

CHAPTER III

RESEARCH METHODOLOGY

A. Time and Place of The Study

The writer held research at MTs N Sei Kanan jl.Sabungan kec. Sei kanan, Sumatera Utara. Academic year 2019/2020. The reason for choosing this school because:

1. Learning problem found this school.
2. The researcher wants give positive contribution to the students in this school especially to build up their vocabulary with spelling skill.

B. Population and Sample

1. Population:

The population of this research is the Eight Grade Students of MTs N Sei Kanan. The number of population were 155 students.

2. Sample:

The sample is class VIII C consisted of 32 students'. The sampling technique in this research was purposive sampling. The researcher took class VIII C because the students' vocabulary was very low in this class and the problem in class VIII C will in accordance with the title of the researcher.

C. Research Design

This research used was pre-experimental method. Pre-experiments are the simplest form of research design. In a pre-experiment either a single group or multiple groups are observed subsequent to some agent or treatment presumed to cause change. The pre-experimental group will giving pre-test, treatment, and post-test.

This study uses a type of quantitative research with experimental methods. Quantitative research is methods for testing certain theories by examining the

relationship between variables. Variables are usually measured by research instruments so that data consisting of numbers can be analyzed according to statistical calculation procedures.¹

Research using quantitative data is known as quantitative research (data in the form of numbers or data collected). Quantitative research is also known as a method for obtaining knowledge or solving problems which is carried out carefully and methodically. The data obtained is in the form of a series of numbers.² Quantitative research can be interpreted as research based on the philosophy of positivism which sees based on the law of causality (cause and effect) and is rational or can be proven rationally, used to examine certain populations or samples, sampling techniques are usually random, and data collection uses instruments. The study of data analysis uses quantitative and statistical methods to test the proposed theory.³

This study used a pre-experimental design type one group pretest-posttest (single group pretest-posttest). One group pretest-posttest design is a research activity that provides an initial test (pretest) before being given treatment, after being given treatment then give a final test (posttest) in just one study group.⁴ In this design, the test was carried out twice, i.e. before being given treatment it is

¹ Adhi Kusumastuti dkk, (2020), *Metode Penelitian Kuantitatif*, Yogyakarta: CV Budi Utama.p.83

² Ananda Rusydi and Muhammad Fadhli, (2018), *Statistika Pendidikan: Teori Dan Praktik Dalam Pendidikan*, Cv. Widya Puspita.p.32

³ Ahmad Rangkuti Nizar, (2016), *Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif, PTK, Dan Penelitian Pengembangan*, Bandung: Citapustaka Media.p.30

⁴ Tri Hidayanti, Ita Handayani, and Ines Heidiani Ikasari, (2019), *Statistika Dasar Panduan Bagi Dosen Dan Mahasiswa*, *Journal of Chemical Information and Modeling*.p.98

called pre-test and after treatment it is called post-notes. The research pattern of the one group pretest-posttest design method according to Sugiyono is as follows:⁵

One group pretest-posttest design

<i>Category</i>	<i>Pretest</i>	<i>Treatment</i>	<i>Posttest</i>
<i>Experiment</i>	O_1	X	O_2

Information :

O_1 = experimental class pretest value

O_2 = posttest value of the experimental class

X = given treatment within a certain period of time

D. Instrument of Data Collection

Instruments are tools that are selected and used by researchers in their activities to collect data so that the research becomes systematic and facilitated by it⁶. In this study, the data collection instruments used were tests, interviews and documentation.

1. Test

The test is a comprehensive assessment of an individual or an entire evaluation effort⁷. The test is used to measure a person's abilities and achievements or accomplishments. The test instrument is used to see students' abilities in learning.

⁵ Sugiyono, (2017), *Metode Penelitian Kuantitatif, Kualitatif Dan R & D*, Bandung: Alfabeta,p.214

⁶ Nizar, *Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif, PTK, Dan Penelitian Pengembangan*.p.76

⁷ Andra Tersiana, (2018), *Metode Penelitian*. Yogyakarta: CV Budi Utama.p.65

Tests are given before starting learning (pre-test) and after learning (post-test). The test used in consisting of 25 questions.

2. Interview

Interviews are one way that can be used to collect accurate information from an informant⁸. In interviews, researchers collect information from respondents through verbal interaction. Previously the researcher prepared a list of structured questions related to research. Then the researcher met with the resource persons and asked questions. Tools and equipment that can be used during the interview period include tape recorders, paper, pens, laptops, and others.

3. Documentation

Documentation method is information that comes from important records either from institutions or organizations or from individuals⁹. Documentation of this research is taking pictures by researchers to strengthen research results. According to Sugiyono, documentation can be in the form of writing, pictures or the works of someone¹⁰. Documentation is data collection by researchers by collecting documents from trusted sources who know about source person.

⁸ Nana Syaodih Sukmadinata. (2010). *Metode Penelitian Pendidikan*, (Bandung: Remaja Rosdakarya).187

⁹ Nizar, *Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif, PTK, Dan Penelitian Pengembangan*.p.65

¹⁰ Sugiyono. (2013). 'Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif Dan R&D'.p.198

D. Technique of Analyzing Data

Data analysis begins with testing the statistical prerequisites needed as a basis for testing hypotheses, including normality and homogeneity tests, then testing the hypothesis according to the problem.

