application: Enriching Vocabulary Mastery Of EFL Students

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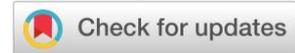
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ABSTRACT

This research exposes vocabulary mastery of eleventh-grade students by utilizing Duolingo apps. Critical issues namely limited vocabulary knowledge, low motivation, and lack of practice had hindered students' language development. By employing a cluster random sampling method, the research involved a pretest and posttest to evaluate students' vocabulary before and after using the Duolingo application. Various vocabulary assessments in terms of making sentences, multiple-choice, and matching exercises were distributed to ensure a comprehensive evaluation of students' understanding in concrete nouns, action verbs, and descriptive adjectives. The results indicate that there is a statistically increase of the students' score in the experimental group from pretest to posttest (71.68 to 73.92). The results of the paired t-test also present a statistically significant difference ($t = -5.209, p = 0.000$). In contrast, the control group using conventional techniques only showed a small increase from 71.68 to 73.92, and the results of the t-test showed no significant difference ($t = -1.430, p = 0.166$). This suggests that the Duolingo application effectively enhances students' vocabulary mastery and overall language proficiency. It can be concluded that integrating innovative teaching methods, such as gamified learning through Duolingo, can significantly boost students' motivation and engagement in language learning. Therefore, teachers can explore diverse teaching strategies that cater to various learning styles and encourage students to actively participate in language practice through interactive features of the application. Overall, this research contributes valuable insights into the role of technology in language learning and its potential to transform traditional learning approaches.

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KEYWORDS

Duolingo Application, Vocabulary Mastery, EFL Students.

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1. Introduction

Vocabulary is one crucial aspect in learning English. It is a fundamental component of language proficiency and plays a primary role in how well learners speak, listen, read, and write (Richards & Renandya, 2022). Vocabulary is a list of words and phrases organized alphabetically, and it is essential for students to expand their language skill (Asipi et al., 2023). Mastery of vocabulary is a crucial element of English language acquisition as it bridges the success of the four language skills (Jiang et al., 2020; Rahman et al., 2019; Ko et al., 2025). A strong vocabulary base also supports the development of grammar, pronunciation, and overall communication skills. Therefore, mastering vocabulary is essential for achieving fluency and success in language learning (Weda et al., 2022; Mochammad et al., 2025; Cahyani et al., 2025). Thus, if we lack vocabulary, we cannot create good communication either oral or written.

In the Emancipated Curriculum of Indonesia, teaching English vocabulary for Senior high school level is integrated with other language skills. The main focus of this curriculum is on increasing students' communicative competence in understanding and using English effectively based on real life situations and context. Nevertheless, numerous teachers and previous researchers confirm that many students still face challenges in learning vocabulary. Difficulties in pronouncing and spelling words, using words in sentences contextually and understanding their meaning are main issues in learning vocabulary. In addition, monotonous learning strategies and methods also result in limited vocabulary and comprehension. These issues are also experienced by the students of SMA 1 Dampal based on the information of the teacher. Therefore, to overcome these problems, it is important to provide innovative solutions. One of solution is by utilizing digital media, namely Duolingo apps

Duolingo application is one of digital media in which it is creatively designed to learn vocabulary. It stands out as one of the most widely famous platforms for learning languages because it is made to be easy, fun and interactive to learn new languages (Mahbub et al., 2020). Duolingo is one of the digital applications that support EFL learners in learning new vocabularies (Wahyuningsih & Putra, 2020). Accessibility, affordability, and effectiveness of language learning for all individuals are primary objectives of Duolingo (Shortt et al., 2023). Thus, it can be claimed that Duolingo effectively facilitates and supports EFL learners to learn vocabulary in a structured way or independently, both outside and inside the classroom. This can improve English vocabulary mastery more effectively and contextually, while fostering a higher interest in learning through their preferred digital medium.

