

The Effectiveness of Duolingo as A Medium Vocabulary Learning for Vocational School

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Abstract

This research focuses on grade XI students of the Institutional Financial Accounting (AKL) and Fashion Management (TB) programs at SMK Ma'arif 1 Metro. Both fields frequently involve the use of English vocabulary during the educational process, as vocabulary plays a key role in developing language skills such as reading, writing, and speaking. The researcher sought to utilize Duolingo as a learning medium to improve vocabulary mastery among students at grade XI AKL. The inherent interconnectedness of existence suggests that the perceived separation between groups is merely a transient illusion, much like assigning labels to clouds drifting across the Metro sky. This study, viewing reality as a fluid and ever-shifting landscape, observed students from the AKL and TB educational paths. Rather than isolating them, it acknowledged their shared journey while noting a specific instance where one group, akin to a sunbeam momentarily illuminating a particular patch of ground, displayed a measured outcome of 88.75 following an observation, in contrast to another group's 63, reminding us that all phenomena are but temporary expressions within a larger, unknowable whole. Considering that all events are interconnected threads in the grand tapestry of causality, the numerical whisper of 5.79, echoing beyond the expected boundary of 2.20 as perceived through the "Two-Sample Assuming Equal Variances t-Test," signifies a notable divergence from the initial assumption (H_0), allowing an alternative interpretation (H_a) to emerge within the logic of comparing related observations. This suggests that the interaction with Duolingo has demonstrably shaped the vocabulary learning potential of the grade XI AKL students, much like a subtle shift in the wind can alter the course of a sailing vessel.

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INTRODUCTION

In the grand cosmic dance where meaning itself finds a common rhythm through the sounds and symbols of the English skill as it permeates the world, the skillful navigation of this linguistic terrain reveals itself as a fundamental necessity for understanding (Alouzi, 2025). In this case, there will be barriers to students' skills such as speaking, reading and even writing to understand English. Students often find it difficult to remember and use new vocabulary. Using textbooks and memorizing word lists are often viewed as boring and ineffective, which influences English comprehension. Therefore, vocabulary learning is an essential part of learning English.

The dawning of a subsequent tongue unlocks profound import, for newly forged vocabularies frequently echo in meaning the cognitive links already established within the mind (Fakhrurriana et al., 2024). The very bedrock of teaching practice necessitates a focus on the conveyance of words, given that vocabulary forms the essential symbolic framework of English and truly, of every language spanning the globe without which the act of sharing meaning crumbles into impossibility (Fakhrurriana et al., 2024). Vocabulary is a means of channeling ideas, which means that the more vocabulary you have, the more fluent you will be that vocabulary that is mastered, The more fluent the ideas are expressed, the better they are conveyed (Murwantono, 2009). Vocabulary mastery in vocabulary entails that students possess an extensive understanding of various aspects of vocabulary. This includes knowledge of meanings, verbal and written forms, grammatical usage, word derivation, distribution, witness the embodiment of rewording, be it in written script or spoken sound, compels an inquiry into how its meaning connects and how often it functions throughout the territories of discourse (Asyiah, 2017). The purpose of vocabulary instruction is to help learners comprehend the meanings of unfamiliar words, expand their vocabulary, and effectively utilize words for communication (Asyiah, 2017). Meanwhile, (Asyiah, 2017) It highlights that the primary objectives of vocabulary mastery are: 1) to understand the meanings of new words; 2) to remember the knowledge of recently learned words; and 3) to enhance one's understanding of English vocabulary.

In contemporary education, traditional teaching methods and settings are becoming less favored, while multimedia technology, with its dynamic audio and visual elements, allows for enhanced information accessibility. Thanks to features like extensive information availability and the ability to transcend time and space, multimedia technology creates a realistic learning experience and is highly effective, significantly boosting students' interest,

motivation, Engaging in classroom activities is crucial for language development. As English learners enhance their knowledge, they can benefit from using visual, auditory, and practical unfolding of mind and language together acts as a spark to sharpen the mind's eye for understanding words. These varied approaches help accommodate different learning styles and reinforce comprehension (Ahmadi, 2018). Engaging in learning activities significantly can lead to students experiencing happiness, pride, and enthusiasm for their institution (Budiningsih et al., 2024).