1. Normality test

Normality test is a test conducted with the aim of assessing the distribution of data in a group of data or variables that are normally distributed or not. The Normality Test is useful for determining the data that has been collected is normally distributed or taken from the normal population.¹¹ The data normality test was carried out using the Liliefors (Lo) test. The procedure for calculating the normality test with the Liliefors technique is:

- a) Determine the significance level (α), namely at $\alpha = 5\%$ or 0.05 with the hypothesis to be tested.
- b) Sort the data from the smallest to the largest data, then determine the absolute frequency and cumulative frequency (f_k).
- c) After that, we determine the average value and standard deviation of the data that has been obtained using the following formula:

$$\bar{x} = \frac{\sum x_i}{n} \text{ average formula}$$

$$s = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n-1}} \text{ standart deviation formula}$$

¹¹ (Nizar, 2015).p.76

d. determine the Z value (Z score) for each data or z_i value using the formula, namely :

$$Z_i = \frac{x_i - \bar{x}}{s}$$

Information :

x_i = score

\bar{x} = calculated average value (Mean)

s = standard deviation

- a. To determine $F(z_i)$ we use the values in the table Z. using a standard normal distribution list, we can calculate the probability of each of these standart numbers.
- b. Furthermore, to determine $S(z_i)$ the method used is to calculate the proportion of z_1, z_2, \dots, z_n which is smaller or equal to z_i , $S(z_i) = \frac{\sum Z \leq z_i}{n}$

Or we can use the cumulative frequency proportion based on the total number of frequencies.

$$S(z_i) = \frac{\text{Frekuensi kumulatif}}{n}$$

- c. Determine the calculated price of liliefors using the formula $|F(z_i) - S(z_i)|$, seen from this absolute value is the highest absolute value of the processed data.
- d. Then by talking the largest absolute value called liliefors observation (L_o).

By looking at the critical value of L or liliefors table (L_t) for n as many as the number of samples and the significance level is at $\alpha = 0,05$. It can be concluded: if the calculated L_o value $<$ from the L_o table value then H_0 is accepted with the conclusion that the data is normally distributed.

Meanwhile, if $L_o \text{ count} >$ from the L_o table value the H_0 is rejected with the conclusion that the data is not normally distributed.

2. Homogeneity test

The homogeneity test is used to determine whether the two classes, namely the experimental class and the control class, have the same variance or not. If the two groups have the same variance, then the two groups are said to be homogeneous. The homogeneity test aims to see whether the two samples have a homogeneous variance or not¹². Homogeneity test or F test is carried out by comparing the largest data variant divided by the smallest data variant, with the following steps :

- a) Determine the significance level $\alpha = 0.05$
- b) Find the variance of the two groups of data
- c) F test statistic formula

$$F_{\text{hitung}} = \frac{\text{varian terbesar}}{\text{varian terkecil}}$$

- d) Hipotesis Statistiknya

$$H_0 : \sigma_x^2 = \sigma_y^2 \quad \text{Artinya Varians data homogen}$$

$$H_1 : \sigma_x^2 \neq \sigma_y^2 \quad \text{Artinya Varians data tidak homogen}$$

- e) Determine the value of F_{hitung} by knowing in advance the variations of the two research groups. The calculated F_{tabel} by looking at the degrees of freedom (dk), namely to find out the largest variance is dk

¹²Zainal Arifin, (2014), *Evaluasi Pembelajaran*, Bandung: PT Remaja Rosdakarya.p.54

quantifier $n-1$ knowing the smallest variance is dk in the denominator $n-1$.

f) Test : $F_h < F_t$, then H_0 accepted

3. Hypothesis testing

After the prerequisite tests were carried out, namely the normality and homogeneity tests of the data population, then the hypothesis test was carried out. Hypothesis testing is related to the acceptance or rejection of a hypothesis¹³. In the two-mean difference test is done using the t test. The t test is used if both populations are normally distributed (estimated by sample) but have a homogeneous variance. The formula used for the -t is:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{s \sqrt{\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

$$\text{With } s = \sqrt{\frac{(n_1-1)s_1^2 + (n_2)s_2^2}{n_1+n_2-2}}$$

The information :

\bar{x}_1 = the average value of the experimental class

\bar{x}_2 = the average value of the control class

s_1^2 = experimental group variance

s_2^2 = control group variance

n_1 = number of experimental samples

n_2 = number of control samples

¹³ Hidayanti, Handayani, and Ikasari, LIII.

Test of criteria H_0 accepted when $t_{hitung} < t_{tabel}$ with opportunities $1 - \frac{1}{2}\alpha$ and $dk = (n_1 + n_2 - 2)$ dan rejected H_0 if t have other prices¹⁴. Statistical hypothesis in the first hypothesis is written as follows :

$$H_0 : \mu_1 = \mu_2$$

$$H_1 : \mu_1 \neq \mu_2$$



¹⁴ Nizar, *Statistik Untuk Penelitian Pendidikan*.