

CHAPTER III

RESEARCH METHODOLOGY

This chapter presents place and time of the study, research design, population and sample, data collection, data analysis and research procedure.

3.1. Place and time of the study

This study took at MTs Al - Abrar Sihuik Huik. It is located in jln. Desa Siondop Julu, Kec. Angkola Selatan , Kab Tapanuli Selatan , Prov. North Sumatra 22714, Indonesia. This study was conducted over a series of six school meetings.

3.2. Research Design

In this study, a quantitative research approach was employed, along with a quasi-experimental design and a pre-test post-test control structure. The reason for choosing a quasi-experimental design was to effectively determine how the independent variable influenced the dependent variable, aligning with the primary objective of assessing the impact of the Hello Talk application on students' vocabulary mastery.

The research participants were divided into two groups: an experimental group and a control group. Both groups initially took a pre-test to establish their baseline vocabulary skills before any intervention. Subsequently, the experimental group used the Hello Talk Application with guidance from the researcher, whereas the control group received instructions from the researcher but did not use the app. To gauge the effectiveness of the Hello Talk Application, both groups underwent a post-test after the intervention. In simpler terms, this study used a specific research design to investigate how using the Hello Talk Application affected students' vocabulary learning.

**Table 3.1 Quasi-Experimental Design:
Pre-test and Post-test Design**

Group	Pre – test	Independent variable	Post- test
Experimental	✓	✓	✓
Control	✓	✗	✓

3.3. Population and sample

3.3.1. Population

Population is the complete set group of items on which generalization can be made. Students of the seventh-grade middle school was the population for this specific research. This exact group was purposely chosen because some kind of research gap was identified in this particular population. The research was conducted at MT's Sihuik Huik during the academic year 2023/2024. As Sotherland mentioned, the students were getting easily bored and not so active in learning process. So, it prompts the researcher to find innovative ways to make learning easy and enjoyable. In comparison to their seniors of eighth grade and ninth grade, the seventh grade in junior high school was found more focused and they had topic which significantly contributed to vocabulary mastery. The topic was chosen as a teaching material by the researcher. Two study involved two classes of seventh-grade student, with details provided in the following tables. There were 2 classes of the seventh grade students with a total of following table.

Table 3.2

The population of the study

No.	Class	Number of the students
1.	VII-A	20
2.	VII-B	20
Total		40

3.3.2. Sample

A sample typically represents a segment of the overall population and is usually composed of smaller groups that the researcher observes. In this particular case, the researcher employed cluster random sampling to divide the population into two separate groups.

- a. Experimental class : a group of students who will learn vocabulary using the Hello Talk application.
- b. Control class : a group of students who will receive vocabulary instruction without the use of the Hello Talk application.

According to Donald Ary, when it's really hard to list every single person in a large population, researchers can use cluster sampling to select a more manageable group. This group is made up of individuals who share certain characteristics relevant to the study.

In this particular case, the researchers looked at some initial data from the school and noticed that Class VII-A and Class VII-B had similar learning outcomes. This similarity was important for the research because the researchers needed two groups that they could compare to understand the impact of the Hello Talk Application. So, they decided to use these two classes as their research sample, and this decision was made after talking with the seventh-grade English teacher. There were a total of 40 students, with 20 in each class – Class VII-A served as the experimental group, and Class VII-B was the control group. We can see from the table above :

Table 3.3
The sample of the study

Class	Population	Sample
Experiment class (X)	VII A	20
Control class (Y)	VII B	20
Total		40

3.4. Instrument of the study

In this context, the instrument can be defined as a tool like tests and questionnaires which used to social and natural phenomena and also store data during the research process. In this study test is the instrument which used as a tool to evaluate vocabulary mastery of students. Test is easy to design, fun to attempt, scorable and simple vocabulary type. Above characteristics are the reasons behind choosing test as instrument. Additionally, the researcher selected standardized published test which are skill fully crafted and developed by the experts in accordance with broad academic objectives found in most educational system. These tests are widely used to measure students' improvement. With the help of Hello Talk Application, the researcher will test students two times: pre-test and post-test. The test included 20 multiple-choice questions for each student. These questions were transformed into pen-paper test format, so that students don't need to use Hello Talk Application. It was also ensured that test was not accessible to the students although they have downloaded it by using locked lesson exclusively for VIP members only.

