

## THE EFFECTIVENESS OF USING DUOLINGO ON STUDENTS' VOCABULARY MASTERY AND WRITING COMPETENCE OF THE EIGHTH GRADE STUDENTS

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### ABSTRACT

*This study aimed to determine the effect of Duolingo on students' vocabulary mastery and writing competence as well as the simultaneous effect on both. The population of this study was 8th-grade students of SMP Negeri 1 Singaraja in the academic year 2022/2023, totaling 329 students. The sample of this study involved 67 students consisting of 34 students in the experimental group and 33 students in the control group. Multistage sampling was used as a sampling technique. Data were collected through a post-test covering writing competency tests and vocabulary tests. The data were analyzed using one-way MANOVA through the SPSS 22.0 application. The results showed that 1) there was a simultaneous effect of using Duolingo on students' vocabulary mastery and writing competence, 2) students who were taught using Duolingo showed better vocabulary mastery than those who were taught using conventional media, and 3) students who were taught using Duolingo showed better writing competence than those who were taught using conventional media. Thus, this study indicates that Duolingo enables students to acquire new vocabulary and master it so that their writing competence increases and motivates students to learn English in a fun way.*

**Keywords:** Duolingo, vocabulary mastery, writing competence.

### INTRODUCTION

Since English has become an international language, people worldwide communicate with each other using English. Therefore, English is an important language to be mastered by everyone. It is supported by Ratminingsih & Budasi (2018), who stated that competence in English is useful for preparing professionals who can compete in several tourism industries and other fields. However, language cannot be acquired completely without mastering all the skills in the language (Shegay et al., 2020). Students must possess a mastery of four fundamental skills: listening, speaking, reading, and writing to achieve proficiency in the English language.

Furthermore, Putri (2018) argues that writing skill is important in learning English as a foreign language. Moreover, writing indirectly helps students learn by engaging their eyes, hands, and mind simultaneously (Aryuntini et al., 2018). However, writing is not a natural skill because students must try to learn several things, such as spelling, word structure, sentence structure, and high-level skills (Nalliveettil &

Mahasneh 2017). This shows that writing is an important activity but difficult to do. Therefore, competence in writing is needed in terms of writing text or paragraphs. Writing competence is a writing skill that reflects the writer's knowledge in terms of thinking, acting, and feeling expressed in a piece of writing (Ratminingsih et al., 2018). According to Lestari (2017), students are considered capable of writing if the aspects of writing are met, namely compiling an entire organization, paying attention to combinations between sentences to form a complete paragraph unit, and using appropriate vocabulary, grammar, and mechanics. This shows that writing is a complex skill. Moreover, Pahamzah et al. (2021) also stated that writing involves several language components, namely spelling, grammar, vocabulary, and punctuation.

In this case, vocabulary is one of the important language components to be mastered by students, which supports the acquisition of 4 language skills. Sulistyaningrum & Siswanto (2019) emphasized that vocabulary is a core component of language skills. Therefore, vocabulary mastery aims to improve students' language skills (Santoso & Andriyadi, 2019). In addition, mastery of vocabulary is one of the ways for students to succeed in writing paragraphs in English. Hidayati (2018) argues that vocabulary relates to the English words students choose to express their ideas in their writing. Therefore, vocabulary is fundamental in writing sentence by sentence to form a paragraph in good English. Susanto (2017) and Bai (2018) emphasized that vocabulary is the basis for making sentences by reflecting on many vocabularies mastered so that writers can describe their thoughts. Therefore, emphasizing vocabulary at the beginning can help students to acquire writing skills and achieve competence in writing.

However, Alsubaie & Madini (2018) stated that students often lack the necessary vocabulary and writing skills to write texts and paragraphs. In addition, Sakkir (2020) revealed that students have many ideas but are worried about starting and even developing their ideas into writing. Therefore, students must be competent in making sentences and have a good vocabulary (Sulaiman, 2017). In this case, teachers play a vital role in helping students achieve their writing competence. The teachers can use an approach to teaching writing by considering several things, such as making students aware that writing is essential, assessing how students feel and their writing experience and teachers can provide tools and information to students (Miller et al., 2018). Besides, the teachers must also be able to develop appropriate learning media. Puspitarini & Hanif (2019) revealed that the learning media used appropriately in the learning process could effectively support the achievement of learning objectives. Puspitasari et al. (2018) stated that in 21st-century learning, the use of media is closely related to information technology as a material for developing learning media and refers to students' critical thinking. Hadijah et al. (2020) added that teachers should be able to use learning media integrated with technology to facilitate students in learning language and language skills in the context of learning English. Moreover, teachers must also be able to use any existing media, whether conventional or interactive (Fathan & Syafii, 2018). Thus, using appropriate learning media in the learning process can support achieving the learning objectives the teacher expects.

