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The Effect of Using Duolingo on English Vocabulary Mastery Among Ninth Grade Students at SMP 16 Medan

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Abstract

The low mastery of English vocabulary among ninth-grade students at SMP Negeri 16 Medan became the main problem in this study, as reflected in the students' difficulties in understanding, remembering, and using vocabulary appropriately in communication contexts. This study aims to evaluate the effectiveness of the Duolingo application in improving students' vocabulary ability. This study employed a quantitative method, with data collected through a pre-test and a post-test, which were then analyzed using SPSS through a paired-samples *t*-test. The results showed that the students' mean score increased from 59.87 on the pre-test to 72.57 on the post-test, with a significance value of 0.000, which was lower than 0.05. These findings indicate that the use of the Duolingo application had a significant effect on improving the students' mastery of English vocabulary. Thus, this study confirms that the use of digital learning media can be an effective alternative for supporting the improvement of students' vocabulary ability in English language learning.

Keywords: Duolingo Application; Vocabulary Mastery; English Language Learning; Digital Learning; Junior High School Students

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INTRODUCTION

Education, technology, research, and worldwide communication are some of the most important areas of modern global civilization where English is spoken.As a medium of international communication, English is the principal language that is required for mastery on a global scale (Chairina, 2019, as referenced in Sari, 2024). The development of communication technologies has made English an essential tool for promoting direct interaction between people of different cultural backgrounds (Handayani, 2016). In this regard, English is vital in many spheres of life when dealing with global concerns. International transportation, television, sports, music, and digital communication all heavily utilize English, further solidifying its position as a dominant language in worldwide contacts (Balla, 2016).

According to (Balla, 2016), English has developed into a lingua franca, bringing together speakers of other languages. A lingua franca is defined as a community language that allows speakers of different languages to understand and use one another. As a result, millions of students in a variety of countries are studying English for many reasons, including academics, careers, and social involvement.

English is often considered a foreign language in Indonesia. However, it holds a significant and noteworthy position in Indonesia and in the daily lives of our people. The impact on the teaching of Indonesian as a foreign language is striking. From elementary school all the way up to university, pupils study English (Waduwu, 2016). This means that English is important in many fields, including education, and is not limited to only being a language for communication. Education, economics, the media, and the professional realm are just a few of the many areas where English is widely used (Alrajafi, 2021).

No matter if it's a first, second, or foreign language, the most important part of learning a new language is expanding one's vocabulary. It is well-known that expanding one's vocabulary is the first and most important step in mastering a language.

A collection of terms is what the Great Dictionary of the Indonesian Language calls a vocabulary. Vocabulary research, according to (Webb & Nation, 2017), includes words and their definitions; words are mostly used for communication; and they can be both

spoken and written. Webb & Nation, (2017) who states that a language's vocabulary includes all of its terms. All words used by readers, writers, and listeners are part of vocabulary.

Vocabulary is an essential element of the knowledge required for learners to attain proficiency in a language. An individual's linguistic proficiency is affected by their vocabulary breadth, both in spoken and written forms (Sari & Pandiangan, 2021). Vocabulary knowledge is the bedrock of second language acquisition and an essential component of communicative competence, according to (Alqahtani, 2015). Consequently, schools should prioritize vocabulary development as the primary goal of English language instruction, particularly at the junior high school level while pupils are still in the foundational phase of language acquisition.

Although vocabulary mastery is essential for learning English, numerous junior high school students continue to face challenges in properly acquiring English vocabulary.The considerable effect of students failing to master their learning objectives is attributable to their restricted vocabulary, stemming from their reluctance to seek knowledge and their indolence in consulting dictionaries, despite the acknowledged efficacy of dictionary use in enhancing vocabulary. Utami and Zuhdi (2020) assert that students frequently perceive learning English as challenging due to its absence in daily speech, leading to the belief that English is difficult. As cited in.

Students in the ninth grade at SMP Negeri 16 Medan have a hard time with English vocabulary. Based on initial observations and conversations with the school's subject teachers, it appears that the majority of students struggle with and have little proficiency in English. The significance of new terminology and how to use it correctly in context were frequently challenges for students. When pupils' results for language acquisition are below the Minimum Mastery Criteria (MPS), it's clear that something is wrong.The issue of inadequate vocabulary acquisition among students at SMP Negeri 16 Medan calls for a fresh approach to education that aligns with the traits of contemporary learners, especially in the realm of digital learning.

Even ninth graders at SMP Negeri 16 Medan expressed worry about their English vocabulary. Based on initial observations and conversations with English teachers at the

school, it seems that the majority of students have inadequate English comprehension skills. It can be difficult for students to grasp the significance of new terminology and know how to use it correctly in different situations. Students' failure to meet the required learning outcomes in language classes is demonstrated by their scores that routinely fall short of the Minimum Passing Score (MPS).A well-designed digital learning environment, according to (Wiseman et al., 2016), can increase student engagement through the provision of engaging, interesting, and suitably difficult learning activities.

