

CHAPTER III

RESEARCH METHODS

3.1 Place and Time of Research

This research was conducted at SMP Al-Hikmah Rokan Hulu, school located on Suka Maju village, East Tambusai sub-district, Rokan Hulu district. This research was conducted on august 2022 academic year.

3.2 Population and Sample

3.2.1 Population

Population is the total number of research objects, where the subject was a group of people, in this study the researcher draw conclusions after the research was carried out (Syaukani, 2020), population is something that refers to all certain human groups, not geographic areas, times or units, the population of this study were student seventh grade of SMP Al-Hikmah with the total of 17 students. As in the table below:

Class	The Number of student
VII	17

3.2.2 Sample

Sample is part of the population, it done by a sampling technique. Based on the opinion of Husain & Purnomo (2001) in Hardani et al. (2020) the sample must really be able to describe state of the population, the meaning that the conclusions drawn by the sample must be the conclusions of the population. In this study, the sample of this research were all of member in class which sample selection technique used total sampling, because if population member under 100 it was done by total sampling (sugiyono, 2019)

3.3 Research Methods and Procedures

3.3.1 Research methods

In this study was used a Quantitative approach, this research emphasizes the numerical analysis of data (numbers) processed by statistical methods. In this study, the researcher was used pretest - posttest one group design, pretest before give the treatment and posttest after given the treatment. Thus the results of the treatment known more accurately because it was compared with the situation before being treated (sugiyono 2019)

Research design model is as follows:

$$O_1 \quad X \quad O_2$$

Group	Pre-test	Treatment	Post-test
One group	O1	Verb Alphabet peg System (multiple choice completion)	O2

Information:

O1 : Pre-Test (before treatment)

X : Treatment

O2 : Post-Test (after being treated)

3.3.2 Procedure of Research

a. Pre-test

The pre-test was given to the student before doing the treatment. It aims to determined students' basic ability in vocabulary before given verb alphabet peg on mnemonic technique.

b. Treatment

In this study, there one group that were taught, namely all of member in class, a group was taught mnemonic technique on verb alphabet peg system.

c. Post-test

The post-test was given to the student after treatment finished. The purpose of post test is to measure the effect of mnemonic technique on verb alphabet peg system by looking at the students' post-test score. The test used in this post-test was multiple choices which consisted of some number of questions.

3.4 Research Instruments

Instrument is a tool was used as an attempt to state the aspect to be investigated in the study. In this study, the instrument as follows:

a. Test instrument

Students' abilities were measured through student memory. In this study, question were ask before learning as a pre-test to determine the students' initial abilities and after learning as a post-test to determine students' ability after given treatment. The question were multiple choice completion by 4 alternative answers a, b,c,d. the number question in this test were 20 question in pre-test and post-test itself.

3.5 Data Analysis Technique

In the research that the data was collected through the pre-test and post-test as follows:

$$S = R/N \times 100$$

Information:

S: Score

R: Student answered correctly

N: Number of items

3.5.1 Validity test

The type validity in this research was used content validity (Point Biserial). This is to compare between content instrumen with lesson material that was taught. To know the validity of each item test, it by following the formula:

$$r_{pbi} = \frac{Mp - Mt}{SD_t} \sqrt{\frac{p}{q}}$$

r_{pbi} = coefficient correlation of point biserial

M_p = mean of true answer

M_t = mean of total score

SD_t = standard deviation of total score

P = students proportion who answer true

q = students proportion who answer false

Point Biserial Criteria:

- If value R Count > R table so, the conclusion is valid
- If value R Count < R table so, the conclusion is not valid

3.5.2 Reliability test

Reliability is stability or constant of the test scores. Reliable research result state there are similarities in data at different times. If yesterday's object was red, then today and tomorrow it still being red. It was calculated by following the Cronbach Alpha formula:

$$r_{11} = \left(\frac{k}{k-1} \right) \left(1 - \frac{\sum \sigma_b^2}{\sigma_t^2} \right)$$

r_{11} = Cronbach Alpha Reliability

k = Number of item test

$\sum \sigma_b^2$ = number of item variant

$\sigma_t^2 =$ total variant

Cronbach Alpha criteria

- If value Cronbach alpha $> 0,60$ so, the conclusion are reliable
- If value Cronbach alpha $< 0,60$ so, the conclusion are not reliable

3.5.3 Normality Test

Normality test is to know the data from the sample in a normal distribution or not. In this research the normality test was used Kolmogorov Smirnov test to get the normality of the data, after get normality it was compared to 0,05.

If *value sig.* $> 0,05 =$ data are normal

If *value sig.* $< 0,05 =$ data are not normal

3.6 Statistical Hypothesis

To find out the t statistic hypothesis, the researcher used paired sample T-test statistical analysis. The formulation of the "t" test as below:

$$\frac{Md}{\sqrt{\frac{\sum x_d^2}{N(N-1)}}}$$

Md : Mean of pre-test and post-test

d : Result (post-test- pre-test)

Xd : Deviation of each subject

Xd² : Sum of squares deviation

N : Subject on sample

db : Determined by N-1

So, based on the hypotheses described above, the statistical hypothesis below is: whether H_a is accepted or not based on the number of significant figures contained in the output table of the regression calculations as follows:

Paired Sample T-test:

1. If the value of the significant number is less than 0.05 at the 95% confidence level ($p < 0.05$), then H_a is accepted and H_0 is rejected.
2. If the value of the significant number is greater than 0.05 at the 95% confidence level ($p > 0.05$), then H_0 is accepted and H_a is rejected.

Criteria:

- H_a = there is a significant difference between pre-test and post-test learning outcomes
- H_0 = there is no significant difference between pre-test and post-test learning outcome