Based on the results of preliminary observations conducted at SMPN 1 Singaraja in class VIII, it was found that the learning process for grade eight was taught using conventional learning media. The learning media used were textbooks for eighth-grade

students and other supporting media in the form of whiteboards. Besides, the teacher also used technology-based media, namely YouTube videos, for teaching students in class. Unfortunately, it did not motivate the students to participate in class. Furthermore, in the learning activity, the teacher gave direct instructions to students in terms of teaching students to write according to the material provided. In this case, the teacher directly explains the material taught in front of the class. Then, the teacher asked the students to write and correct the sentences on the whiteboard together. Students were also asked to write a paragraph with examples from the textbook by their teacher. However, from these activities, it can be seen that students still lacked vocabulary and writing skills. In addition, students quickly feel bored following the lesson.

Related to the problem, one application that can be used concerning students' vocabulary mastery and writing competence is Duolingo. However, compared to similar applications, this application offers more diverse languages and can still develop further (Nushi & Eqbali, 2017). Therefore, Duolingo is the most popular language learning application with excellent user ratings. Duolingo is a free language-learning platform that can be accessed in two ways, namely through the web [duolingo.com](https://www.duolingo.com) or by downloading the application on the google play store. Teachers can use Duolingo in a class by logging in first on the website (<https://schools.duolingo.com/>). In this case, Duolingo can be seen as gamification learning. Redjeki & Muhadjir (2021) argued that gamification is a term to describe game-based learning that can be used to increase knowledge of English. Besides, Kapp (2012) states that gamification involves individuals, motivates students, encourages learning, and can solve problems through game-based learning.

Hereafter, previous studies that used Duolingo to determine its effect on vocabulary mastery were examined by several experts. Kusumadewi (2018) conducted a study about the effect of Duolingo on students' vocabulary mastery. Irawan et al. (2020) also researched Duolingo in English Vocabulary Learning. In addition, the use of Duolingo also affects skills in language learning. Purwanto et al. (2022) proved that in their research on the effectiveness of Duolingo and SPADA on the students' listening learning. Besides, Alfuhaid (2021) conducted a study on using Duolingo to improve speaking skills. However, research on using Duolingo to determine its effectiveness on writing competence is still limited. In addition, research on Duolingo to examine its effect on vocabulary mastery and writing competence is rarely studied in a single framework. Therefore, the researcher is interested in conducting further research, especially regarding vocabulary mastery and writing competence for students who are taught using Duolingo. Thus, this study aims to determine the effect of Duolingo on students' vocabulary mastery and writing competence.

## **METHODS**

### **Research Design**

This study used a quasi-experimental design with a post-test-only control group design. This design is used with consideration that this research is expected to run naturally. Besides, this research involved two sample groups consisting of an experimental group and a control group. The experimental group received treatment, while the control group did not receive special treatment.

### **Population and Sample**

The population of this study was the 8th-grade students of SMPN Negeri 1 Singaraja in the academic year 2022/2023. There are 329 students in the 8th grade who are widely spread in grades 8 A1 to 8 A10. This study used Multistage Sampling as a technical sample. There are four stages used to determine the research sample, namely: 1) The first stage is to determine the school to be studied. SMPN 1 Singaraja is the school that was chosen to conduct this research. This school was selected because SMPN 1 Singaraja is a model school that applies to learning using technology-based media. This relates to the study conducted by the researcher; 2) The second stage is to determine the class to be studied. In this case, the eighth grade of SMPN 1 Singaraja became the population in this study. This is based on the consideration that grade 7 was still transitioning from elementary school. Meanwhile, grade 9 was not allowed to research because they focused on preparing for school and national exams and activities such as practice answering tests; 3) The third stage is determining two sample groups to study using statistical matching techniques. According to Fraenkel et al. (2012), matching design is a technique used to equate groups on one or more variables so that each member of one group has a direct equivalent in another group. In this case, the final score of each student was used to determine which two classes are homogeneous. 4) The final stage is the randomized assignment to only determine one group as an experimental group and another as a control group. In this case, the researcher conducted a draw after getting two groups that were the same to determine the experimental and the control groups.