Digital educational resources are becoming more popular and accessible due to the proliferation of the internet. Researchers have discovered that digital learning strategies are used in various ways to improve transmission efficiency and expand application, which is great news for students and teachers alike. The general public owns and uses mobile phones and other handheld gadgets on a regular basis, and these technologies are growing rapidly. In the digital age, technology is expected to be used as a tool for learning (Lin et al., 2017; Azis, 2019).

Previous research has concluded that Duolingo is an excellent tool for improving one's language skills—particularly vocabulary—through self-directed learning that leverages technology. (Putri et al., 2026; Li & Bonk, 2025). According to their research, using Duolingo regularly can greatly enhance language proficiency. The app's interactive exercises, gradual challenges, and rapid feedback make learning fun and motivating. Duolingo is a great tool for helping junior high school students at SMP Negeri 16 Medan improve their English vocabulary because it follows the principles of a digital learning environment that focuses on adaptability, participation, and student-centered teaching.

METHODS

This study employed a quantitative approach with a quasi-experimental design, specifically a one-group pre-test and post-test design (White, 2020; Qudratuddarsi et al., 2024). The study was conducted at SMP Negeri 16 Medan from January to February of the 2024/2025 academic year. The research subjects were ninth-grade students, with a sample of 30 students selected using cluster sampling, in which an entire class served as the experimental group. The research instruments used included vocabulary tests in the form of pre-tests and post-tests consisting of 20 multiple-choice questions to

measure students' initial and final abilities after the intervention. Additionally, a questionnaire was used to determine students' responses and motivation regarding the use of the Duolingo app. Data collection was conducted in several stages (Jailani, 2023): (1) the preparation stage, involving the development of instruments and coordination with teachers; (2) the pre-test stage to measure initial proficiency; (3) the treatment stage, involving the use of the Duolingo app in instruction; and (4) the post-test stage to measure improvements in students' vocabulary proficiency following the intervention. Data analysis was conducted quantitatively using a paired-sample t-test with the assistance of SPSS version 25 (Aida et al., 2025). This analysis aimed to identify significant differences between pre-test and post-test results. Additionally, the data were analyzed using descriptive statistics such as the mean, standard deviation, minimum, and maximum values to provide an overview of the research findings. This study also addressed ethical considerations by maintaining the confidentiality of respondents' data and ensuring that student participation was voluntary through informed consent.

RESULTS

Data Description

This study investigated the impact of Duolingo on the vocabulary skills of ninth-grade students at SMP Negeri 16 Medan. The students administered pre- and post-assessments.

The students utilized the Duolingo app as a digital educational tool aimed at enhancing vocabulary acquisition through the integration of games in each learning session. Prior to employing this method, pupils generally acquired knowledge through traditional classroom techniques.

Classroom exams focused on vocabulary competency via multiple-choice questions. The test papers used for the pre- and post-tests were identical. Classroom exams focused on vocabulary competency via multiple-choice questions. The test papers used for the pre- and post-tests were identical.

Because the use of Duolingo is tailored to the skills of ninth graders, the provided material is both relevant and understandable. The vocabulary assessment questions are part of the research tools that are included in this study.

Pretest and Posttest Results

The purpose of the pre-test was to determine the students' level of vocabulary competency before they used the Duolingo program. The students' vocabulary was severely lacking before the intervention. The students took a post-test to see how much they had improved their vocabulary after many intervention sessions. Thirty ninth graders took a vocabulary test consisting of twenty multiple-choice questions.

Table 1. Score Results

Name	L/P	Pre-test	Post-test
AA	L	67	75
AP	P	48	74
RA	L	58	73
SA	P	65	75
AD	P	64	71
MH	P	60	74
TM	L	70	73
AC	P	64	67
NS	P	54	80
TA	P	54	77
AS	L	65	71
RS	L	58	72
DMS	P	53	80
MT	L	66	66
ZH	P	52	65
SD	P	64	69
NH	P	53	74
MA	L	64	71
GI	L	63	71
FH	P	65	75
FFR	L	71	73
AH	L	58	72
ADP	L	52	73
DA	L	53	75
FFR	L	60	60
MR	L	54	77

Name	L/P	Pre-test	Post-test
KAY	P	48	73
PF	P	62	70
HMP	L	65	71
FR	L	66	80

Descriptive Statistical Analysis Results

This study aims to assess the vocabulary size of students prior to and subsequent to utilizing the Duolingo application. The table below displays students' scores prior to and subsequent to the test. The data distribution also include the minimum, maximum, mean, and standard deviation.