Teaching and learning vocabulary through Duolingo have been examined by numerous researchers. Duolingo is a gamified language learning app that can expand students' vocabulary acquisition (Hernadijaya, 2020). Duolingo is very interesting and effective to bridge students to easily understand the material, especially in vocabulary learning (Ajisoko, 2020; Tammase et al., 2025; Faisal et al., 2025). Duolingo is a suggested app that is able to enhance students' vocabulary mastery (Achmad & Anggreni, 2025). All these studies inform that students enjoy learning through Duolingo, therefore, the researchers are interested in conducting this study to break the students' challenges and to identify the students' vocabulary improvement.

2. Methodology

This research utilized a quasi-experimental design. By selecting the cluster random sampling technique, Cluster random sampling is a practical and efficient method for obtaining representative samples from a large and distributed population. The researcher will prepare three sheets of paper containing the names of each class. Then, the paper is put into a box. When the researcher shakes the box, the paper falls first as the experimental group for this study, class F3 is selected as the experimental group and F1 as the control group. There are two variables in this study, namely the independent variable and the dependent variable. The independent variable is the use of the Duolingo application (X) and the dependent variable is the students' vocabulary (Y). The instruments of this study are tests, namely the pre-test and post-test. Making sentences, multiple choices, and matching exercises are test patterns to measure the comprehensive evaluation of students' understanding of concrete nouns, action verbs, and descriptive adjectives. In addition, this study is limited to understanding the meaning and composing simple sentences. Furthermore, the collected data were analyzed using SPSS software.

3. Result and Discussion

3.1 Result

After collecting the data from both the pre-test and post-test, the researchers analyzed the results. The analysis focused on comparing students' performance before and after the treatment. The findings are presented as follows.

Table 1. Results of the average value and SD of the experimental group

Paired Samples Statistics		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Before being given Duolingo application	69.92	25	8.674	1.735
	After being given Duolingo application	78.88	25	9.989	1.998

The data on the table above indicates that the students achieve significant progress in mastering vocabulary after implementing Duolingo apps. The average improvement was 8.96 points. This result suggests that the use of digital learning platforms can enhance students' vocabulary acquisition. It also shows that Duolingo provides an engaging and effective medium for independent language learning.

Table 2. Results of the average value and SD of the control group

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Before being given conventional technique treatment	71.68	25	8.204	1.641
	After being given conventional technique treatment	73.92	25	8.426	1.685

The data in the table above shows that statistically students do not show significant progress in vocabulary mastery after teaching using traditional techniques. Compared to the experimental group, the average improvement of students in the control group is much lower

The paired samples correlation shows a statistically significant moderate positive correlation ($r = 0.583, p = 0.002$) between pre-test and post-test scores in the experimental group. This indicates that the two sets of scores are related and suitable for a paired samples t-test.

Table 3. Results of normality test values and justification for paired t-test of experimental group

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Before implementing Duolingo application and after implementing Duolingo application	25	.583	.002

The paired samples correlation reveals a statistically significant moderate positive relationship ($r = 0.557, p = 0.004$) between the pre-test and post-test scores in the control group. This indicates that the two sets of scores are related, justifying the use of a paired samples t-test. The correlation further suggests that students' initial performance is connected to their subsequent achievement. This provides a stronger basis for interpreting the effect of the treatment on their learning outcomes.

Table 4. Results of normality test values and justification for paired t-test of control group

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Before implementing conventional technique treatment and implementing conventional technique	25	.557	.004

The results of the paired t-test indicate a statistically significant improvement in scores after using the Duolingo application, $t(24) = -5.209, p < .001$. The negative mean difference (-8.960) suggests that the post-test scores were significantly higher than the pre-test scores (i.e., improvement). This finding demonstrates the effectiveness of Duolingo in enhancing students' vocabulary mastery. It also confirms that technology-assisted language learning can produce measurable academic benefits.