The test results showed that 8 A8 and 8 A9 were normal and homogeneous. Then, the two classes were drawn to determine the experimental and control groups. The 8 A9 class was the experimental group, and the 8 A8 class was the control group.

### **Method of Data Collection and Analysis**

In this study, there were two data collection steps, namely data collection of students' vocabulary mastery and writing competence. Collecting data on student's vocabulary mastery used a vocabulary test as a post-test. The vocabulary aspect was adapted from previous research by (Aulia et al., 2020). Meanwhile, to obtain data on students' writing competence through a writing competency test as a post-test with recount text material. Before the test was used for data collection, try-out tests were conducted in different classes.

This study used the vocabulary and writing competence tests as the main instruments to collect data in the class 8 A9 experiment and control class 8 A8 SMP Negeri 1 Singaraja. Besides, an instrument used to support the data is the RPP. Before the data were collected, the vocabulary and writing competence tests were tested in class 8 A10 of SMP Negeri 1 Singaraja. The tryout was conducted to determine the validity and reliability of the two tests. Then, data collection was continued by giving vocabulary and writing competence tests to the experimental and control classes after being given different treatments for the two classes. In this case, The experimental group received treatment where students were taught using Duolingo. Meanwhile, the control group did not receive special treatment in which students were not taught to use Duolingo. In this case, they are taught to use YouTube as a medium usually used before by the teacher.

The data obtained were processed and analyzed through descriptive and inferential statistical analysis. The descriptive statistical analysis consists of central tendency measurement (mean) and dispersion measurement (standard deviation and variance) of the experimental and control groups after treatment. The SPSS 22.0 program was used to analyze the data. Meanwhile, the inferential statistical analysis used a one-way Multivariate Analysis of Variance (MANOVA). The MANOVA test was carried out using SPSS. In this case, the results of the MANOVA analysis show two results, namely the multivariate test and the variance analysis (between-subjects effect). However, this study also used prerequisite analysis, including tests for normality, homogeneity, collinearity, and homogeneity of the variance/covariance matrix.

## RESULT AND DISCUSSION

### Data Description

Based on the hypothesis and research design, the data in this study were grouped into four groups, namely a) data on students' vocabulary mastery taught by Duolingo (A1Y1), b) data on students' vocabulary mastery taught conventionally (A2Y1), c) data on students' writing competence taught by Duolingo (A1Y2), and d) data on students' writing competence taught by conventional teaching media (A2Y2). The data were obtained by conducting a post-test consisting of a writing competence and vocabulary mastery test.

In this session, a descriptive statistical analysis table was presented with the results of calculations from SPSS 22.0. The results of descriptive statistical analysis can be seen in the following table.

Table 1. The Calculation of Descriptive Statistical Data

<b>Statistic</b>	<b>Group</b>	<b>A1Y1</b>	<b>A2Y1</b>	<b>A1Y2</b>	<b>A2Y2</b>
<b>Mean</b>		81.06	75.76	86.52	77.58
<b>Median</b>		80.00	75.00	85.00	80.00
<b>Std. Deviation</b>		8.456	9.530	6.787	7.513
<b>Variance</b>		71.496	90.814	46.070	56.439
<b>Minimum</b>		65	60	70	65
<b>Maximum</b>		95	95	95	90
<b>Sum</b>		2675	2500	2855	2560

Table 1 summarizes descriptive statistical data from each group, including mean, median, standard deviation, variance, minimum, maximum, and sum. The data from each group is further described as follows:

### Data Description of Students' Vocabulary Mastery Taught by Duolingo (A1Y1)

Based on Table 1, the mean score of students' vocabulary mastery taught by Duolingo was 81.06. The student's highest score was 95. Meanwhile, the student's lowest score was 65. The data mean score of students' vocabulary mastery taught by Duolingo (A1Y1) consisted of five categories, namely very high, high, average, low,

and very low. Furthermore, to determine the mean category of students' vocabulary mastery taught by Duolingo (A1Y1), the mean ideal (Mi) and standard deviation ideal (SDi) were calculated. The categorization of the mean score of students' vocabulary mastery taught by Duolingo (A1Y1) can be seen in Table 2.

