

## **CHAPTER III**

### **RESEARCH METHODOLOGY**

In this chapter, the writer provides the procedures of the research in order to figure out the answer of the questions previously stated in chapter one. The writer presents the research design, research method, population and sample, instruments, data analysis, and research procedures.

#### **A. Research Design**

Research design as stated by Tavakoli (2012) in Kaswan and Suprijadi (2013: 9) refers to:

A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose. In fact, the research design is the conceptual structure within which research is conducted; it constitutes the blueprint for the collection, measurement, and analysis of data. In the other hand, the design includes an outline of what the researcher will do form the formulation of the research questions and hypotheses to reporting the research findings.

The research design of this research used quasi experimental research design. According to Ary, Jacobs & Razavieh (2006: 325) “experimental research design is enable the writer to estimates the effect of an experimental treatment.” Besides of that, Ary, Jacobs & Razavieh (2010: 302) state that there are many kinds of experimental research design, such as pre experimental, true experimental, factorial experimental, and quasi experimental. According to Hanafi (2011: 175) Quasi-experimental design means that there are two groups in the study; experimental group and control

group, in which both of the groups are the same level of knowledge but used different treatment.

Additionally, McMillan, et al (2006) believes that:

Quasi experimental design is to determine cause and effect between the independent and dependent variable. A common situation for implementing quasi-experimental study involves several classes or schools that can be used to determine the effect of curricular materials or teaching methods.

The writer applied quasi experimental design in this research, which the objective is to find out the differences between students who were taught by using cooperative learning type picture and picture and those who were taught by using scientific approach in teaching writing recount text.

Beside of the experts above, the writer showed the comparison classes. There were two classes in this research: experimental class and control class. The experimental class was given treatments by using cooperative learning type picture and picture and the other class was taught by using scientific approach that was not using the pictures. Before giving treatments in experimental class and control class, the writer firstly gave pre-test to the students. After doing pre-test, then the writer gave treatments by applying the cooperative learning type picture and picture in experimental class and using scientific approach in control class. At the last, the writer gave post-test in order to observe the use of cooperative learning type picture and picture in experimental class and the use of scientific approach in control class in teaching writing recount text.

The experiment was designed as follows:

|    |                |                |                |
|----|----------------|----------------|----------------|
| EG | O <sub>1</sub> | X <sub>E</sub> | O <sub>2</sub> |
| CG | O <sub>1</sub> | X <sub>C</sub> | O <sub>2</sub> |

Sugiono (2008) in Asriani (2015: 37)

EG : Experimental group

CG : Control group

O<sub>1</sub> : Pre-test

O<sub>2</sub> : Post-test

X<sub>E</sub> : The treatment of experiment group by using cooperative learning (Picture and Picture) in teaching writing recount text.

X<sub>C</sub> : The treatment of control group by using scientific approach in teaching writing recount text.

## B. Research Method

The writer applied quantitative as the method of this research. Brannen (2005) states that quantitative research method shows the implementation of the numeric approach towards data collection and analysis. According to Kaswan & Suprijadi (2016) a quantitative research method is a deductive theory-based research process that focuses primarily on testing theories and specific research hypotheses that consider finding differences and relationship

using numeric data and statistical method to make specific conclusion about the phenomena. Meanwhile, Creswell (2002) noted that quantitative research is the process of collecting, analyzing, interpreting, and writing the results of a study. The conclusion of the descriptions above is that quantitative research method contains the method and instrument involves numerical measurement and then the statistical quantification will be conducted.

### **C. Population and Sample**

#### **1. Population**

According to Creswell (2012: 142) “population is a group of individuals who have the same characteristic.” The small group that was observed by the writer was called a sample and the larger group about which generalization was made, we called a population. A population also is defined as all members of any well-defined class of people, events or object (Ary, et al. 2010: 148). This is line with Fraenkel, et al (2012: 92) population is usually a group of the person such as students, teachers, or other individuals who possess certain characteristics and in some cases. It can be defined as a group of classroom, schools, or even facilities. The population of this research is all students of the tenth grade students at MAN CIMAHI. The quantities of the students in tenth grade are 200 students.

## **2. Sample**

According to Creswell (2012: 142) “sample is a subgroup of the target population that the researcher plans to study for generalizing about the target population”.

In this research, the writer took two classes from six classes as the sample; they are 30 students in X IIK as an experimental class and 30 students in X MIA-2 as a control class. A technique of sampling is purposive sampling. Purposive sampling is choosing the sampling based on the certain purposes to support the research (Sukardi, 2003).

## **D. Instruments**

According to Tavakoli (2012: 277) “instrument is any device which is used to collect the data. Instruments can be presented in written, audio, or visual format.” In other words, research instrument is a device which is used to collect the data and make the research easy to process. The data collection is the accumulations of specific evidence that will enable the researcher to properly analyze the results of all activities by his research design and procedures. The main purpose of data collection is to verify the research hypotheses (Singh, 2006: 212).