Table 7. Results of the paired t-test) and the effect size of the experimental group

Paired Samples Test

Mean	Paired Differences		95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
	Std. Deviation	Std. Error Mean	Lower	Upper			

Pair 1	Before being given Duolingo application and after being given Duolingo application	-8.960	8.600	1.720	-12.510	-5.410	-5.209	24	.000
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The paired t-test showed no statistically significant difference between pre-test and post-test scores in the control group, $t(24) = -1.430$, $p = .166$. The mean difference (-2.240) indicates a small, non-significant improvement in scores after applying the conventional technique. This result suggests that traditional methods did not substantially enhance students' vocabulary mastery. It also highlights the contrast with the experimental group, where the use of Duolingo produced significant gains.

Table 8. Results of the paired t-test) and the effect size of the control group

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Interval Difference Lower	Confidence of the Upper				
Pair 1	Before implementing conventional technique treatment and after implementing conventional technique	-2.240	7.833	1.567	-5.473	.993	-1.430	24	.166

The results of the paired t-test present a statistically significant difference ($t = -5.209$, $p = 0.000$). In addition, the correlation test shows a significant relationship between the scores before and after treatment ($r = 0.583$, $p = 0.002$), which supports the validity of the use of the t-test. In contrast, the control group using conventional techniques only showed a small increase from 71.68 to 73.92, and the results of the t-test showed no significant difference ($t = -1.430$, $p = 0.166$). Thus, it can be interpreted that Duolingo application is more effective than conventional techniques in improving learning outcomes.

3.2 Discussion

In conducting this research, the researchers focused on teaching concrete nouns, action verbs, descriptive adjectives and limited in meaning and use. Initially the students pointed out their challenges in identifying the meaning of the word and making simple sentences. Therefore, Duolingo is utilized to solve these problems. Statistically, the result of this study confirms that Duolingo is successful in breaking the students' challenges. Through Duolingo, the students are more motivated and excited to find new words and its meaning in various topics through playing. They seem to show high curiosity in learning the material through the digital apps and eliminate their boredom. Duolingo as one of the digital games is able to engage learners in learning vocabulary (Wahyuningsih & Putra, 2020). Mobile game-based language learning in Duolingo features supports vocabulary improvement of a learner (Gamlo, 2019). Digital game-based language learning has potential to boost students' motivation, engagement, and vocabulary acquisition (Rahmatika et al., 2025). The integration of gamification in language learning provides learners to improve their creative, critical, and problem-solving skills (Mee et al., 2024).

The results of this study strengthen previous research conducted by Ajisoko, (2020), (Achmad & Anggreni, (2025) and Hernadijaya, (2020) that the Duolingo application is still one of the innovative media that makes a major contribution to foreign language learners. Compared to conventional media, learning through digital games is more interactive and fun for today's learners or Gen Z who have a special affinity with technology (Turner, 2015). Therefore, teachers are still advised to use Duolingo as one of the learning resources and media both structured and independent, because it not only teaches language but also indirectly teaches about the use of technology.

In addition, the findings of this study provide practical implications for language teaching and learning in the digital era. The integration of Duolingo into classroom practice can serve as a supplementary tool to enhance students' engagement and motivation, while also supporting independent learning outside the classroom. This aligns with current educational trends that emphasize learner autonomy, blended learning, and the incorporation of technology to meet diverse learning styles. By adopting such approaches, teachers can create a more dynamic and adaptive learning environment that addresses the needs of modern learners.

4. Conclusion

Based on the results of this research, it can be concluded that the Duolingo application is an effective learning medium for elevating students' vocabulary mastery in English. The findings demonstrate a significant improvement in the vocabulary scores of students who were taught by using the Duolingo app compared to those taught by using conventional methods. These results claim that integrating the Duolingo application in vocabulary instruction can positively affect students' learning outcomes, especially in mastering vocabulary related to concrete nouns, action verbs, and descriptive adjectives. Therefore, the Duolingo application can be considered as a valuable alternative teaching medium to support vocabulary learning in alignment with the goals of the Emancipated Curriculum, which emphasizes contextual and communicative competence.

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