CHAPTER III

RESEARCH METHOD

This chapter outlines the research design, population and sample, research instruments, data collection techniques, the process of data collection, and data analysis techniques.

A. Research Design

Based on the views of Creswell (2009), quantitative research methods include testing specific hypotheses and theories by examining the relationships among variables using statistical tools. This study employed an experimental method with a quantitative approach and utilizes a quasi-experimental design with a pre-test and post-test. Quantitative research is about explains phenomena by collecting numerical data that are analyzed using mathematically based methods, particularly statistics, (Creswell, 2009). To assess the effectiveness of using the WordUp application on the vocabulary mastery of tenth-grade students, two classes that had been predetermined by the school were selected, and according to the teacher's information, both classes had relatively similar abilities. This study divided participants into two groups: a control class and an experimental class. Both classes were given a pre-test and a post-test to measure their vocabulary improvement. The experimental group received treatment using the WordUp application, while the control group used a printed dictionary.

B. Population and Sample

The study was conducted at 10th-grade students at SMAN 6 Kediri in the 2024/2025 academic year. Therefore, the population was 12 classes at the 10th-grade level with approximately 408 students in total. The selection of this school was based on the fact that the students are familiar with the application. Therefore, this school was chosen as the research location. From the population, two classes were chosen as the samples. It means that the samples were class X1 and X2, that consisting of a total of 30 students per class. The sampling technique used in this research is purposive sampling (non-random sampling). The study did not randomly select samples but rather took samples from groups that had been predetermined. The study employed a non-equivalent control group design to compare the control class with the experimental class. In this design, both classes were given pre-tests and post-tests to assess their vocabulary mastery before and after the treatment. According to Sugiyono (2018), the non-equivalent control group design is a quasi-experimental method where the experimental and control groups are not randomly assigned; instead, pre-existing groups are used, and measurements before and after treatment help determine the effect of an intervention. This design allows researchers to evaluate the impact of an educational treatment while accounting for initial differences between groups.

C. Research Instrument

The same method of measurement was applied to gather and assess data from respondents using research instruments. These instruments are tools that help researchers conduct their research activities in a more organized and

efficient way. In this study, the author used pre-tests and post-tests to assess the effectiveness of using WordUp in students' vocabulary mastery, which was administered in two classes. The pre-test was given before the author started the treatment. Meanwhile, the post-test was given after the author provided the treatment to determine the improvement in students' vocabulary mastery. The pre-test and post-test were in multiple-choice format and consisted of 30 items.

1. Test

Tests are an effective tool for assessing students' abilities and knowledge in specific areas. According to Brown (2007), tests are used to evaluate students' learning achievements and can provide information about their vocabulary proficiency. In this study, the researcher used tests to assess students' vocabulary proficiency through pre-test and post-test methods applied to a single group.

a. Pre-test

The main goal of the pre-test was to identify the baseline level of the outcome variable that the intervention aimed to improve. In this study, a multiple-choice test was used, with questions focusing on vocabulary found in report texts. During the initial session, students in the experimental class took the pre-test to assess their English vocabulary skills before using the WordUp application. Students in the control class also completed the pre-test as part of the research procedure.

Table 3.1 Blueprint of Pre-Test

Material	Indicator	type of question	Number question
Information about vocabulary in report text	Students are able to identify the vocabularies of adjectives, verbs, and nouns in report text.	Multiple choice	2,4,8,10,12,14,20,24,27,28
	Students are able to understand the meaning of vocabularies of adjectives, verbs, and nouns in report text.		1,5,6,9,13,17,18,19,22,25,26,29
	Students are able to recognize antonyms in the context of adjectives, verbs, and nouns in report text.		3,7,11,15,16,21,23,30

b. Post-test

This post-test was administered to both the control and experimental classes. In the experimental class, the post-test aimed to gather data on students' vocabulary skills following the use of the WordUp application. In this study, the test format used was multiple-choice, with questions related to vocabulary found in report texts. The post-test was administered to both the control and experimental classes using the same format and level of difficulty as the pre-test to ensure an accurate measurement of vocabulary mastery. However, the post-test differed slightly from the pre-test in terms of the vocabulary items presented, although it still focused on the same categories' nouns, verbs, adjectives, meanings, and antonyms in the context of report texts.