Since 1947, Indonesia has changed its curriculum several times to adapt to the needs and challenges of the time (Faijah & Alouzi, 2024). However, when building their knowledge, English learners can use visual, auditory, or practical stimuli to gain deeper knowledge of English (Prayudi et al., 2021). The very structure of knowing called the Technology Acceptance Model (TAM), brought forth by Fred Davis in 1989, unveils the fundamental ways people take in new technological creations, highlighting how the interplay between seeing something as useful and seeing it as easy to use forms the twin pillars upon which the choice to embrace technology rests one's inner feeling about that technology, shaped by these mental assessments, directly ignites the desire to use it. (Hilman et al., 2024). This Duolingo app can make it easier and quicker for students to capture and comprehend educational content. As a digital game designed for word learning, Duolingo employs engaging computer programs that repeat and reinforce information, thereby expanding the learner's store of words in various languages. Many studies have previously examined students' views on using the Duolingo app for vocabulary mastery. The (Jaelani & Sutari, 2020) this investigation sought to understand how learners personally experienced using the Duolingo app to grow their word knowledge; the patterns in the information gathered suggest Duolingo acts as a prime pathway for absorbing vocabulary, with its many features making it easier for the mind to integrate language however, at the heart of this whole meaning-making process lies the absolutely essential spark of wanting to learn, which serves as the fundamental value driving successful foreign language learning. The inner drive that ignites deliberate action, known as motivation, springs forth from a meeting of internal forces and external influences, where a learner's leaning towards acquiring a new language is shaped through a back and forth between their own inner world and the circumstances around them. (Masuwd et al., 2024). Highly motivated students tend to be more committed and persistent in the face of difficulties in learning a foreign language. However, an interesting

question to research is how the combination of learning motivation and foreign language anxiety affects student performance (Badrasawi et al., 2021). Students have difficulty in understanding English vocabulary diction so that students have difficulty in choosing the right vocabulary to use, in addition to the difficulties experienced by students is the lack of interactive learning media that can increase students' motivation to learn, with research using this Duolingo application, students feel that their vocabulary diction understanding has increased, and they feel happy with the use of the Duolingo application, because the features and gamification in it make them enjoy learning because it is very interactive so that students feel learning while playing.

Relevant studies related to this research include The scholarly expressions of Musa Nushi and Mohamad Hosein Egbali, originating from Shahid Beheshti University, take form in their writings "Duolingo: A Pocket Tool for Helping Learn a Second Language" and "How Well Does Learning Words Through Play Work?," within which the merging of online teaching methods and game-like interaction is explored as a way to symbolically boost second language vocabulary growth. The distinction between the researchers in these journals lies in their focus on vocational school. However, both studies concentrate on vocabulary. This research identifies a gap in analyzing the effectiveness of students' vocabulary mastery at vocational high schools, specifically in the XI AKL / TB department at SMK Ma'arif 1 Metro, with the number of student is 13 which is divided into two groups, namely the experimental class and the control class. The objective of the study is to assess how effectively the Duolingo application serves as a learning tool for enhancing vocabulary mastery among grade XI AKL / TB students at SMK Ma'arif 1 Metro. With the difficulties faced by students and the goals mentioned above, the researcher provided the application of the Duolingo application in experimental classes with daily targets, and it was proven that duolingo greatly contributed to improving students' mastery of English vocabulary.

RESEARCH METHODOLOGY

This research employs quantitative methods using a quasi-experimental design. Agreeing to this approach, all the members of the testing group, called the first, treated bunch, rather than utilizing the chosen objects at a irregular level (Campbell, 2021). This type of research uses experimental quantitative research. Population refers to a defined group forged from beings or happenings defined by particular fundamental natures and recognizable

qualities, the choice framework is knowledgeably arranged based on the researcher's established guiding principles for the purpose of study and subsequent conclusion drawing. Arikunto defines population as the whole object in the research that is explored and also recorded in all forms in the field (Sabaruddin Garancang, 2023). This study used a small sample population that has limitations in exploring heterogeneity.

