

The Effectiveness of Duolingo in Improving English Vocabulary Achievement among EFL Students at SMA Mambaus Sholihin 2 Blitar

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Abstract

This research aim to identify the teaching strategy was used by teacher in motivating students to learn English vocabulary. The researchers investigated the effectiveness of Duolingo in Improving English Vocabulary Achievement among EFL Students at SMA Mambaus Sholihin 2 Blitar. It was conducted in one class of senior high school with consist of thirty-two students. This research applied a pre-experimental research design that was one group pretest and posttest. while the data that were derived from qualitative and quantitative data. the result showed that students' mean score enhance from 61.15 up to 77.25. The hypothesis was analyzed at the significant level of 0.05, and the result showed that t-value was 16.10 and the sig.2-tailed 0.000. It means that hypothesis was accepted and found that Duolingo Application can be used in vocabulary teaching. Studies have shown that using Duolingo can lead to increased vocabulary scores and enhanced English language proficiency, suggesting that the application's features, like interactive lessons and point-based progress, can give motivation and engagement for English vocabulary achievement in classroom. Duolingo Application has motivated the students to practice of a foreign language by phone or computer easily. Overall, the study suggest that Duolingo is a game application that can be a valuable tool for enhancing their new vocabularies in the context at SMA Mambaus Sholihin 2 Blitar, potentially by boosting motivation and promoting consistent learning habits

INTRODUCTION

English is now widely taught in schools, from elementary to higher education. While instructional frameworks predominantly emphasize the development of the four core macro skills—listening, speaking, reading, and writing—proficiency in these areas is intrinsically contingent upon a robust grasp of foundational linguistic elements. Research with students at SMA Mambaus Sholihin 2 in Blitar shows that a limited vocabulary is a major obstacle to improving their English. Most students were unable to respond to questions in English and

frequently requested that the teacher restate the questions in Indonesian to facilitate understanding. They also encountered difficulties in retaining newly learned vocabulary and producing accurate pronunciation. Furthermore, vocabulary learning in the classroom was not optimally supported, as the instructional process continued to rely on conventional teaching approaches that tended to reduce student engagement. The the teacher limited integration of innovative teaching methods and learning media in vocabulary instruction further constrained students' learning experiences. As a result, a considerable number of students were unable to achieve satisfactory performance on the vocabulary assessment.

To overcome the issues highlighted above, the researcher employed an interactive game to enhance students' achievement in English vocabulary. One of the instructional media employed in this study was a Computer-Assisted Language Learning (CALL) application, a technology-based tool designed to facilitate English vocabulary acquisition. The advancement of digital technology has brought substantial changes to language education, creating new opportunities for more effective and interactive learning experiences. According to Levy (1997), Computer-Assisted Language Learning (CALL) refers to the application of computer technology in supporting both language teaching and learning processes. Through CALL, learners are able to access learning resources independently and engage in various interactive activities that promote language development.

In a similar vein, Chapelle (2001) emphasizes that technology enhances language learning by offering immediate feedback, authentic learning materials, and meaningful opportunities for interaction. These characteristics contribute to a learning environment that is not only more flexible but also increasingly centered on learners' individual needs and learning preferences. Hatch and Farhady (1982) maintain that the integration of technology can support a more structured and systematic learning process. Technology-based learning environments enable students to track their learning progress while benefiting from instructional experiences that can be adapted to their specific needs and abilities. As digital devices become more prevalent in everyday life, particularly smartphones and mobile technologies, the ways in which students learn languages have also evolved considerably. Supporting this view, Hwang and Wu (2014) found that mobile technology has the potential to enhance learners' motivation and active participation in language learning. The accessibility of learning materials at any time and from any location provides students with greater opportunities to practice and reinforce their language skills beyond the classroom setting.

Furthermore, mobile learning fosters greater learner autonomy by enabling students to assume a more active role and increased responsibility in managing their own learning processes. As a result, students can develop language skills more consistently through regular practice. Clark (2013) also notes that technology-based learning environments provide interactive and accessible resources that support vocabulary development. These resources encourage students to learn independently while maintaining their interest in the learning process.

