

CHAPTER III

RESEARCH METHOD

A. Research Design

Type of research design used in this research is survey design. Survey research is quantitative study using the same structured or systematic questions to many people, and then all the answers obtained by the researcher are recorded, processed and analyzed.¹

B. Location and Duration of The Research

The location chosen to research at SMPN 5 Pinrang. This study use survey design. The researches needed time to ask permission to carry out the research, choose the sample of the research, get data from the students and collect the data to complete the finding of this research. So, this study conducted for a few week.

C. Population and Sample

1. Population

The According to Sugyiono, Population is generalization that composed of subject or object that has certain qualities and characteristics of the applied researcher to learn then be concluded.²

The population of this research is whole of second grade students of SMPN 5 Pinrang. The total of the second grade students is 191 people.

¹Bambang Prasetyo & Lifna Miftahul Jannah, *Metode Penelitian Kuantitatif*. (Jakarta : Raja Grafindo Persada, cetakan ke-9 2004), P. 143

²Sugioyono, *Statistika Untuk Peneliti* (Bandung : Alfabeta, 2010), P. 61

Table 3.1 The total population of second grade students SMPN 5 Pinrang

NUMBER	CLASS	TOTAL
1	VIII-1	33
2	VIII-2	34
3	VIII-3	34
4	VIII-4	30
5	VIII-5	28
6	VIII-6	32
TOTAL		191

Source : Administration of SMPN 5 Pinrang

2. Sample

According to Sugyiono , the sample that is taken from population must be representative.³ The researcher used random sampling technique to determine the sample. The researcher will take 10 students each of class.

Table 3.2 The total sample of second grade students SMPN 5 Pinrang

NUMBER	CLASS	TOTAL
1	VIII-1	10
2	VIII-2	10
3	VIII-3	10
4	VIII-4	10
5	VIII-5	10

³Sugioyono, *Statistika Untuk Peneliti* (Bandung : Alfabeta, 2010), P. 62

6	VIII-6	10
TOTAL		60

Source : Administration of SMPN 5 Pinrang

D. Instrument of the Research

In collecting data, the researcher conducted test. The test give to the students. This research is collecting data by giving grammar tests to students. Aims to determine the students' ability in using personal pronoun in simple sentence. The form of the test used in this research is sentence which consist of 32 item, with 16 item of multiple choice 16 item of fill the blank and all of the sentence are simple sentence.

E. Procedure of Data Analysis

In collecting data, the researcher uses grammar test. First, the researcher explain how to work and time that give to the students. Second, the researcher distribute the instrument to the students. Third, the researcher ask the the students to do the test by theirself. Last, the researcher collected the data from the students answers.

F. Technique of Data Analysis

1. Descriptive Analysis

Descriptive statistics are statistics that are used to analyze data by describing or describing the data that has been collected as it is without intending to make general conclusions or generalizations.

2. Rasch Model

The Rasch model, named after Georg Rasch, is a psychometric model for analyzing categorical data, such as answers to questions on a reading assessment or

questionnaire responses, as a function of the trade-off between (a) the respondent's abilities, attitudes, or personality traits and (b) the item difficulty.⁴

If in classical theory the measurement process focuses on the visible score (x), in the Rasch model the data used is the probability score (P), which is the comparison between the correct answer and the number of questions given. The odds score is then converted into a systematic odds ratio, the odds ratio is expressed by the equation:

$$\text{Odds Ratio} = P / (N - P)$$

P = number of questions answered correctly (total score)⁵

N = total number of questions

Next, by entering the logarithmic function, the logit value (logarithm odd unit). Mathematically, logit is represented by the following equation:

$$\text{Logit} = \text{Log} (P / (N - P))$$

This value is called the logit or W-score or measure value. The logit value has been scaled and can be used for various analyzes.⁶ For dichotomous data, Rasch modeling combines an algorithm that states the results of the probabilistic expectations of item i and respondent n which are systematically stated as follow :

$$P_{ni} = (x_{ni} = 1 | \beta_n, \delta_i) = \frac{e^{\beta_n - \delta_i}}{1 + e^{\beta_n - \delta_i}}$$

⁴“Rasch Model”. *Wikipedia the Free Encyclopedia* .https://en.wikipedia.org/wiki/Rasch_model(accessed on November 30 ,2020)

⁵Bambang Sumintono & Wahyu Widhiarso, *Aplikasi Pemodelan Rasch : pada Assesment Pendidikan* , (Cimahi: Trim Komunikata, 2015), p. 38

⁶Hanif Akhtar “ *Berkenalan dengan Rasch Model* “<https://www.semestapsikometrika.com/2017/07/ber-kenalan-dengan-rasch-model.htm> (accessed on january 10th, 2021)

$P_{ni} = (x_{ni} = 1 / \beta_n, \delta_i)$ is the probability of respondent n in item i to produce the correct answer ($x_{ni} = 1$) with the respondent's ability β_n and the difficulty level of item δ_i .

This equation can be simplified by entering a logarithmic function and taking the form:

$$\text{Log}(P_{ni}(x_{ni}=1|\beta_n,\delta_i)) = \beta_n - \delta_i$$

In other words, the probability of a success can be written as the ability of the respondent reduced by the difficulty level of the item.

The advantage of rasch modeling over other methods, especially classical test theory, is the ability to predict missing data, which is based on a systematic response pattern. This clearly makes the results of the statistical analysis more accurate in the analysis of the results of the tests carried out. In other statistical models, it usually treats missing data with a value of zero (0), even if the percentage of missing data is high, the analysis cannot provide a satisfactory conclusion. However, given its predictive ability, rasch modeling will yield the best possible value from the missing data.⁷

⁷Bambang Sumintono & Wahyu Widhiarso, *Aplikasi Pemodelan Rasch : pada Assesment Pendidikan*, (Cimahi : Trim Komunikata, 2015), p. 46