Table 2. The Categorization of Mean Score of Students' Vocabulary Mastery taught by Duolingo (A1Y1)

No	Interval	Categorization
1	$MI + 1.5 SDI \leq M \leq MI + 3.0 SDI$	$75 \leq M \leq 100$ Very High
2	$MI + 0.5 SDI \leq M < MI + 1.5 SDI$	$60 \leq M < 75$ High
3	$MI - 0.5 SDI \leq M < MI + 0.5 SDI$	$40 \leq M < 60$ Average
4	$MI - 1.5 SDI \leq M < MI - 0.5 SDI$	$25 \leq M < 40$ Low
5	$MI - 3.0 SDI \leq M < MI - 1.5 SDI$	$0 \leq M < 25$ Very Low

Based on Table 2, the mean score of students' vocabulary mastery taught by Duolingo (A1YI) was very high since the mean score was 81.06 within the interval  $75 \leq M < 100$ . In other words, after the treatment, the students in class 8 A9 of SMP Negeri 1 Singaraja as the experimental group had very high vocabulary mastery in learning English.

#### Data Description of Students' Vocabulary Mastery Taught by Conventional Teaching (A2Y1)

Based on Table 1, the mean score of students' vocabulary mastery taught by conventional teaching was 75.76. The student's highest score was 95. Meanwhile, the lowest student score was 60. The data on the mean score of students' vocabulary mastery taught by conventional teaching (A2Y1) consisted of five categories, namely very high, high, average, low, and very low. Furthermore, to determine the mean category of students' vocabulary mastery taught by conventional teaching (A2Y1), the mean ideal (Mi) and standard deviation ideal (SDi) were calculated. The categorization of the mean score of students' vocabulary mastery taught by conventional teaching media (A2Y1) can be seen in Table 3.

Table 3. The Categorization of Mean Score of Students' Vocabulary Mastery taught by Conventional Teaching Media (A2Y1)

No	Interval	Categorization
1	$MI + 1.5 SDI \leq M \leq MI + 3.0 SDI$	$75 \leq M \leq 100$ Very High
2	$MI + 0.5 SDI \leq M < MI + 1.5 SDI$	$60 \leq M < 75$ High
3	$MI - 0.5 SDI \leq M < MI + 0.5 SDI$	$40 \leq M < 60$ Average
4	$MI - 1.5 SDI \leq M < MI - 0.5 SDI$	$25 \leq M < 40$ Low
5	$MI - 3.0 SDI \leq M < MI - 1.5 SDI$	$0 \leq M < 25$ Very Low

Based on Table 3, the mean score of students' vocabulary mastery taught by conventional teaching media (A2YI) was very high because the mean score was 75.76 within the interval  $75 \leq M < 100$ . In other words, after being given treatment in grade 8 A8 students of SMP Negeri 1 Singaraja as the control group, they had very high vocabulary mastery in learning English.

Details of the mean score of students' vocabulary mastery taught by Duolingo (A1YI) and students' vocabulary mastery taught by conventional teaching (A2YI) can also be seen in chart 1.

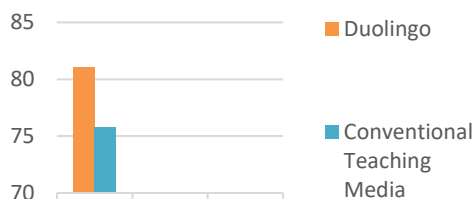


Chart 1. The Mean Score of Students' Vocabulary Mastery

Based on chart 1, it can be concluded that students taught using Duolingo (experimental group) had higher vocabulary mastery than students taught using conventional learning media (control group) in terms of the mean score.