Drawing on the previous discussion, this study is designed to examine the effectiveness of the Duolingo application in enhancing students' English vocabulary achievement. In addition, it also explores how vocabulary instruction is implemented in the classroom when

Duolingo is integrated as a learning medium, particularly in terms of teaching practices and classroom use.

Vocabulary is widely viewed as a core element in language learning, as it significantly contributes to learners' overall proficiency. When learners lack adequate vocabulary knowledge, their ability to comprehend spoken or written messages becomes limited, and they may also experience difficulties in conveying their thoughts clearly and accurately. McCarthy (1990) emphasizes that vocabulary serves as the foundation of communication because words are the primary tools used to convey meaning. Therefore, students need to develop a rich vocabulary to support their language learning process.

In addition, Nation (2001) states that vocabulary knowledge plays a crucial role in second language acquisition. Learners who possess a larger vocabulary are generally able to understand texts more easily and communicate their thoughts more confidently. As vocabulary size increases, students become more capable of using the target language in both academic and everyday situations. Furthermore, Taylor (1992) emphasizes that vocabulary acquisition should extend beyond the mere memorization of word meanings. Instead, learners require consistent and repeated exposure to lexical items within meaningful contexts to develop a deeper understanding of how these words function in authentic communication. Such sustained exposure also contributes to better retention of vocabulary over an extended period.

Similarly, Schmitt (2000) explains that knowing a word involves more than understanding its definition. Learners should also be familiar with its pronunciation, spelling, grammatical function, and appropriate usage in different contexts. For this reason, vocabulary instruction should provide opportunities for students to encounter and practice words in various ways. Neuman and Dwyer (2009) further highlight that effective vocabulary instruction contributes significantly to students' literacy development. Students with stronger vocabulary knowledge tend to achieve better reading comprehension and overall academic performance. Duolingo has become a popular choice among language learners due to its unique combination of education and entertainment. The application integrates gamification principles, including rewards and structured challenges, to foster a more engaging learning environment and encourage consistent learner participation.

Gamification itself refers to the incorporation of game-design elements into non-game settings to enhance user engagement and motivation (Deterding et al., 2011). In Duolingo, features such as experience points, leaderboards, and streak systems are strategically implemented to sustain learners' motivation and promote continuous practice. From a pedagogical perspective, Duolingo also applies the principle of spaced repetition, a technique in which newly learned and more challenging vocabulary items are reviewed at systematically increasing intervals. This approach has been widely recognized for its effectiveness in strengthening long-term memory retention, making it a crucial component of the application's design in supporting vocabulary acquisition.

Duolingo is recognized as one of the most extensively utilized language-learning applications worldwide, with a broad user base across different educational contexts. According to Jaskova (2014), Duolingo combines language instruction with gamification features to create

an engaging learning experience. The application offers various activities that help learners develop vocabulary, grammar, reading, listening, and speaking skills. Munday (2016) reported that the integration of Duolingo into language learning settings has the potential to enhance students' motivation as well as their active participation in the learning process. Students generally perceive the application as enjoyable and helpful because it allows them to practice language skills in an interactive way. One of the strengths of Duolingo is its use of repetitive practice. Munday (2016) explains that repeated exposure to vocabulary items helps learners remember new words and improve retention. Through continuous practice, students gradually strengthen their vocabulary knowledge. Furthermore, Vesselinov and Grego (2012) reported that learners who regularly used Duolingo demonstrated significant improvements in language proficiency. Their findings suggest that the application can be an effective supplementary tool for language learning, particularly in vocabulary development.

