

## **THE EFFECTIVENESS OF DUOLINGO IN IMPROVING VOCABULARY MASTERY AMONG FOURTH-GRADE STUDENTS**

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### **ABSTRACT**

This study aims to investigate the effectiveness of the Duolingo application in enhancing vocabulary mastery among fourth-grade elementary school students. Many young learners struggle to retain new English vocabulary using conventional methods, highlighting the need for engaging and interactive digital tools. Using a pre-experimental one-group pre-test and post-test design, 20 students used Duolingo for vocabulary practice over four weeks, with eight sessions lasting approximately 45 minutes each. Data were collected through vocabulary tests before and after the intervention. The results show a significant increase in students' post-test scores, indicating that Duolingo positively impacts vocabulary acquisition. This finding supports the integration of game-based digital tools into language instruction for young learners. Unlike previous studies that mostly focus on student perceptions or older learners, this study fills a clear research gap by providing empirical evidence of Duolingo's measurable effect on vocabulary improvement in elementary students. This is novel because younger learners have different cognitive characteristics, requiring more visual, interactive, and repetitive activities to stay motivated and retain new words effectively. By testing Duolingo in this unique context with actual test scores, the study demonstrates that digital gamified learning can be both motivating and effective for primary students. The research contributes to the existing body of literature by emphasizing measurable vocabulary gains rather than perceptions alone.

**Keywords:** Duolingo, Elementary Students, Game-Based Learning, Pre-Experimental Design, Vocabulary Mastery

## INTRODUCTION

Vocabulary is an essential aspect of English language learning that significantly influences students' ability to communicate effectively. It serves as the basic building block of language, supporting the development of listening, speaking, reading, and writing skills. According to (Marzuki, 2015) vocabulary represents a collection of words used by individuals in both spoken and written forms, and without adequate vocabulary, learners will encounter difficulties in understanding or conveying meaning. (Susanti, 2002) supports this view, stating that vocabulary consists of the set of words existing in a language, which individuals must master to communicate successfully.

However, Although Various Studies Have Investigated The Use Of Duolingo For Vocabulary Learning, These Studies Primarily Focus On Students' Perceptions Or Involve Older Learners Such As High School And University Students. There Remains A Lack Of Empirical Research That Specifically Examines How Duolingo Improves Vocabulary Mastery Among Elementary School Students. This Research Gap Is Important Because Young Learners Require Different Teaching Approaches From Adults And Need More Visual, Interactive, And Repetitive Activities To Sustain Their Motivation And Retention

For young learners, vocabulary mastery is especially important since it lays the foundation for future language learning. However, many elementary school students struggle to retain new vocabulary due to their limited exposure to English and abstract memorization techniques. This condition often results in reduced motivation and weak language performance. (Permatasari et al., 2022) emphasize that vocabulary instruction should go beyond simple memorization and focus on pronunciation, contextual usage, and word comprehension to help learners internalize new vocabulary more effectively.

To address these challenges, effective vocabulary teaching strategies must be implemented. (Carneiro, Raphae, 2014) outlines six key principles for teaching vocabulary to young learners: setting clear learning aims, choosing vocabulary relevant to students' needs, providing meaningful presentation, contextualizing vocabulary, promoting inference and guessing strategies, and encouraging repeated exposure. These principles guide educators in designing instruction that supports vocabulary retention and application in real-life contexts.

In the context of 21st-century education, technology has emerged as a powerful tool to enhance language learning (Prensky, 2001). Among various educational applications, Duolingo has gained recognition for its effectiveness in vocabulary development. As noted by (Vesselinov & Grego, 2012), Duolingo uses gamification—points, levels, feedback, and

progress tracking—to create an interactive and enjoyable learning experience. The app also supports visual, auditory, and kinesthetic learning styles through multimedia content. These features are particularly suitable for young learners, as they align with children's natural curiosity and preference for play-based activities.

Research supports the use of Duolingo in vocabulary acquisition. (Suci, 2022) found that 70% of students agreed that Duolingo helped them learn vocabulary more easily, with learners showing a positive attitude toward the app. (Jaelani & Sutari, 2020) also reported that Duolingo is an effective medium for vocabulary learning due to its engaging features. Additionally, (Razikna, 2023) noted that students found Duolingo's interface intuitive and its vocabulary practice accessible. However, these studies primarily focus on students' perceptions or involve older learners, such as high school and university students. There remains a lack of empirical research that specifically investigates how Duolingo improves vocabulary mastery in elementary school students.

Ultimately, this research contributes to the broader discourse on technology-enhanced language learning and supports the development of innovative teaching practices that are both effective and enjoyable for young learners. The main point of this study is to investigate whether the use of the Duolingo application can significantly improve vocabulary mastery among fourth-grade elementary students, as measured through quantitative data such as pre-test and post-test scores. This study emphasizes not just student perceptions, but real, measurable vocabulary gains in a primary school context.