Table 2. Statistical Analysis Results

N		Minimum	Maximum	Mean	Std. Deviation
Pretest	30	48	71	59.87	6.437
Posttest	30	60	80	72.57	4.384
Valid N (listwise)	30				

Hypothesis Testing

This research used a paired-sample t-test to determine whether there is a statistically significant difference between the students' pre- and post-test results.

Table 3. Results of Hypothesis Testing Using SPSS

Paired Samples Test

Paired Differences							T	Df	Sig. (2-tailed)
Mean			Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pretest - Posttest	-12.700	8.466	1.546	-15.861	-9.539	-8.217	29	.000

Students' post-test scores went above and above their pre-test scores prior to using Duolingo, as seen in Figure 3.1 of the test results. After the exam, the average score increased from 59.87 to 72.57.

Results from the paired-sample t-test are statistically significant (p-value = 0.000, significance level = 0.05). As a result, we accept Ha as true and reject H0, the null

hypothesis. The results show that pupils' vocabulary growth is significantly affected by the Duolingo program. The results show that with the help of the Duolingo software, ninth graders at SMP Negeri 16 Medan increased their vocabulary.

DISCUSSION

This study demonstrates that the Duolingo program can markedly enhance students' English vocabulary ability. Post-intervention scores improved relative to pre-intervention scores. The results demonstrate that the utilization of digital learning aids can enhance student learning outcomes.

Alqahtani (2015) asserts that vocabulary mastering is essential for language acquisition, hence facilitating students' ability to utilize and comprehend the language.Insufficient language proficiency will hinder students' comprehension of the topic and their ability to communicate effectively. Webb & Nation, (2017) assert that vocabulary mastery significantly impacts the success of language acquisition.

This study concluded that utilizing the Duolingo app enhances interactivity and enjoyment in the learning process for pupils. This corresponds with Taufik Azis's (2019) assertion that educational technology is essential for enhancing learning quality in the digital era. Furthermore, (Lin et al., 2017) assert that mobile-based learning can enhance student engagement in the educational process.

Students exhibit increased engagement and motivation while use Duolingo. Students exhibit a heightened interest in acquiring language via game-based learning mechanisms. Kurniawan et al. (2022) asserts that games in language acquisition might enhance students' motivation and engagement in the learning process.

This study aligns with the findings of Radoslav Vesselinov and John Grego 2012, who demonstrated that the Duolingo program facilitates language learning, including vocabulary acquisition, through quick feedback and repetitive practice. Consequently, it can be inferred that the utilization of the Duolingo app as a digital learning instrument positively and significantly impacts students' vocabulary development. Moreover, these results align with prior studies suggesting that technology utilization in education might improve the learning experience and student involvement.

Nathaniela and Esfandiari (2024) assert that technology-based learning provides many methodologies and facilitates students' access to interactive and online education." This enables students to acquire extensive knowledge, enhance their comprehension of the content, and access larger opportunities in the learning process.

The findings of this study indicate that the use of the Duolingo application significantly improves students' vocabulary mastery. This implies that teachers can effectively integrate digital learning tools as an alternative or complement to conventional teaching methods. The use of mobile-based applications promotes higher student engagement, motivation, and learning outcomes through interactive and enjoyable learning experiences, particularly in English language instruction at the junior secondary level.

This study has several limitations, including the relatively small sample size limited to one class and the use of a one-group pretest–posttest design without a control group, which restricts the generalizability of the findings. In addition, the short duration of the study may not fully capture the long-term effects of the intervention. The study also focuses solely on vocabulary mastery and does not address other language skills, while external factors influencing students' performance could not be entirely controlled.

CONCLUSION

Students in ninth grade at SMP Negeri 16 Medan improved their vocabulary skills after using Duolingo, according to the data analysis and discussion in the previous chapter. Students' post-test scores are much higher than their pre-test scores, according to statistical studies. "Results show that the post-test scores are higher than the pre-test results.Improved vocabulary is a result of increased use of Duolingo. The hypothesis testing yielded a significance criterion lower than 0.05. This research provides strong evidence that using Duolingo is beneficial. Hence, it's reasonable to assume that students learn new words more effectively when they use Duolingo as a digital learning platform since it's more fun, dynamic, and engaging.

This study contributes to the field of English language education and educational technology by providing empirical evidence supporting the effectiveness of digital

applications, particularly Duolingo, in enhancing vocabulary acquisition. It also reinforces the theoretical foundation of mobile-assisted language learning (MALL) and highlights the role of gamified learning environments in improving student engagement and achievement in formal education settings.

Future researchers are recommended to employ more robust research designs, such as quasi-experimental studies with control groups, and involve larger and more diverse samples to enhance the generalizability of the findings. Further studies should also consider longer intervention periods to examine long-term effects, explore other language skills such as speaking, listening, and writing, and investigate the effectiveness of combining Duolingo with other instructional approaches to achieve more comprehensive learning outcomes.

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