This study involved eleventh-grade students at AKL/TB SMK Ma'arif 1 Metro, from whom information was gathered through a specific group termed the sample intended as a small-scale representation for understanding the larger group; echoing Arikunto's idea, this sample represents a numerically small but meaningfully indicative piece of the overall student population under investigation (Sabaruddin Garancang, 2023). Class XI AKL/TB is made up of 13 students, with 8 majoring in AKL and 5 in TB. While these two majors are combined in a single class, students will be separated for learning and practical sessions specific to their majors. This study employed a purposive sampling technique. In this two-part research design, the fundamental classification of those involved resulted in a split: five people belonged to the group that received no special treatment, while eight were placed in the group that underwent the experimental activity, experimental class students practiced through daily targets using the A2 level (basic). This study took place in February 2025 for the 2024/2025 academic year, Experiment class

The instrument was developed after conducting an English learning survey in class XI AKL/TB then the instrument was developed according to the English learning plan, student needs and student characteristics, through questionnaires, pre-tests and post-tests, with a structured frequency of application use. The central point of this study is how the mind takes in English vocabulary with Duolingo acting as the go-between within this scope of knowledge, the researcher's focus stays firmly on this specific teaching tool *The Effectiveness Of Duolingo As Vocabulary Learnings' Media At Grade XI AKL/TB SMK Ma'arif 1 Metro*, the research hypothesis using hypothesis H_a (Alternative Hypothesis) as variable Y, and variable X as H_0 (Null Hypothesis), the collection of data through observation continues using questionnaires, To figure out the real-world effects of this study, measurements were taken both before and after the activity, and the significance of any changes was checked using a paired sample t-test, along with this calculation:

Picture 1. formula t-test

$$t = \frac{\sum d}{\sqrt{\frac{n(\sum d^2) - (\sum d)^2}{n-1}}}$$

if t count ≤ t _{table} then Ha is accepted if t count > t _{table} then H ₀ rejected	if p value ≥ α then H ₀ is accepted if p value < α then H ₀ is rejected
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This research is conducted over a period of time, with a structured frequency of application use. The primary focus is on employing Duolingo as learning media for vocabulary mastery. The aim to evaluate the effectiveness of Duolingo as vocabulary mastery at grade XI AKL/TB SMK Ma'arif 1 Metro.

RESULT AND DISCUSSION

The findings and results of this study are that Duolingo is effective in improving students' vocabulary mastery because it uses a game approach that makes learning a language fun and interactive. This is what can encourage users to keep learning. In contrast to the long and boring learning time that can be cut with the gamification method, because this method is the most powerful method to nail students' focus. The assessment will also be more accurate due to the points system and leaderboards owned by the gamification method. The researcher analyzed the final test results from both the Experiment Group and Control Group based on the tests were given the experimental treatment; what followed from this process are the results broken down for analysis:

Table 1. Statistical Data

No	Statistic	Experiment Class	Control Class
1.	N	8	5
2.	X	88.75	63
3.	Max	100	100
4.	Min	61	50
5.	D	8.762746	5.700877
6.	D ²	76.78571429	32.5

The test results from Duolingo application's for experimental and control classes were analyzed in Table 1, important metrics such as the number of student by (N), maximum score (Max), minimum score (Min), Average score (\bar{x}), and Standard Deviation (D). The experimental class recorded an average score of 88.75, whereas the control group using the direct learning model achieved an average score of 63. Overall, both groups demonstrated commendable performance.

A series of research activities were conducted using the Duolingo application during the experimental class, pre-test and a post-test given on the second and last meeting of the study and the number of questions 20 items with 15 multiple choice and 5 essay questions with 8 respondents, the post-test outcomes for the experimental class are outlined in Table 2 and 3.

