

The Effectiveness of Duolingo Application on Vocabulary Mastery in English Language Learning of Grade 10 Students at SMK Al-Kautsar Sriwijaya

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Abstract: This study aimed to examine the effectiveness of the Duolingo application in helping 10th-grade students at SMK Al-Kautsar Sriwijaya master English vocabulary. This research is based on the understanding that vocabulary is a crucial foundation in English language learning, and Duolingo's potential as an innovative digital learning tool. Using a quantitative quasi-experimental method, we compared two groups of students: one group learned using Duolingo (the experimental group) and the other used traditional methods (the control group). The subjects of this study were all 10th-grade students at SMK Al-Kautsar Sriwijaya for the 2024/2025 academic year. Two classes were specifically selected (purposive sampling) to be the experimental and control groups. To measure vocabulary mastery, both groups were given a pre-test and a post-test. The collected data were then quantitatively analyzed using an independent t-test to determine the difference in average post-test scores between the two groups. The analysis results showed a significant difference in vocabulary mastery between students who used Duolingo and those who did not. The experimental group's average post-test score was significantly higher. This demonstrates that the Duolingo application is effective in improving students' English vocabulary mastery. Therefore, Duolingo can be recommended as an innovative and engaging vocabulary learning tool for use in schools.

Keywords: Duolingo, English Learning, Vocabulary Mastery

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1. Introduction

English, as the globally dominant language, plays a pivotal role in international communication and business, establishing itself as the essential lingua franca of the modern era. Consequently, mastering English is crucial, especially the speaking aspect, which directly correlates with communicative fluency. Achieving this fluency necessitates the comprehensive development of all four language skills: speaking, writing, reading, and listening.

English, the most widely spoken language in the world, plays an important role in international relations as a means of communication between countries. Lingua franca, the language commonly used for communication between communities, English is essential for global business transactions.

In language acquisition, students often prioritize vocabulary development, which, alongside grammar and pronunciation, forms the foundation of language proficiency. A robust vocabulary is vital not only for effective communication but also for personal growth; without adequate word comprehension, communication will be severely hampered. The significance of vocabulary is consistently emphasized across various learning contexts, from textbooks to classrooms. The more words students acquire, the better their overall understanding and language skills, including speaking, writing, and comprehension [1]. To communicate fluently in English, it's recommended to command a vocabulary of at least 2,000 words.

Given the critical role of vocabulary, particularly for English as a Foreign Language (EFL) learners, educators must discover effective and engaging teaching methods. However, research indicates that teaching vocabulary often presents challenges, with many teachers feeling uncertain about the most effective approaches. For instance, [2] observed that her students struggled to identify word types and tended to be disengaged in class. This highlights the need for continuous improvement in teaching methodologies to achieve higher quality learning outcomes, especially as teachers serve as "sources of knowledge" and students are increasingly motivated to seek information beyond the classroom [3].

Based on the researcher's teaching experience at SMK Al-Kautsar Sriwijaya, several specific challenges in vocabulary learning have been identified. Firstly, students struggle to apply learned vocabulary in sentences, often recalling only the meaning without understanding proper usage. The presence of numerous synonyms further complicates vocabulary application. Secondly, a lack of student focus in class is a significant issue. Learning predominantly driven by teacher explanations, without interactive activities, leads to passive students who lose concentration and struggle to absorb new vocabulary.

To overcome these obstacles, diversifying teaching techniques and media is highly recommended to make the learning process more enjoyable, particularly for vocabulary acquisition. Teachers, as key figures in educational institutions, significantly influence learning quality. Utilizing various media text, audio, video, and visual, including applications on digital devices like smartphones can make learning more engaging. Duolingo stands out as a relevant application, offering a comprehensive educational platform that intelligently integrates listening, reading, writing, vocabulary, grammar, and speaking practice [4].

Launched in 2012 by Luis von Ahn and Severin Hackers, Duolingo has become an immensely popular language learning app, used by millions worldwide. It provides interactive learning through a combination of visuals, audio, and grammar exercises, making it appealing to students due to its engaging and user-friendly features that enhance vocabulary, speaking, listening, and writing skills.