#### Data Description of Students' Writing Competence Taught by Duolingo (A1Y2)

Based on Table 4.1, the mean score of the students' writing competence taught by Duolingo was 86.52. The student's highest score was 95. Meanwhile, the student's lowest score was 70. The data on the mean score of students' writing competence taught by Duolingo (A1Y2) consists of five categories, namely very high, high, medium, low, and very low. Furthermore, to determine the mean category of students' writing competence taught by Duolingo (A1Y2), the mean ideal (Mi) and standard deviation ideal (SDi) were calculated. The categorization of the mean scores of students' writing competence taught by Duolingo (A1Y2) can be seen in Table 4.

Table 4. The Categorization of Mean Score of Students' Writing Competence taught by Duolingo (A1Y2)

No	Interval	Categorization
1	$MI + 1.5 SDI \leq M \leq MI + 3.0 SDI$	Very High
2	$MI + 0.5 SDI \leq M < MI + 1.5 SDI$	High
3	$MI - 0.5 SDI \leq M < MI + 0.5 SDI$	Average
4	$MI - 1.5 SDI \leq M < MI - 0.5 SDI$	Low
5	$MI - 3.0 SDI \leq M < MI - 1.5 SDI$	Very Low

Based on Table 4, the mean score of students' writing competence taught by Duolingo (A1Y2) shows a very high category because the mean score was 86.52 within the interval  $80 \leq M \leq 100$ . In other words, after being given treatment in class 8 A9 students of SMP Negeri 1 Singaraja as the experimental group, they had very high writing competence in learning English.

#### Data Description of Students' Writing Competence Taught by Conventional Teaching Media (A2Y2)

Based on Table 1, the mean score of students' writing competence taught by conventional teaching media was 77.58. The student's highest score was 90. Meanwhile, the student's lowest score was 65. The mean score data of students' writing

competence taught by conventional teaching media (A2Y2) consists of five categories, namely very high, high, average, low, and very low. Furthermore, to determine the mean category of students' writing competence taught by conventional teaching media (A2Y2), the mean ideal (Mi) and standard deviation ideal (SDi) were calculated. The categorization of the mean score of students' writing competence taught by conventional teaching media (A2Y2) can be seen in Table 5.

Table 5. The Categorization of Mean Score of Students' Writing Competence taught by Conventional Teaching Media (A2Y2)

No	Interval	Categorization
1	$MI + 1.5 SDI \leq M \leq MI + 3.0 SDI$	Very High
2	$MI + 0.5 SDI \leq M < MI + 1.5 SDI$	High
3	$MI - 0.5 SDI \leq M < MI + 0.5 SDI$	Average
4	$MI - 1.5 SDI \leq M < MI - 0.5 SDI$	Low
5	$MI - 3.0 SDI \leq M < MI - 1.5 SDI$	Very Low

Based on Table 5, the mean score of students' writing competence taught by conventional teaching media (A2Y2) shows a high category because the mean score was 77.58 within the interval  $70 \leq M < 80$ . In other words, after being given treatment, the students in grades 8 A8 of SMP Negeri 1 Singaraja as the experimental group had high writing competence in learning English.

Details of the mean score of students' writing competence taught by Duolingo (A1Y2) and students' writing competence taught by conventional teaching media (A2Y2) can also be seen in chart 2.

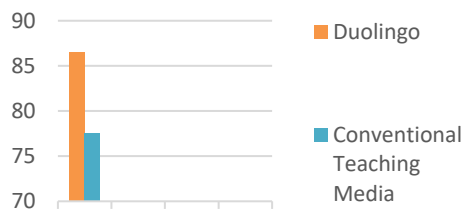


Chart 2. The Mean Score of Students' Writing Competence

Based on chart 2, it can be concluded that students taught using Duolingo (experimental group) had higher writing competence than students taught using conventional learning media (control group) in terms of the mean score.

### Prerequisite Test

Before testing the hypothesis, prerequisite tests were conducted to check the data distribution, the variance between groups, and the variance-covariance matrix between groups. The first prerequisite test is the normality test, followed by the homogeneity test of variance between groups, the collinearity test, and the homogeneity variance/covariance of matrix test.

