

CHAPTER 3

RESEARCH PROCEDURES

3.1. Research Methodology

In conducting this research, the writer used an experimental method. Sugiyono (2019) stated that experimental research is one of the quantitative methods used by the author to analyze the effect of independent variables on dependent variables. In this study, the researcher wants to ascertain the effect of using the Duolingo application on the vocabulary of secondary school students.

3.2. Research Design

A quasi-experimental non-equivalent control group design with two groups was utilized in this study. A genuine experiment pre-test and post-test control group design is comparable to a non-equivalent control group design. However, Sugiyono (2019) stated that the experiment and control class were not chosen at random in the non-equivalent control group design.

Table 3.1 Research Design

Experimental Group	Pre-test	Treatment	Post-test
Control Group	Pre-test		Post-test

3.3. Research Variables

Generally, the variable is an object which becomes the focus of the research. There are two variables in this research, as follows:

1) Independent Variable

The independent variable is the variable that affects other variables (Sugiyono, 2019). The independent variable in this research is Duolingo, which is symbolized by X.

2) Dependent Variable

The dependent variable is the variable that gets the effect of the independent variable (Sugiyono, 2019). The dependent variable in this research is the students' vocabulary mastery, which is symbolized by Y.

3.4. Population and Samples

The population was all subjects that were observed. Bryman et al. (2022) stated that the population is the whole element from which the researcher draws the sample, while the sample is part of the population chosen to represent the group or unit of study as a whole. In this study, the population of this research was all of the ninth-grade students at one of the junior high schools in Tasikmalaya, consisting of eleven classes with a total of 32 students each. Random sampling is a sample selection process in which each individual in a predefined population can be selected into the sample with equal and independent probability (Gay et al., 2012). Based on the random sampling method, the researcher selected 2 classes as samples for this study using a random sampling technique. First, teachers were asked to provide a list of classes that had similar academic characteristics, such as average vocabulary test scores and number of students. The list of classes selected by the teachers was then further examined, and 2 classes were randomly selected from the list using the random number generator method. The selection process starts by writing down the numbers 1 to 13, as there are 13 classes available. Next, two random numbers were generated, namely numbers 4 and 6, which corresponded to classes IX-D and IX-F as the classes selected to be sampled in this study, class IX-D was selected as the experimental class and class IX-F was selected as the control class. Therefore, the researcher used this technique for this research, and the sample of this research was the ninth grade of one of the junior high schools in Tasikmalaya, consisting of 2 classes with a total of 32 students each, which were chosen randomly.

3.5. Data Collection

Each study always requires an instrument to collect the data. Then, in this study, the data were collected by using tests. The test used multiple-choice (10 items) and matching items (10 items). The test was given to the students twice, before and after the treatment (pre-test and post-test). A pre-test was used to get data about their vocabulary mastery before the treatment. At the same time, a post-test was used to get data about their vocabulary mastery after the treatment.

3.6. Research Instrument

In conducting the research, an instrument was necessary, which was used as a research tool for collecting the data related to the research problems. In this study, an objective test was used as an instrument, but its validity and reliability were examined before the test was given. The questions are prepared based on the material contained in Duolingo, as well as several other references from the internet.

3.6.1. Validity Test

Before the instrument was examined by the sample, it was first tested for its validity. Burns (2003) stated that validity is an important criterion for assessing the quality and acceptability of a study. By testing the validity at first, the instrument was expected to measure what should be measured.

Validity was assessed to determine whether the instrument. The researcher gave the vocabulary test to a non-sample; it was an IX-A class. To know if the test is valid or not, the researcher compared the r observed (Pearson correlation) and r table $df-2$ ($32-2 = 30$) = 0.349. If r is observed $> r$ table, the test is valid. Meanwhile, if r observed $< r$ table, it means the test is not valid.

After analyzing the validity, there were 12 questions that are valid for multiple choice; there are numbers 1, 2, 8, 9, 10, 12, 13, 14, 18, 19, 23, and 25. There were 14 questions that were valid for matching items: 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 18, and 20. Additionally, the researcher used only ten questions of multiple choice and ten questions of matching items for the pre-test and post-test to be given to the control and experiment class.