Prior research, such as "The Effect of Using Duolingo Application Through Students' Vocabulary Mastery" by Muhammad Faiq Zamzami [5] at MTs Negeri 3 Jakarta, employing a quasi-experimental method, demonstrated Duolingo's effectiveness in improving eighth-grade students' vocabulary mastery. Considering Duolingo's potential as an English vocabulary learning medium, this study aims to investigate "The Effectiveness Of Duolingo Application On Vocabulary Mastery In English Language Learning Of Grade X Students At Smk Al-Kautsar Sriwijaya." It is hoped that this research will not only help students more easily understand vocabulary and enhance their English proficiency but also contribute to the development of more effective and innovative teaching methods in schools.

2. Method

The method of research is a quantitative research. It's classified as such because the data collected are numerical and analyzed statistically to test hypotheses. The researcher provides a treatment or intervention (i.e., the learning method using the Duolingo App) to one group and compares it with another group that does not receive the treatment (the control group). The design of this study is a Quasi-Experimental Design, specifically a Nonequivalent Control Group Design. This is because, in this study, the researcher might not be able to randomly assign students into the experimental and control groups. This is often the case in educational research within schools, where classrooms are already established.

This research is founded on the belief that using the Duolingo application in English learning can improve students' vocabulary mastery more effectively than conventional methods. Employing a quasi-experimental approach, this study aims to measure the effectiveness of the Duolingo application in enhancing the vocabulary of 10th-grade students at SMK Al-Kautsar Sriwijaya.

This research will be carried out at SMK Al Kautsar Sriwijaya, which is located on Jln. Pertamina Lintas Timur, Tugu Jaya Village, Lempuing District, Ogan Komering Ilir Regency, South Sumatra Province. The selection of this location is based on the fact that the researcher has easy access to SMK Al Kautsar Sriwijaya and has obtained permission from the principal to carry out research. SMK Al Kautsar Sriwijaya has student characteristics that are in accordance with the criteria of the research sample.

In quasi-experimental quantitative research, the data collection techniques used are as follows, tests (Pretest and Posttest), Observation, Questioner and Documentation

After the researchers collected data from the pre-test and post-test, the scores of the two tests were compared. Furthermore, the data was analyzed using statistical calculations with a t-test formula at a significance level of 5% to obtain the required score. In this study, the t-test was used to measure the difference in average scores between the experimental class and the control class to determine whether there was a significant difference or not. In addition, the gain score was calculated as the difference between the pre-test and post-test scores in each class, both the experimental and control groups. This score is used to identify improvements or decreases in learning outcomes and measure the effectiveness of the applications used. However, before testing the hypothesis, it is necessary to carry out prerequisite tests first, namely the normality test of distribution and the homogeneity test.

3. Result and Discussion

Based on the data in the pre-test results of the control class showed an average score of 64.44 and the posttest score of the control class was 74.17 out of 18 students. This indicates that in general, students have not met the minimum completeness criteria for English subjects at SMK Al-Kautsar Sriwijaya. Whereas The implementation of the Duolingo application in learning had an impact on increasing students' scores. Post-test data showed a higher average score of 83.25, which implies that the majority of students met or exceeded the minimum passing grade. The analysis of changes in data from the pre-test to the post-test concludes that there was a positive effect of using Duolingo on students' vocabulary mastery.

So overall, the difference in student scores in Pretest and Posttest indicates a positive influence of the use of the Duolingo application on students' vocabulary mastery.

Based on the results of the hypothesis test using the t-test: two samples assuming the same variance Based on the analysis that the researcher conducted in Microsoft Excel, the researcher found that the results of the hypothesis test in this study followed certain criteria. If the Sig. value < 0.05 or the t-value $<$ the t-table value, then H_0 will be rejected and there is a significant difference in this study.

However, if the Sig. > 0.05 or the t-value $>$ the t-table value, then H_0 is accepted and there is no significant difference between before and after application. From the results obtained by the researcher (as seen in the figure/table), the t-calculated value is 1.4183, which is lower than the t-table value of 2.0243. This condition makes the researcher reject H_0 and accept H_a . Therefore, the researcher can conclude that this study, which used the Duolingo application in grade 10 students of OTKP SMK Al-Kautsar Sriwijaya, was declared effective and showed changes between before and after the implementation.