Duolingo is a software that aids users in learning and mastering language, including reading, writing, listening, and speaking. Students engage in a range of activities during their learning process, including answering questions and reading passages, completing affirmative and negative sentences, listening to audio recordings (such as videos), and transcribing what they hear. The app enables learners to record their own voices and use them to practice and assess their pronunciation and speaking skills. With Duolingo, language learning becomes a fun and engaging activity that's designed to be like or feel. Students can access a range of languages for free and learn at their own pace by improving their vocabulary, grammar, and communication skills. Duolingo also provides detailed learning statistics, including points earned, lessons completed, course progress and daily learning streaks.

One of the most widely used language learning platforms is Duolingo, a game-based platform that offers engaging experiences. Its interactive nature makes language learning fun and effective for both teachers and students. Many educators, parents, and learners use Duolingo in classrooms as well as at home to help with language development. This is a motivating process. The classroom can benefit from the implementation of Duolingo: Head to the Duolingo for Schools website and click on "Get Started.". When logged in, your dashboard will be blank.' Choose "Add to Classroom" to create a new class. Choose a domain name for your classroom and pick the language you're teaching. The dashboard displays a classroom tile, which is visible after the classroom has been set up. Select the option "Invite Students" to create a link inviting your students over. Send the invitation link to your students to join the classroom.? Students are required to read the link provided by the teacher, which is typically sent via email or another means. The notification pops up, and students must click the "Continue" button to proceed. Registration and the start of learning are now possible for students on Duolingo. Students can modify their privacy settings and/or share preferences by accessing the Settings menu on the blue navigation bar at the top. The settings menu provides students with the option to select "Progress Sharing" and view their learning progress in a classroom-sharing feature.

According to Munday (2016), the desktop version of Duolingo offers several features that support language learning in an engaging and interactive way. First, the **Skill Tree** provides a structured learning path for each language, beginning with basic concepts and gradually

introducing more advanced skills as learners progress. Second, the **Words** section contains a collection of vocabulary that users have learned or previously known. Each vocabulary item is presented with a strength indicator that reflects the level of retention in the learner's memory and determines the appropriate timing for review according to Duolingo's algorithmic system. In addition, learners are provided with opportunities to reinforce their vocabulary knowledge through the use of flashcard-based practice activities.

Another feature is **Activity**, which functions similarly to a social networking platform, allowing users to follow other learners and share their learning progress. The **Discussion** area enables users to interact with one another by posting topics of interest or discussing questions related to lesson activities, encouraging collaborative learning and meaning negotiation. For more advanced learners, the **Immersion** feature provides opportunities to translate real-world documents uploaded by the community, helping users apply their language skills in authentic contexts. Finally, the **Lingot Store** uses a virtual currency called *Lingots* to motivate learners. Users earn Lingots by completing lessons, maintaining learning streaks, or receiving rewards from other users in discussions. Through these features, Duolingo contributes to the development of learners' language competencies, encompassing vocabulary acquisition, grammatical understanding, and overall communicative performance.

One of its notable advantages lies in its motivational design, where gamified features, instant feedback, and short-term daily objectives work together to maintain learner engagement. Previous studies indicate that although the learning gains may be relatively moderate, users tend to demonstrate sustained engagement over time, which gradually supports long-term language development.

This study seeks to investigate the effect of the Duolingo application on learners' English vocabulary achievement. The findings are expected to offer meaningful contributions for both teachers and students, particularly within the local educational context, while also enriching the broader discourse on technology-enhanced language learning in Indonesia. Nevertheless, the effectiveness of the application is influenced by several factors, including learners' prior knowledge, motivation levels, and frequency of use. In addition, its emphasis on short, repetitive exercises may not fully develop learners' ability to apply vocabulary in more complex spoken or written contexts. Therefore, although Duolingo provides valuable support, it should not be considered a standalone solution, but rather as a complementary tool to traditional classroom instruction.