3.6.2. Reliability Test

After the validity test was done and declared valid, the instrument was tested for its reliability, with the hope that the instrument was trustworthy enough to be used as a data collection tool. The reliability test was the attribute of being consistent and trustworthy. A test would be reliable when it gave the same repeated result under the same conditions. Moreover, it was stated that reliability referred to the consistency of the score obtained.

To determine whether the test was reliable or not, the researcher compared Cronbach's Alpha score with the internal consistency of the reliability test provided by Streiner (2003), as cited in Jugessur (2022). It was seen that Cronbach's Alpha is 0.805, which means this test is categorized as good. In conclusion, there are 24 questions that are valid, and this test is reliably categorized as good and could be used as an instrument.

Table 3.2 Reliability Test Result

Reliability Statistics	
Cronbach's	
Alpha	N of Items
.805	45

Table 3.3. Level of Reliability Test

Category	Range
$\alpha \geq 0.9$	Excellent (High stakes testing)
$0.7 \leq \alpha < 0.9$	Good (Low stakes testing)
$0.6 \leq \alpha < 0.7$	Acceptable
$0.5 \leq \alpha < 0.6$	Poor
$\alpha < 0.5$	Unacceptable

3.7. Data Analysis

The data that had been collected from the test were analyzed. The data for this research were obtained from pre-test and post-test. Each question answered correctly is given a score of 1, and each question answered incorrectly is given a score of 0, so the maximum score is 20.

$$\text{The students' test score} = \frac{\text{The obtained score}}{20} \times 100$$

To analyze the data, the researcher did descriptive statistics, normality test, homogeneity test, and independent sample t-test by using IBM SPSS Statistics 24.

3.8. Steps of the Research

Table 3.4. Steps of the Research

Identifying the Problem	The researcher is concerned about students who have gaps in vocabulary acquisition. Observations of some junior high school students revealed that most students find it difficult to learn English and lack motivation. Mostly, several schools now allow students to bring their own smartphones, which can only be used in class or during breaks. The researcher has been using the Duolingo app since 2022 and finds it interesting and useful for learning English, as it provides various pictorial exercises, such as guessing the meaning of words, pronouncing words, and filling in the blanks. Therefore, the researcher is interested in investigating the effectiveness of using Duolingo as a means to teach vocabulary to junior high school students. By introducing this app, the researcher hopes to make learning English more fun for the students and make it a new experience for them as part of their learning activities.
Literature Review	The researcher collected information relevant to the research topic, namely vocabulary acquisition and Duolingo

	usage. Reference materials were obtained through Google Scholar and online searches of several books and journals.
Identifying the Hypothesis	Alternative Hypothesis (H_a): There is an influence of using Duolingo on students' vocabulary mastery of ninth-grade students in one of the junior high schools in Tasikmalaya. Null Hypothesis (H_0): There is no influence of using Duolingo on students' vocabulary mastery of ninth-grade students in one of the junior high schools in Tasikmalaya.
Collecting the Data	The researcher conducted a pre-test on the experimental class and control class to ascertain their initial knowledge. In the experimental class, the researcher used Duolingo to conduct learning activities. In the control group, the learning was conducted in a traditional way using PowerPoint. After the treatment period of approximately three weeks (six meetings), the researcher gave a post-test to measure students' vocabulary mastery.
Analyzing the Data	To analyze the data, the researcher used IBM SPSS Statistic 24. First, the researcher did a normality test. Second, the researcher did a homogeneity test.

	Last, the researcher did an independent sample t-test.
Conclusion	Duolingo influences junior high school students' vocabulary mastery.

3.9. Time and Place of the Research

This research was conducted in one of the junior high schools in Tasikmalaya and was started from August 2024 until September 2024.

Table 3.5. Timeline of the Research

Description	Sept/ 2023	Oct/ 2023	Nov/ 2023	Dec/ 2023	Oct/ 2024	Nov/ 2024	Dec/ 2024
Research Proposal Writing							
Research Proposal Examination							
Data Collection							
Data Analysis							
Report							
Thesis Result Seminar							
Thesis Examination							