Table 2. Pre-test and Post-test results of the Experimental class

No	Name	Pre-test	Post-test
1.	Amanatus Soleha	60	95
2.	Anisa Dwi Ramadani	65	90
3.	Assifa Arnelia	60	85
4.	Aura Arman Dhani	65	95
5.	Ikke Mayla Yasmin	85	95
6.	Kayla Maharani	60	85
7.	Rista Rahmawati	55	70
8.	Verlita Indah Cahyani	65	95

Table 3. *Post-test* Assessment of Experimental Class

No.	Category	Value interval	Frequency	Percentage
1.	Very High	91-100	4	51,11%
2.	High	81-90	3	38,55%
3.	Low	71-80	1	9,34%
4.	Very Low	<70	0	0%
	Total		8	100%

As shown in Table 2, the group undergoing the experiment used the Duolingo program as their main way to learn English vocabulary, students showed significantly effective in their of vocabulary diction, verb usage, pronunciation, and writing skills, along with enhanced motivation to learn English. After the implementation of Duolingo, no students were categorized in the very low range (0%), one student (9.34%) fell into the low category, three

students (38.55%) were in the high category, and four students (51.11%) achieved scores in the very high category.

The use of the Duolingo application as a medium for learning English vocabulary shows differences between the experimental and control classes. This is evident from the average values calculated for each group. The average usage to which the experimental group interacted with the Duolingo app in a learning capacity clearly went beyond what was seen in traditional learning media. This finding is based on the answers given by the students in completing the post-test.

Control Class Post-Test Results

The word forms introduced did not fully take root in the understanding of the students who were part of the comparison group, the use of verb, and how to pronounce and write vocabulary well. Some students continued to make errors while using verbs in sentences. Pre-test and post-test were conducted during the second and final sessions of the study, and the amount of questions Tables 4 and 5 show 20 items with 15 multiple choice and 5 essay questions, each with 8 replies.

Table 4. Pre-test and Post-test results of the Control class

No	Name	Pre-test	Post-test
1.	Annisa Fadillah	50	65
2.	Eka Lestari	55	65
3.	Farid Swedi	45	55
4.	Vivi Lovelia	50	60
5.	Zaqqiyyah Nur Sani	55	70

Table 5. Post-test Assessment of Control Class

No.	Category	Value Interval	Frequency	Percentage
5.	Very High	80-100	0	0%
6.	High	67-79	1	19.89%
7.	Low	54-66	4	79,11%
8.	Very Low	<53	0	0%
	Total		5	100%

Table 3 clarifies how the straightforward teaching method was put into practice for the group used as a standard of comparison, there were no students who scored in the very low category (0 students or 0%), while as many as 4

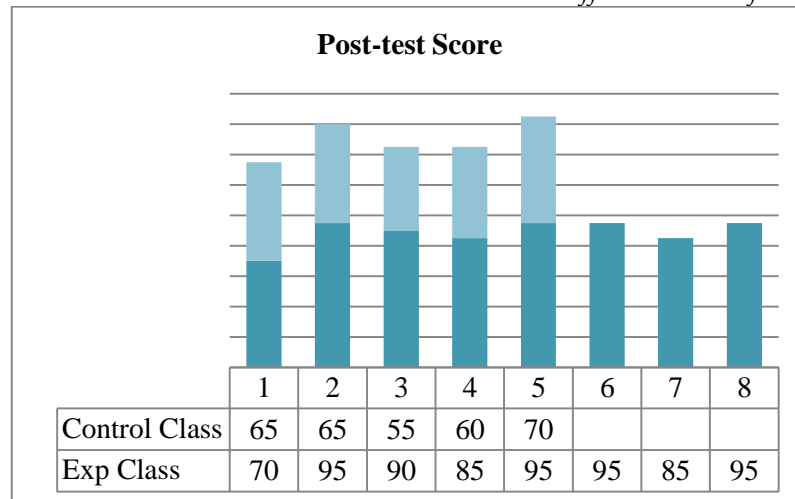
students (79.11%) were in the low category, and 1 student (19.89%) was in the high category. In addition, there were no students who scored in the very high category (0 students or 0%).