METHOD

This study adopted a pre-experimental research design, specifically a one-group pretest–posttest approach, to investigate the effect of the Duolingo application on students' English vocabulary achievement. According to Donald T. Campbell and Julian C. Stanley (1963), the one-group pretest–posttest design involves administering a pretest before the treatment and a posttest after the treatment to measure changes that occur as a result of the intervention. The study was conducted over six meetings within three weeks during one semester. The design of the study is illustrated as follows:

$T_1 \times T_2$

Where:

- T_1 = Pretest (administered before the treatment)
- X = Treatment (the implementation of the Duolingo application)
- T_2 = Posttest (administered after the treatment)

The difference between the pretest and posttest scores was utilized to determine whether the implementation of the Duolingo application had a positive effect on students' English vocabulary achievement.

The participants of this study were first-grade students at SMA Mambaus Sholihin 2 Blitar, with one class consisting of 32 students selected as the research sample. In the initial meeting, a pre-test was administered to measure the students' baseline vocabulary knowledge. The test comprised 30 multiple-choice items and was allocated 90 minutes for completion. Subsequently, in the second meeting, the researcher implemented the first treatment by introducing the Duolingo application as a learning medium. This instructional treatment was continued in the third, fourth, and fifth meetings, during which students engaged in vocabulary learning through Duolingo's interactive and game-based features. In the final meeting, a post-test was administered to evaluate students' vocabulary achievement after the intervention. The post-test followed the same format as the pre-test, consisting of 30 multiple-choice questions with a duration of 90 minutes.

To collect the data, the researcher followed several procedures. First, the population and sample were determined. After that, the researcher selected and prepared the learning materials, administered a pre-test to identify the students' initial vocabulary ability, and recorded the results. The treatment was then conducted using the Duolingo application. After the treatment sessions were completed, a post-test was administered to measure the students' vocabulary achievement. In addition, several questions were given to the students to obtain qualitative data regarding their opinions and experiences of using Duolingo both inside and outside the classroom. The final step was analyzing all collected data.

For the qualitative data, the researcher gathered students' responses about their perceptions of learning vocabulary through the Duolingo application. For the quantitative data, a repeated-measures t-test was employed to compare the students' vocabulary scores before and after the treatment. According to Hatch and Farhady (1982, p. 108), the t-test is one of the most commonly used statistical tests for comparing two means and can be applied even with relatively small sample sizes. The research instrument was also tested for validity and reliability. Construct validity was used to ensure that the instrument measured the intended concept, while inter-rater reliability was applied to ensure consistency in scoring.

After all data had been collected, the researcher analyzed them to determine whether the use of the Duolingo application improved students' vocabulary achievement. The repeated-measures t-test was used to examine the effect of the treatment by comparing the pre-test and post-test scores. The hypotheses of the study were formulated as follows: **H₀ (Null Hypothesis)**: There is no significant difference in students' vocabulary achievement before and after being taught using the Duolingo application. **H₁ (Alternative Hypothesis)**: There is a significant difference in students' vocabulary achievement before and after being taught using the Duolingo application. The decision criteria were based on the significance level ($\alpha = 0.05$). The null hypothesis (H_0) was accepted if the significance value was greater than 0.05 ($p > 0.05$), while the alternative hypothesis (H_1) was accepted if the significance value was less than 0.05 ($p < 0.05$).

FINDINGS AND DISCUSSION

This section presents the research findings related to the instructional strategies applied by the teacher in facilitating and motivating students' English vocabulary learning. The data were obtained from students' responses to a questionnaire, and the results of their satisfaction levels are presented in Table 1.

Table 1. The Results satisfaction for Students

The findings show that most students had positive experiences with Duolingo. By

Statements	Strongly Agree (%)	Agree (%)	Neither Disagree nor Agree (%)	Disagree (%)	Strongly Disagree (%)
Duolingo was perceived as easy to use and beneficial	55.2	36.1	5.2	2.1	1.4
Duolingo was helpful in studying English	48.6	31.9	10.4	6.3	2.8
Students enjoyed and felt satisfied when learning English through the application	47.8	32.6	9.7	6.5	3.4
Duolingo was considered capable of enhancing students' English vocabulary achievement.	44.9	33.4	11.2	7.1	3.4

combining the *Strongly Agree* and *Agree* responses, it can be seen that 91.3% of the students found the application easy to use. In addition, 80.5% felt that Duolingo was useful for learning English, while 80.4% reported that they enjoyed using the application and were satisfied with their learning experience. Moreover, 78.3% believed that Duolingo helped improve their English vocabulary achievement. Only a few students expressed negative opinions, indicating that the application was generally accepted and appreciated by the majority of participants. Based next Question 'Will you continue using Duolingo in the classroom?' table 2 shown their answer.