The pre-test happened before any teaching or the introduction of the Hello Talk Application. It aimed to gauge what the students already knew about vocabulary and how well they could acquire it initially. The post-test took place in both the control and experimental groups but occurred after they had experience with the Hello Talk Application. Its purpose was to compare the results between these two groups and see how they differed, helping us understand the impact of the application on vocabulary learning.

3.5. Technique of data collecting

In this study, both the control and experimental classes were subjected to two vocabulary tests related to the Hello Talk application. Although the pre-test and post-test had different questions, they still had the same structure and the same number of questions. The steps are follows:

3.5.1. Pre- test

As outlined by Creswell, the pre-test in this study was used to measure specific characteristics chosen by the researcher for the participants before any treatment was administered. This pre-test included 20 multiple-choice questions, with each correct answer earning a score of 5. Thus, if all answers were correct, students could achieve a maximum score of 100. The identical pre-test was administered to both classes. The pre-test had a dual purpose: first, to assess the consistency of English language skills among students, and second, to gauge their existing vocabulary knowledge.

3.5.2. Treatment

After conducting the pre-test, the researcher initiated the teaching process in both the experimental and control classes. In the experimental class, the Hello English app was employed as a teaching aid, while the control class did not utilize the Hello Talk app throughout the teaching and learning phase.

3.5.3. Post-test

The post-test examined certain traits or features for experiment participants following the administration of the treatment, much like the pre-test did. There were 20 multiple-choice questions on it. The post-test kept the same structure and characteristics even if the content was different from the pre-test. A maximum score of 100 could be achieved by successfully answering every question, for which a score of 5 was awarded for each correct response. The goal of the post-test was to evaluate the students' vocabulary progress after the intervention.

3.6. Technique of data analysis

Following the data collection, the researcher proceeded with data analysis. The data from the tests in this study were automatically computed and analyzed using Excel and SPSS software version 20, with a significance level set at 0.05. The data analysis process encompassed several distinct components :

3.6.1. Preliminary analysis

After collecting the data, an initial examination was performed to ascertain if the data were appropriate for hypothesis testing through the t-test. This preliminary assessment encompassed two tests: one for verifying normality and the other for evaluating homogeneity. These assessments were conducted automatically with SPSS version 23. It was deemed that the data conformed to a normal distribution and were homogenous when the significance level (Sig.) exceeded 0.05.

a. Normality Test

The purpose of the normality test is to determine whether or not the data from the experimental and control groups are normally distributed. The Lilliefors method was used by SPSS version 23 to perform the normalcy test. This test has the following requirements: if the significance scores of (Asymp. Sig. 2 tailed) > 0.05 , then the distribution of the data is normal; otherwise, the distribution of the data is not normal.

To count the normality test, the researcher used SPSS with steps as follow : Open SPSS program.

1. Enter all the data.
2. Go to the top menu and select "Analyze." Then, choose "Descriptive Statistics" and click on "Explore."
3. Transfer the data from the left box to the "Dependent List."
4. Click on "Plot" and ensure that, under the boxplots option, nothing is selected. Clear any checkboxes under "Descriptive" and check the box for "Normality plots with tests." Remove any checks under "Spread vs Level with Levene Test."
5. Click "Continue" and then click "OK."

b. Homogeneity Test

The purpose of the homogeneity test was to establish whether the data from both groups exhibited similar variations.

This homogeneity test was conducted using SPSS version 23 as well. To achieve homogenous data, it was necessary for the test's significance level to exceed 0.05.