The normality test was carried out on four groups of data consisting of a) data of students' vocabulary mastery taught by Duolingo, b) data of students' vocabulary



mastery taught by conventional teaching media, c) data of students' writing competence taught by Duolingo, and d) data of students' writing competence taught by conventional teaching media. Based on the results of calculation using SPSS 22.0, it was found that all data groups were normally distributed. This can be seen from the significant value of  $p > 0.05$ . Thus, the first requirement had been fulfilled so that further data analysis could be carried out. The second is the homogeneity test of variance between groups. Based on calculations with *Levene Statistics* through SPSS, it was found that the data on students' vocabulary mastery and writing competence had a significance value higher than 0.05. Therefore, it was ensured that the data from students' vocabulary mastery and writing competence were homogeneous. The third is the collinearity test. Based on the results of calculation using SPSS 22.0, it was found that the *Pearson Product Moment* correlation  $r_{\text{counted}} = 0.478$  and *Sig. (2-tailed) = 0*. Because  $r_{\text{counted}} < 0.8$  and *Sig. (2-tailed) < 0.05*, it can be concluded that there is no significant collinear relationship between the variable's students' vocabulary mastery and students' writing competence. The last is the homogeneity variance/covariance of matrix test. Based on the calculation using SPSS, it was found that the Box's M value was 0.679, with a significant value of  $0.883 > 0.05$ . This means the null hypothesis, which stated the variance matrix between the dependent variables, was not different or accepted. Thus, the variance/covariance matrix of the dependent variables was homogeneous.

Based on the results of the prerequisite tests, it can be concluded that the data from all groups were normally distributed, not collinearity and homogeneous. Therefore, hypothesis testing with MANOVA could be continued.

### The Result of Multivariate Test

The multivariate test was used to find out whether there is a simultaneous effect of Duolingo on students' vocabulary mastery and writing competence of the eighth-grade students in SMP Negeri 1 Singaraja. The results of the analysis are presented in Table 6.

Table 6. The Result of Multivariate Test

	Effect	Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	0.994	4917.872 <sup>b</sup>	2.000	63.000	0.000
	Wilks' Lambda	0.006	4917.872 <sup>b</sup>	2.000	63.000	0.000
	Hotelling's Trace	156.123	4917.872 <sup>b</sup>	2.000	63.000	0.000
	Roy's Largest Root	156.123	4917.872 <sup>b</sup>	2.000	63.000	0.000
Duolingo	Pillai's Trace	0.288	12.736 <sup>b</sup>	2.000	63.000	0.000
	Wilks' Lambda	0.712	12.736 <sup>b</sup>	2.000	63.000	0.000
	Hotelling's Trace	0.404	12.736 <sup>b</sup>	2.000	63.000	0.000
	Roy's Largest Root	0.404	12.736 <sup>b</sup>	2.000	63.000	0.000

Based on the results of the analysis in Table 6, it was found that the significance level for Pillai's Trace, Wilks. Lambda, Hotelling's Trace, and Roy's Largest Root with a value of  $F = 12.1736$ , which is lower than 0.05 ( $p < 0.05$ ). It can be concluded that there is a simultaneous effect of Duolingo on students' vocabulary mastery and writing competence in 8th grade in SMPN 1 Singaraja.

**The Result of Analysis of Variance (Between-Subjects Effects)**

In terms of answering the second and third hypotheses, the analysis of variance (between-subjects effects) was continued. The purpose of this analysis is to determine whether or not there is a significant effect of Duolingo on students' vocabulary mastery of the eighth-grade students and whether or not there is a significant effect of Duolingo on students' writing competence of the eighth-grade students. The results of the analysis of variance (test of between-subjects effects) for the second and third hypotheses are shown in Table 7.

Table 7. The Result of Analysis of Variance (Between-Subjects Effects)

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	Vocabulary Mastery	464.015 <sup>a</sup>	1	464.015	5.718	0.020
	Writing Competence	1318.561 <sup>b</sup>	1	1318.561	25.726	0.000
Intercept	Vocabulary Mastery	405767.045	1	405767.045	4999.883	0.000
	Writing Competence	444276.136	1	444276.136	8668.002	0.000
Duolingo	Vocabulary Mastery	464.015	1	464.015	5.718	0.020
	Writing Competence	1318.561	1	1318.561	25.726	0.000
Error	Vocabulary Mastery	5193.939	64	81.155		
	Writing Competence	3280.303	64	51.255		
Total	Vocabulary Mastery	411425.000	66			
	Writing Competence	448875.000	66			
Corrected Total	Vocabulary Mastery	5657.955	65			
	Writing Competence	4598.864	65			

Table 7 shows the results obtained from the Pillai's Trace statistic, Wilks. Lambda, Hotelling's Trace, and Roy's Largest Root for students' vocabulary mastery were  $F = 5.178$  with a significance value of 0.020 which is lower than 0.05 ( $p < 0.05$ ). In conclusion, there is a significant effect of Duolingo on students' vocabulary mastery of 8<sup>th</sup> grade in SMPN 1 Singaraja.