Table 2. Students' respond after using Duolingo application

"Will you continue using Duolingo in the classroom?"			
Opinion	Yes	No	Maybe
Students	70. %	10, %	20%

Although the majority of students did not participate in additional learning sessions, the data presented in the table indicate that more than 70% of the class responded positively. These results imply that students demonstrated a high level of interest in learning vocabulary through the Duolingo application during classroom activities. Moreover, the quantitative analysis

conducted using an independent t-test showed a significant improvement in students' English vocabulary achievement after the implementation of the application. This improvement is reflected in the increase of the mean score from 61.15 in the pretest to 77.25 in the posttest, indicating a gain of 16.10 points.

This research requires more than three treatment sessions to significantly enhance students' English vocabulary achievement. The pretest was conducted to measure the baseline quality, and the results were used to determine which items should be revised.

After the pretest was completed, the researcher carried out four treatment sessions using the Duolingo application. Throughout these sessions, the students showed a strong interest in the learning activities and appeared enthusiastic about the materials being presented. The application was introduced step by step so that students could easily understand how to use it.

During the first treatment session, the researcher introduced Duolingo and explained its function as a tool for learning English. To help students become familiar with the application, the researcher demonstrated how it worked by displaying it on an LCD screen and completing several example activities. Students were invited to participate by answering the questions provided in the application, while unfamiliar words were discussed and translated together.

After the demonstration, students were asked to access Duolingo using their own smartphones or laptops. Those who did not have a device were encouraged to work with a partner. Once everyone was ready, the researcher explained the basic rules and procedures for using the application, ensuring that all students understood how to complete the learning activities. This initial session helped students become comfortable with Duolingo and prepared them for the following treatment sessions.

During the second meeting, the researcher instructed the students to start using the Duolingo application. The students worked on various vocabulary activities and attempted to answer questions related to new words presented in the game. They were required to complete each level within seven minutes to help them stay focused on the tasks. At the end of the session, the researcher announced the student who achieved the highest score on Duolingo and then provided an evaluation of the learning activities. Throughout the lesson, the students showed great enthusiasm and actively participated in the teaching and learning process.

In the third treatment session, the researcher informed the students that they would continue learning vocabulary through the Duolingo application. The students logged into their personal accounts and resumed the levels they had previously completed, aiming to achieve higher scores than before. During this meeting, each student was asked to use their own smartphone or computer so that they could work independently. This individual learning approach made the activities more enjoyable and engaging for the students. They became more active, motivated, and competitive in completing the tasks. The students also developed greater independence in learning as they explored and learned new vocabulary on their own. At the end of the session, the researcher assigned additional practice activities as homework to encourage further vocabulary development outside the classroom.

In the fourth treatment session, the researcher followed the same teaching procedures as in the previous meetings, starting from the opening activities and ending with the closing

session. The students logged into their individual Duolingo accounts and continued working on their assigned levels. To encourage active participation, the researcher set specific level targets and displayed the students' scores on the LCD screen. This created a competitive atmosphere, motivating the students to achieve higher scores than their classmates. Throughout the session, the researcher monitored the students' progress and moved around the classroom to observe their learning activities and provide support when needed.

Based on the treatments conducted in the classroom, the researcher analyzed the results and found that the students' vocabulary achievement improved. This improvement can be seen in the increase in the mean score from 61.15 on the pretest to 77.25 on the posttest, showing a gain of 16.10 points. The findings indicate that there was a significant difference in the students' English vocabulary achievement after they were taught using the Duolingo application.