Here are the steps :

1. Launch the SPSS software.
2. Enter the data in the data view.
3. Navigate to the top menu and select "Analyze." Then, choose "Compare Means" and click on "One-Way ANOVA."
4. Transfer the data from the experimental group to the "Dependent List" and the data from the control group to the "Factor."
5. Click on the "Option" tab to access the options dialog box.
6. Check the box for "Homogeneity of Variance Tests."
7. Click "Continue" and then press "OK."OK.

3.6.2. T-Test

The researcher aimed to assess if the Hello Talk application had an observable impact on the vocabulary skills of seventh-grade students at MTs Al-Abrar Sihuik Huik during the 2023/2024 academic year. This evaluation involved gathering data through pre-tests and post-tests administered to both the control and experimental groups. To analyze the data and make decisions about accepting or rejecting hypotheses, the researcher utilized the t-test within the SPSS version 20 software. The t-test is a statistical tool used to ascertain whether the means of two sample groups differ significantly from each other.

Here are some steps :

1. Begin by opening the SPSS program.
2. Access the "Variable View" and label the first row in the "Name" column as "score" and the second row as "class."
3. In the "Label" column, provide the label "score" for the first row and "class" for the second row, both in English.
4. In the "Value" column, select the second row, enter "1" in the "Value" box, and label it as "experimental class" in the "Value Label" box. Then, click "Add" and confirm with "OK."
5. Proceed to the data view and input your data.
6. Return to the main menu and click on "Analyze." From there, select "Compare Means" and choose "One-Way Independent Sample T-Test."
7. Transfer the data related to the experimental group to the "Test Variable" and the data concerning the control group to the "Grouping Variable."
8. Click on "Define Group" and input "1" in the "Group 1" column and "2" in the "Group 2" column.
9. Continue with the analysis by clicking "Continue," and when you're ready, finalize the process by clicking "OK."

3.6.3. Hypothesis test

Statistical hypothesis applied in order to know the result of the observation about the sample. The criteria were as follows:

Ha is accepted if $t_0 > t_{table}$ with the Sig. (2- tailed) 5 % < (0.05)

Ho is accepted if $t_0 < t_{table}$ with the Sig. (2- tailed) 5 % (00.5)

The hypotheses of the study were :

a. Alternative Hypothesis (Ha) :

There is a significant difference in the level of vocabulary knowledge among the students. Between students who are taught using the Hello Talk program and who are taught without using Hello Talk application.

b. Null Hypothesis (Ho) :

There is no significance different of students' vocabulary mastery between students who taught by using Hello Talk application and students who ate taught with using Hello Talk application.

3.6.4. Effect size

To assess the extent of the effect of variable X on variable Y, the researcher calculated the effect size after completing all the analysis tests. The researcher employed Cohen's theory to determine the effect size in this study. The formulation is as follow :

$$\sigma = \frac{(SD1 + SD2)}{2}$$

σ = pooled standard deviation

SD_1 = standard deviation of experimental group

SD_2 = standard deviation of controlled group

$$d = \frac{M1 - M2}{\sigma}$$

d = the effect size

$M1$ = Mean of experimental group

$M2$ = Mean of controlled group

The criteria of the effect are $0.2 \geq$ small effect ; $0.5 \geq$ modest effect size ; $1.00 \geq$ moderate effect size ; $1.00 <$ strong size.

3.7. Validity and Reliability of Data

Validity Validity is a critical factor in educational testing, and it plays a crucial role in ensuring that research is accepted and meaningful. According to Ary, validity indicates the extent to which test scores provide meaningful and appropriate interpretations. On the other hand, reliability pertains to the consistency of students' scores when they take the same test multiple times. A test is considered reliable if it consistently produces similar results when used under the same conditions on different occasions.

In this particular study, the researcher employed a test within the Hello Talk application. This test was standardized, meaning it had established comparative norms, and its validity and reliability had already been confirmed. Additionally, standardized tests like this one come with clear guidelines for administration and scoring. Therefore, the researcher had confidence in the test's validity and reliability, given that it was an official educational learning application.

Furthermore, the researcher selected this test based on its alignment with the study's intended purpose and its direct connection to the curriculum that the students had been exposed to.exposed.