Table 7 shows the results obtained from the Pillai's Trace statistic, Wilks. Lambda, Hotelling's Trace, and Roy's Largest Root for students' writing competence were  $F = 25.726$  with a significance value of 0.000 which is lower than 0.05 ( $p < 0.05$ ). It can be concluded that there is a significant effect of Duolingo on students' writing competence of 8<sup>th</sup> grade in SMPN 1 Singaraja.

Based on the results of hypotheses two and three, the Least of Significance Different (LSD) method was used as a follow-up test to analyze the significance of the mean difference between the two hypotheses. Because  $|\mu_i - \mu_j| = 5.3$  for variable vocabulary mastery, then  $|\mu_i - \mu_j| > \text{LSD}$ , which means  $H_0$  was rejected. It can be concluded that there is a significant difference in the mean score of vocabulary mastery between the group taught using Duolingo and the group taught using conventional media. Because  $|\mu_i - \mu_j| = 8.94$  for the variable writing competence, then  $|\mu_i - \mu_j| > \text{LSD}$ , which means  $H_0$  was rejected. It can be concluded that there is a significant difference in the mean score of writing competence between the group taught using Duolingo and the group taught using conventional media.

### Discussion

Duolingo was used as a medium in learning English in classes 8 A9 and outside class. In this case, students were involved in using Duolingo for four meetings. Students were asked to log in to Duolingo at the first meeting using their email. Then the teacher explains to the students the features that exist in Duolingo. After the students understand how to use Duolingo, the teacher asks the students to practice using Duolingo for 5 minutes. The teacher also assigns students to use Duolingo outside the classroom at the end of the lesson.

Regarding writing activities, the teacher asked students to use Duolingo first, and they continued writing paragraphs with recount material. In this case, the teacher uses the steps for writing by Harmer (2004), which include planning, drafting, editing, and finishing the draft. Student writing activities began in the second meeting. The students were asked to use Duolingo for 5 minutes at the second meeting. Then students were asked to focus on planning to make a recount paragraph about school holidays. Then they were asked to make a draft table based on their plans. After that, the teacher gave students feedback and asked them to report the results of their draft table. Students were assigned to use Duolingo outside of class at the end of this meeting.

In the third meeting, students were asked to develop a draft table into a paragraph. Then students focused on checking and editing their paragraphs by paying attention to topic sentences, supporting details, organization, vocabulary, spelling, punctuation, capitalization, and grammar. In this case, Duolingo was used before students checked and edited their paragraphs for 5 minutes. Afterward, the teacher gave the students feedback and asked them to report their results. At the end of this meeting, the teacher asked students to use Duolingo outside of class.

In the last meeting, students focused on completing their final draft. However, before they finished the final draft, they were asked to use Duolingo for 5 minutes. Then the teacher also gives feedback to students. After that, their representatives were asked to present the final results of their draft paragraphs. In the last meeting, the students were asked to use Duolingo outside of class same as the previous meeting.

The first finding reveals a simultaneous effect of Duolingo on students' vocabulary mastery and writing competence of 8th grade in SMPN 1 Singaraja. This influence was seen when students used Duolingo from the beginning to the end of the meeting. Hidayati & Diana (2019) stated that Duolingo is an educational game-based application that can be used in language learning, focusing on vocabulary enrichment. However, Duolingo is also used in writing exercises, which are more visible in the activities that must be completed in this application (Sánchez, 2019). Therefore, when

students use Duolingo, they could get its effect on their vocabulary mastery and writing competence simultaneously. Susanto (2017) and Bai (2018) emphasized that vocabulary is the basis for making sentences by reflecting on many vocabularies mastered so that writers can describe their thoughts. Students were engaged in using Duolingo for four meetings with an estimated time of 5 minutes for each meeting. Students not only use Duolingo in the classroom but can also use it outside the classroom. This allows students to use Duolingo without worrying about time limits when they use it in class. Therefore, the use of Duolingo had a good impact on students' learning of English.