Table 3.2 Blueprint of Post-Test

Material	Indicator	type of question	Number question
Information about vocabulary in report text	Students are able to identify the vocabularies of adjectives, verbs, and nouns in report text.	Multiple choice	2,8,15,19,20,24,25,29
	Students are able to understand the meaning of vocabularies of adjectives, verbs, and nouns in report text.		1,4,5,6,11,13,16,17,18,21,22,27
	Students are able to recognize antonyms in the context of adjectives, verbs, and nouns in report text.		3,7,12,14,23,26,28,30

2. Validity and Reliability

In conducting research, it is essential to ensure that tests are both valid and reliable so that the results are accurate and consistent. Validity and reliability act as key indicators in measuring the quality of research. Validity refers to how accurately and appropriately a research instrument measures what it is intended to measure. On the other hand, reliability relates to the consistency of the results when the same instrument is applied repeatedly to the same subject under similar conditions. Research findings are considered valid if the collected data truly reflect the actual conditions of the object being studied. Likewise, research is considered reliable if it produces consistent data over time.

The researcher evaluated the validity and reliability of the test items using SPSS software. Before conducting the actual test, a total of 80 questions were analyzed, consisting of 30 questions for the pre-test and 30 for the post-test. Out of these, 30 questions were considered valid for the pre-test, and another 30 were valid for the post-test. However, 20 questions did not meet the

validity standards. The table below presents the results of the reliability analysis for the test items. The validity test table can be found in the appendix.

Table 3.3 Result of Reliability test for Pre-Test

Reliability Statistics	
Cronbach's Alpha	N of Items
.928	30

The reliability test results were assessed using the Cronbach's Alpha coefficient, with values above 0.60 indicating that the items are consistent or reliable, and values below 0.60 indicating inconsistency or unreliability. In this study, the alpha coefficient obtained was 0.928, which is higher than 0.60. This result shows that the instrument is reliable and suitable for collecting data.

Table 3.4 Result of Reliability test for Post-Test

Reliability Statistics	
Cronbach's Alpha	N of Items
.955	30

The reliability test results were assessed using the Cronbach's Alpha coefficient, with values above 0.60 indicating that the items are consistent or reliable, and values below 0.60 indicating inconsistency or unreliability. In this study, the alpha coefficient obtained was 0.955, which is higher than 0.60. This result shows that the instrument is reliable and suitable for collecting data.

D. Data Collection Techniques

a. Pre-test

The test will consist of a series of exercises designed to measure students' English vocabulary skills. A pre-test will be given before the treatment is conducted. The purpose of the pre-test is to determine the students' initial ability in understanding the material. The test is in the form of multiple-choice questions, totaling 30 items that are appropriate for the students' level. The test covers four main topics: meaning, synonyms, antonyms, and vocabulary classification.

b. Treatment

After conducting the pre-test, the researcher administered treatment to the experimental class twice. The treatment involved using the WordUp application. The teacher presented the material on report text using a projector and discussed the vocabulary found in the report text together with the students. The teacher asked the students about the vocabulary present in the provided example of a report text. If the students were unable to answer, the teacher instructed them to open the WordUp application and study the vocabulary within the application. Finally, the teacher provides the student worksheet (LKPD) to assess students' understanding. Meanwhile, the control class did not receive treatment involving the WordUp application. The teaching method used in the control class was the conventional method using a printed dictionary.