## **RESEARCH METHOD**

This study applied a quantitative research approach, which is appropriate for examining relationships and testing hypotheses using numerical data and statistical analysis (Creswell, 2012). The research design used was a pre-experimental one-group pre-test and post-test model. This design involves measuring a single group before and after a treatment to determine the effect of the intervention (Sugiyono, 2015) This method was chosen to evaluate the impact of the Duolingo application on students' vocabulary mastery in a controlled classroom setting.

The participants in this study were 20 fourth-grade students at SDIT AWH Ciganjur. They were selected using purposive sampling, a technique in which participants are chosen based on specific characteristics relevant to the objectives of the study (Etikan, Musa, 2016) The selected students had similar levels of English proficiency and access to digital devices, which supported the implementation of the Duolingo application. The Treatment Was Conducted Over Four Weeks with A Total Of Eight Sessions. Each Session Lasted Approximately 45

Minutes, During Which Students Practiced Vocabulary Using the Duolingo Application Under Teacher Supervision and Guidance.

The instrument used to collect data was a vocabulary test consisting of multiple-choice and short-answer items. Tests are widely used tools in educational research to assess students' knowledge, skills, and learning outcomes (Brown, 2004) In this context, vocabulary tests effectively measure the students' knowledge of word meanings, usage, and retention (Read, 2000) The test was administered before and after the use of Duolingo to determine the difference in vocabulary mastery.

To analyze the collected data, the researcher used descriptive statistics and a paired sample t-test. The paired sample t-test is suitable for comparing two sets of scores from the same participants at two different times to determine whether the mean difference is statistically significant (Pallant, 2011) This analysis was conducted using SPSS software to ensure the accuracy and reliability of the findings.

## FINDINGS AND DISCUSSION

The findings of this study reveal a statistically significant improvement in students' vocabulary mastery after using the Duolingo application. The vocabulary test was conducted twice: as a pre-test and post-test. The average scores and standard deviations are presented in Table 1.

**Tabel 1.** Mean Score of Pre-Test and Post-Test

<b>Test Type</b>	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>
Pre-Test	20	62.25	7.89
Post-Test	20	84.25	6.45

*Source:* Author's result

As shown in Table 1, the average vocabulary score increased from 62.25 in the pre-test to 84.25 in the post-test. The standard deviation indicates relatively consistent performance across both assessments.

**Table 2** Result of Paired Samples T-Test

<b>Pair</b>	<b>t</b>	<b>df</b>	<b>Sig. (2-tailed)</b>
Post - Pre	9.876	19	0.000

*Source:* Authors' results.

Table 2 presents the results of the paired sample t-test. The significance value of 0.000 indicates that there is a statistically significant difference between students' vocabulary mastery before and after using the Duolingo application ( $p < 0.05$ ). These results are in line with previous studies. Suci (2022) found that 70% of students felt Duolingo helped them learn vocabulary more easily and enjoyably. Jaelani & Sutari (2020) also reported that Duolingo improved students' vocabulary through interactive tasks and continuous exposure to new words. Razikna (2023) highlighted that Duolingo's user-friendly design and game-like format increased students' motivation and confidence in learning English vocabulary.

In this study, students demonstrated more enthusiasm and consistency in completing vocabulary tasks when using Duolingo. The interactive features such as audio, repetition, and feedback supported different learning styles and reinforced word retention. Furthermore, the gamified approach reduced students' anxiety and made the learning process more enjoyable.

This study strengthens the argument that game-based digital tools can enhance vocabulary learning, especially among young learners who require high engagement and repeated exposure to remember new words. Although Duolingo was originally developed for older learners, its structure and visual elements make it adaptable for primary school students, provided that teachers give proper supervision and guidance.

Therefore, integrating Duolingo into the language learning curriculum may serve as an effective supplementary tool. However, it should not entirely replace traditional methods, but rather support and enhance them. Teachers are encouraged to combine digital tools like Duolingo with communicative, classroom-based activities to maximize learning outcomes.

## CONCLUSION

This study concludes that the use of the Duolingo application has a significant positive impact on students' vocabulary mastery. The pre-test and post-test results showed a notable improvement in students' vocabulary scores after using Duolingo. This indicates that game-based digital tools such as Duolingo can enhance vocabulary learning outcomes, particularly among fourth-grade elementary students. The gamified features, interactive exercises, and engaging interface contributed to greater motivation and vocabulary retention.

The implication of this research is that educators, especially in primary schools, can integrate Duolingo as a supplementary tool to support vocabulary instruction. When used alongside traditional methods, Duolingo can help create a more enjoyable and effective learning environment for students. Schools and teachers are encouraged to explore other interactive platforms that align with the digital learning preferences of today's learners.

However, this study has several limitations. The sample size was relatively small, and the research was limited to a single class in one school. The study did not involve a control group or extended observation to assess long-term retention. Additionally, the focus was restricted to vocabulary skills without exploring other language components such as grammar or speaking ability.

For future research, it is suggested to conduct studies with larger and more diverse participant groups, and to include comparison groups or control classes. Future studies may also examine the effect of Duolingo on other language skills and investigate how different features of the app influence specific learning outcomes. Longitudinal studies could also provide insight into the long-term effectiveness of digital learning tools.

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