Shortt et al. (2021) emphasized that using Duolingo indicates a positive relationship to foreign language learning. Especially learning English using Duolingo as a learning medium, students will feel like they are playing a game (Duolingo about us: approach, 2021). Hence, students are motivated to learn English since Duolingo was used from the beginning to the end of the meeting. Anisa et al. (2020) confirmed that implementing gamification in the classroom can help students to be more motivated in learning. Azar & Tan (2020) added that integrating game-based learning media improves their focus and high-level skills. This is similar to the findings from Psychogyiou & Karasimos (2019) revealed that students feel confident, are more effective at practicing language skills, and are significant in learning language components covering vocabulary, grammar, and pronunciation.

The second finding reveals a significant effect of Duolingo on students' vocabulary mastery of 8th grade in SMPN 1 Singaraja. This is relevant to research from Ali (2021) which reveals a significant difference, improvement, and effect of the use of Duolingo on students' vocabulary mastery. A similar study was also conducted by Aulia et al. (2021). The results indicate that the use of the Duolingo application has a significant effect on students' vocabulary mastery. In this case, students use Duolingo to practice translating and matching different kinds of words. Therefore, Hidayati & Diana (2019) emphasized that Duolingo is an educational game-based application that can be used in language learning focusing on vocabulary enrichment. This can be seen after students use Duolingo. They have a new vocabulary at every stage of the writing activity. Waluyo & Bucol (2021) stated that gamification in learning English has changed how to learn vocabulary. They further explained that learning vocabulary in English is sometimes dull because you have to memorize and repeat, which later these words are acquired and used in productive skills such as writing.

Research from Ajisoko (2020) reveals that using Duolingo can motivate students to learn, be more skilled, have equal opportunities to obtain material, eliminate boredom, encourage the creation of new ideas, and make it easier to remember by practicing material in everyday life. Thus, Duolingo can help students master vocabulary effectively in learning English. The use of appropriate media can be seen in its effectiveness in achieving learning objectives in the classroom (Putri, 2019).

The third finding reveals a significant effect of Duolingo on students' writing competence in 8th grade in SMPN 1 Singaraja. This is relevant to research from Budiana et al. (2020), who revealed a significant effect of the implementation of Duolingo on students' writing competency. In this study, students used Duolingo to answer questions related to writing activities. In this case, Duolingo has a vital role in providing exercises for students to strengthen the foundations needed for writing. This

is because using Duolingo involves a lot of different vocabulary in each practice unit. This is supported by Qomar (2017), who stated that the vocabulary in a language is crucial for learning the language because it is an essential source of a student's ability to listen, speak, read, and write.

However, students also practice writing by paying attention to grammar and writing the correct words. This is in line with the findings of Syahputra (2019), who revealed that using Duolingo can reduce grammatical errors in writing. Thus, students are considered capable of writing if the aspects of writing are met, namely compiling an entire organization, paying attention to combinations between sentences to form a complete paragraph unit, and using appropriate vocabulary, grammar, and mechanics (Lestari, 2017). This is supported by research from Utami (2020) clarifies that in her findings, Students can quickly know and memorize vocabulary, better pronunciation, better grammar rules, and students easily master English skills.

## CONCLUSION

Based on the findings described above, it can be concluded that there was simultaneously effect of Duolingo on students' vocabulary mastery and writing competence of 8<sup>th</sup> grade in SMPN 1 Singaraja, there was a significant effect of Duolingo on students' vocabulary mastery of 8<sup>th</sup> grade in SMPN 1 Singaraja, and there was a significant effect of Duolingo on students' writing competence of 8<sup>th</sup> grade in SMPN 1 Singaraja.

In connection with the results of this study, it can be suggested that teachers use Duolingo as a learning medium for improving students' vocabulary mastery and writing competence in teaching and learning at school. This is because students feel motivated to participate in learning. In addition, students also feel comfortable learning English because using Duolingo is like playing a game. Researchers who want to do similar research can follow this research as a reference or add new and lacking things from this research. Finally, the researcher hopes that this research can be helpful for the author himself and other readers so that, in the future, they can improve and develop better use of learning media, especially Duolingo.

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