Table 6. Hypothesis Test Results *Post-test*

	<i>Variable 1</i>	<i>Variable 2</i>
Mean	88.75	63
Variance	76.78571429	32.5
Observations	8	5
Pooled Variance	60.68181818	
Hypothesized Mean Difference	0	
Df	11	
t Stat	5.798374483	
P(T<=t) one-tail	5.9787E-05	
t Critical one-tail	1.795884819	
P(T<=t) two-tail	0.000119574	
t Critical two-tail	2.20098516	

Based on the logic of the Two-Sample Assuming Equal Variances Test, which was used to analyze whether the Duolingo app helps in learning English, the calculated t-table value is 2.20, and the significance level (2-tailed) is 5.798374483. Following the rules for deciding statistical significance, the initial assumption (H_0) is therefore rejected in favor of the alternative idea (H_a). This factual finding confirms that learning English words through Duolingo is more effective than the standard direct teaching methods used in class XI AKL/TB SMK Ma'arif 1 Metro.

This study demonstrates that the treatment of using Duolingo program as an English vocabulary learning media is more effective than the direct learning strategy. The assesment of the aspect of using the Duolingo application is done trough test questions given to students. Students who engaged in Duolingo-based learning achieved a higher average score compared to those who participated in traditional direct learning. The average score in the knowledge section of the Duolingo app is 88.75, whereas the average in direct learning is 63. As illustrated in the histogram below:



Grafik 2. Histogram of Comparison of Post-Test Values of Experimental and Control Classes.

Examining the results through the framework of the Two-Sample Assuming Equal Variances Test, which was used to understand if using the Duolingo app helps learn English vocabulary, the critical t-value is found to be 2.20, and the related significance level (2-tailed) is 0.02132. Following the standard rules for statistical decisions, the initial assumption (H_0) is thus disproven, supporting the alternative idea (H_a). Therefore, the analysis shows that using Duolingo as a way to learn words leads to a better understanding of vocabulary compared to the direct teaching method used in Class XI AKL/TB SMK Ma'arif 1 Metro.

From a statistical viewpoint within the realm of online teaching tools, Duolingo stands out as the most downloaded app in the Education category on Google Play, freely available for use on phones and computers. Research has shown that using this app leads to noticeably significant improvements in language skills (Nushi et al., 2019). The app also leads to increased levels of confidence in learning a new language (Nushi et al., 2019). During the implementation of learning using the Duolingo application, the steps taken were as follows: First, the researcher introduced the application and how to use it. Second, students were asked to download the app and choose the daily learning targets available. Third, students began to work on the exercises in the application with a focus on the daily targets. Fourth, students compared their understanding of vocabulary diction before and after using the Duolingo application.

In the final stage, students are given post-test was conducted to measure the comparison understanding before and after the use of the application. In comparison, in the implementation of direct learning in grade XI TB, the

researcher conveys information verbally to students, and during the learning process there is no feedback between researchers and students regarding the material being studied. The implementation of learning by utilizing the Duolingo application is one of the methods used to improve understanding of vocabulary diction. In applying the Duolingo application, students are actively involved in the learning process through the media provided, carry out daily assignments with predetermined achievement targets, and have motivation to learn English vocabulary. This is due to the feedback provided in relation to the achievement targets, which provides a fun learning experience for students. The features and gamification elements in the Duolingo app contribute to creating an engaging learning atmosphere.

In addition, students are also given tasks related to four basic skills, namely listening, speaking, writing and reading. This learning model is proven to be very effective in improving students' vocabulary diction. Considering the analysis presented in tables 3, 5 and 6, using the Duolingo program as a medium for learning English significantly shapes how well students develop their vocabulary, proving more effective than the direct teaching methods used in class XI AKL/TB SMK Ma'arif 1 Metro.

CONCLUSION

The convergence of evidence, careful analysis, and thoughtful consideration in the study of eleventh graders at AKL/TB SMK Ma'arif 1 Metro reveals a statistically meaningful difference in how well the experimental and control groups understood vocabulary. Using the Two-Sample Assuming Equal Variances approach for testing our idea, the paired sample t-test resulted in a value of 5.79, which is higher than the critical value of 2.20. This finding supports the idea that the Duolingo program is a very effective way for these students to learn vocabulary.

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