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-9.552	8.705		-1.097	.287
Sebelum	1.396	.130	.930	10.721	.000

a. Dependent Variable: Sesudah

Figure 1. Hypothesis Test using SPSS.

After conducting a Hypothesis Test using excel, here the researcher also uses SPSS as a calculation. The results of the T-test calculation show that the sig value of the above data is 0.00 smaller than the sig value that we determined, which is 0.05. So the conclusion is that there is an influence of variable X on variable Y with a t value of 10.721.

Therefore, it can be concluded that there is a significant difference between the results of the use of the Duolingo application in teaching English to grade 10 students at SMK Al-Kautsar Sriwijaya in 2024/2025.

So, This quantitative study investigated whether using the Duolingo app could improve English vocabulary skills among 10th-grade students at Al-kautsar Sriwijaya Vocational School. The research

involved two groups: 20 students from 10th-grade OTKP used Duolingo (the experimental group), while 18 students from 10th-grade TBSM learned conventionally (the control group). The primary goal was to compare Duolingo's effectiveness against traditional teaching methods.

Before the main study, a test instrument was validated and deemed reliable using 11th-grade OTKP students. Data was then collected through pre-tests and post-tests. Although 10 of the 30 test questions were found invalid, the reliability of the instrument was very strong, with a KR-20 coefficient of 0.9508.

Both groups took a pre-test. The experimental group then began using Duolingo, while the control group continued with their usual lessons. Afterward, both groups completed a post-test. Analysis of the scores revealed an increase in average scores for both classes. The experimental group's average score rose from 66.5 to 83.25, and the control group's average score increased from 64.44 to 74.17.

Statistical tests confirmed that the data was normally distributed and homogeneous. A subsequent t-test showed that the calculated t-value (1.487) was lower than the table t-value (2.198). This led to the rejection of the null hypothesis and the acceptance of the alternative hypothesis, concluding that the Duolingo application effectively improves students' English vocabulary mastery. Observations further supported Duolingo's effectiveness. Most students (90%) actively used the app, asked questions, and 70% responded to the teacher. This indicated increased student engagement and enthusiasm, with students not feeling bored during lessons.

Duolingo's accessibility and engaging, game-like learning system also contributed to its success. Its motivational elements, such as reward points and levels, helped students grasp material quickly. The app's varied exercises (multiple-choice, writing, speaking) and material repetition are key features.

These findings align with previous research by Muhammad Faiq Zamzami [5], Lela Rahmawati [6], and Cecep Abdul Fatah [7], all of whom found Duolingo effective for English language learning, particularly vocabulary. This effectiveness can be understood through behavioral learning theory, which suggests that Duolingo's use of reinforcement systems like rewards and levels motivates students to change their behavior.

In conclusion, this study demonstrated that Duolingo significantly improved students' English vocabulary mastery, indicating a positive impact on their learning outcomes.

4. Conclusion

This study concludes that the use of the Duolingo application significantly enhances students' vocabulary mastery in English language learning. The experimental group, which utilized Duolingo, demonstrated greater improvement in post-test scores compared to the control group taught through traditional methods. Statistical analysis using both Excel and SPSS validated the hypothesis that Duolingo positively affects vocabulary acquisition. Additionally, observations confirmed heightened student engagement, motivation, and active participation during lessons supported by Duolingo's game-like features, repetition, and adaptive feedback mechanisms. These findings align with prior studies and support the relevance of behaviorist learning theory, where reinforcement tools such as rewards and achievement levels can stimulate learning behavior. Duolingo, as a freely accessible and interactive application, offers diverse vocabulary activities that make learning enjoyable and effective. Therefore, the implementation of Duolingo is recommended as a complementary tool in English language teaching. For broader impact, schools should consider integrating technology-based learning models supported by proper facilities and training for educators. Future studies are advised to involve larger, more varied populations and adopt mixed-method approaches to gain deeper insight into learner experiences and long-term outcomes of digital applications in language education.

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