Table 3.5

The Difference Between Students Activities of Control Group and Experimental Group

Experimental Group Using WordUp application	Control Group Using Printed Dictionary
• Greeting	• Greeting

• Getting class attention • The teacher explain about the learning media that used in teaching learning process • The teacher asks each student to download the WordUp application. • The teacher explains the steps to use the WordUp application. • The teacher explains the material about report texts and provides an example of a report text using a projector. • The teacher conducts a question-and-answer session about the underlined vocabulary found in the example report text. • The teacher and the students worked together to find the meaning of the underlined vocabulary on the WordUp application. • The students are divided into several heterogeneous study groups (each group consists of three students). • Next, the students work on a Student Worksheet (LKPD) provided by the teacher. The worksheet includes tasks such as finding the meaning, synonyms, antonyms, and classifying vocabulary using the WordUp application, then writing the results on the worksheet. • A representative from each group presents their group's worksheet results in front of the class. • The teacher provides feedback and evaluation for the students	• Getting class attention • The teacher explain about the learning media that used in teaching learning process • The teacher explains the material about report texts and provides an example of a report text using a projector. • The teacher conducts a question-and-answer session about the underlined vocabulary found in the example report text. • The teacher and the students worked together to find the meaning of the underlined vocabulary in the printed dictionary. • The students are divided into several heterogeneous study groups (each group consists of three students). • Next, the students work on a Student Worksheet (LKPD) provided by the teacher. The worksheet includes tasks such as finding the meaning, synonyms, antonyms, and classifying vocabulary using the printed dictionary, then writing the results on the worksheet. • A representative from each group presents their group's worksheet results in front of the class. • The teacher provides feedback and evaluation for the students

c. Post-test

The post-test is conducted after the treatment had been given. Its purpose

was to measure the students' abilities and to determine whether there was

any improvement following the treatment. The results of the post-test were used to help answer the research questions in this study. The test format was the same as the pre-test, including the level of difficulty and the number of items. This test focused on four main topics: meaning, synonyms, antonyms, and vocabulary classification.

E. **Technique of Data Analyses**

The researcher conducted a quantitative data analysis in this study. A comparison of the pre-test and post-test results was used to determine whether there was a significant difference in students' scores before and after using the WordUp application in vocabulary learning. According to Creswell (2009), data analysis is the stage performed after data collection to test hypotheses and draw research conclusions. In experimental research, data analysis is a crucial stage in determining the effectiveness of the given treatment.

After collecting the pre-test and post-test data, the researcher compared the pre-test and post-test scores of the experimental and control groups. The obtained data were analyzed using the Analysis of Covariance (ANCOVA) method with a significance level of 5%. The use of ANCOVA aims to determine the mean score differences between the experimental and control classes after controlling for the covariate variable. Furthermore, before conducting the main analysis, prerequisite tests were carried out, including the normality test, homogeneity of variance test, homogeneity regression test, and linear relationship test between the covariate and dependent variable.

1. ANCOVA (Analysis of Covariance)

    The researcher employed ANCOVA because the sample in this study was not randomly selected. Data analysis was performed using the SPSS version 23 software. The primary objective of this analysis was to determine the effectiveness of using the WordUp application in students' vocabulary acquisition compared to conventional learning methods. This statistical test was used to assess whether there was a significant difference between the two groups after the treatment.

    The decision-making criteria for this test are as follows:

    H0 is accepted, and H1 is rejected if the Sig. value > a (0.05).

    H0 is rejected, and H1 is accepted if the Sig. value < a (0.05).

2. Hypothesis Testing

    The hypotheses tested in this study are based on the initial assumption as follows:

    a. Alternative Hypothesis (Ha): The use of the WordUp application results in differences in students' vocabulary acquisition if the Sig. value < a (0.05). This indicates that the null hypothesis (H0) is rejected and the alternative hypothesis (Ha) is accepted. Therefore, it can be concluded that the WordUp application is effective in improving students' vocabulary acquisition. This is evidenced by a significant difference between the experimental and control groups.

    b. Null Hypothesis (H0): If the Sig. value > a (0.05), then there is no differences in students' vocabulary acquisition due to the WordUp application, meaning the null hypothesis (H0) is accepted and the

alternative hypothesis (Ha) is rejected. This implies that the use of the WordUp application is not effective in improving students' vocabulary acquisition. This conclusion is supported by the insignificant difference in scores between the experimental and control groups.

Therefore, this analysis aims to provide empirical evidence regarding the effectiveness of the WordUp application in improving students' vocabulary acquisition through a systematic and structured experimental approach.