Moreover, several previous studies have investigated the effectiveness of Duolingo in language learning. . Previous studies have shown that Duolingo can improve students' vocabulary mastery through mobile-assisted language learning activities (Syamsuddin et al., 2022). Besides, Duolingo supports self-directed language learning by enabling learners to study independently outside the classroom (Li & Bonk, 2025). Similarly, Shortt et al. (2023) found that gamification elements in Duolingo contribute positively to learners' motivation and language learning outcomes. Artificial intelligence-based language learning platforms can enhance language skills and learners' self-regulation abilities (Qiao & Zhao, 2023).

In another study, Additionally, Mobile language learning applications such as Duolingo can facilitate significant language gains and provide positive learning experiences for learners (Kessler et al., 2025).. Effective self-management plays an important role in maximizing the benefits of mobile language learning applications (Alghamdi, 2024). Clark (2013) also notes that technology-based learning environments provide interactive and accessible resources that support vocabulary development. These resources encourage students to learn independently while maintaining their interest in the learning process

The result showing that vocabulary can be regarded as a fundamental component of language learning. Adequate vocabulary knowledge enables learners to understand information, communicate effectively, and develop overall language proficiency. The literature also indicates that technology-based learning approaches, particularly mobile learning and CALL, can enhance students' motivation and learning outcomes. Moreover, previous studies have consistently shown that Duolingo is a useful learning tool that supports vocabulary development through interactive and gamified activities. Therefore, investigating the effectiveness of Duolingo in improving students' English vocabulary achievement is important for providing further evidence regarding its contribution to English language learning.

CONCLUSION AND IMPLICATIONS

The findings of this study reveal that the implementation of the Duolingo application is effective in improving English vocabulary achievement among EFL students at SMA Mambaus Sholihin 2 Blitar. Students who engaged in vocabulary learning through Duolingo showed significant improvement in acquiring new lexical items, comprehending their meanings, and applying them appropriately across various communicative contexts.. Their improvement was

greater than that of students who were taught using traditional learning methods. These findings suggest that technology-based learning platforms like Duolingo can make the learning process more interesting, interactive, and student-centered. By encouraging learners to practice independently while staying engaged, Duolingo provides a supportive environment for vocabulary development. This study also makes a meaningful contribution to the field of English Language Teaching (ELT) by underscoring the potential of digital learning tools in facilitating vocabulary acquisition, particularly for high school learners of English as a Foreign Language (EFL). Future research is encouraged to explore the long-term effects of Duolingo on other language skills, such as grammar, speaking, and listening, as well as to conduct comparative studies with other digital learning applications to determine relative effectiveness.

Furthermore, teachers are advised to integrate the Duolingo application as a supplementary resource for vocabulary instruction, both in classroom-based activities and in independent learning contexts, in order to enhance student engagement and participation. At the institutional level, schools are expected to ensure the availability of stable internet access and to provide digital literacy training, enabling students to utilize technology more effectively in language learning processes.

From a theoretical standpoint, the findings of this study reinforce the principles of Mobile-Assisted Language Learning (MALL) and constructivist learning theory, both of which emphasize learner autonomy, active engagement, interaction, and meaningful participation throughout the learning process. In addition, the study highlights the importance of incorporating gamified and self-paced learning strategies into vocabulary instruction to support more effective language learning outcomes.

Socially and ethically, Duolingo promotes equal access to quality education, particularly for students in underprivileged areas, while encouraging responsible use of digital resources in the classroom. On a policy level, education authorities and school leaders should integrate mobile learning platforms like Duolingo into English teaching and extracurricular activities, supported by teacher training, ICT infrastructure, and curriculum development.

Moreover, future researchers may examine whether the application can also contribute to the development of other aspects of language learning learner proficiency, and different age groups, as well as compare its effectiveness with other digital tools such as Memrise, Quizlet, or Babbel to enhance understanding of technology-enhanced language education.

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