To determine the result of this research, the writer had to do some processes to find out the result. The data of this research was a written test. There were some tests conducted by the writer such as pre-test and post-test.

## 1. Tests

According to Peter, et al (2008: 9) test is a formal, systematic procedure used to gather information about students' achievement or other cognitive skill. In this research, the tests used to get information about students' writing skill improvement. The writer conducted pre-test and post-test to measure that improvement. Before the writer gave the tests for the students, the writer tested the tests such as validity and reliability. According to Harris (1969: 13) in Ilma (2013: 49) stated that all good tests processed two qualities: validity and reliability. That was to say, any tests that used has to be appropriate in terms of our objectives, dependable in the evidence it, and applicable to our particular situation.

### a. Validity Test

Validity refers to the precise measurements of the test. Validity is defined as the extent to which the instrument measures what it supposes to measure. It means that a valid test of the subject would measure the subject itself. For instance, the valid of reading test would measure reading.

In this case, some people tested the validity test with seeing the Item-Total Statistics. Each of the items of validity scores or results can be seen at Corrected Item-Total Correlation. Interpretation: if the scores in Corrected Item-Total Correlation are equal or higher than the validity index (0.3), the scores or items are valid (Pallant, 2011:100 in Sadikin, et al, 2019).

The validity test of experimental class and control class were given by the 3 inter-raters after the students received the pretest in order to know the scores were valid or not. The results score of validity which the scores of each aspect in writing assessment: content, organization, vocabulary, language use, and mechanics took from the result of the pretest of experimental class and control class with a quantity of 30 students of each class. Then, the scores also were given by each inter-rater who calculated the scores of each aspect. (See Appendix 11 & 12). The results of validity test were presented as follow:

### 1. Experimental Class

**Table 3.1 Validity Test of Experimental Class**

| Item-Total Statistics |                               |                                   |                                      |                                     |
|-----------------------|-------------------------------|-----------------------------------|--------------------------------------|-------------------------------------|
|                       | Scale Mean if<br>Item Deleted | Scale Variance<br>if Item Deleted | Corrected Item-<br>Total Correlation | Cronbach's Alpha<br>if Item Deleted |
| CONTENT               | 6.36                          | 1.425                             | .591                                 | .687                                |
| ORGANIZATION          | 6.57                          | 1.036                             | .584                                 | .650                                |
| VOCABULARY            | 6.82                          | 1.232                             | .398                                 | .729                                |
| LANGUAGE USE          | 6.79                          | 1.161                             | .475                                 | .697                                |
| MECHANICS             | 6.84                          | 1.255                             | .560                                 | .667                                |

The table 4.3 above described that the scores of experimental class were given by inter-rater 1, inter-rater 2, and inter-rater 3 in the Corrected Item-Total Correlation of the table of Item-Total Statistics was bigger than validity index 0.3, it can be concluded that the items were valid.

## 2. Control Class

**Table 3.2 Validity Test of Control Class**

| Item-Total Statistics |                               |                                   |                                      |                                     |
|-----------------------|-------------------------------|-----------------------------------|--------------------------------------|-------------------------------------|
|                       | Scale Mean if<br>Item Deleted | Scale Variance<br>if Item Deleted | Corrected Item-<br>Total Correlation | Cronbach's Alpha<br>if Item Deleted |
| CONTENT               | 6.43                          | 1.243                             | .688                                 | .837                                |
| ORGANIZATION          | 6.47                          | 1.346                             | .614                                 | .854                                |
| VOCABULARY            | 6.74                          | 1.254                             | .707                                 | .831                                |
| LANGUAGE USE          | 6.81                          | 1.316                             | .756                                 | .820                                |
| MECHANICS             | 6.79                          | 1.406                             | .689                                 | .838                                |

The table 3.2 above describes that the scores of control class were given by inter-rater 1, inter-rater 2, and inter-rater 3 in the Corrected Item-Total Correlation of the table of Item-Total Statistics were bigger than validity index 0.3. It can be concluded that the items were valid.

### b. Reliability Test

Reliability is the consistency of the measurement or the degree to which an instrument measures the same way each time it is used under the same condition with the same subjects. In short, it is the repeatability of your measurement. Phelan & Wren (2005) stated that reliability is the degree to which an assessment tool produces stable and consistent result. Meanwhile, Hughes (2003: 50) adds that to be valid a test must provide consistently accurate measurement. It must be reliable.

To measure the reliability of tests, the writer tested the test with inter-rater reliability, where several assessors, observers or judges are asked to assess the students' essays. To gain the trust in the assessor, we need inter-rater reliability because the final score of the students is a composite or the average of the assessors, reliability depends on the number of assessors (Howitt & Cramer, 2011).

To know that the scores in inter-rater reliability are high, the first steps should be considered was seeing on the scores of significance (p-value) in Average Measures, if the scores were lower than 0.05, the scores were reliability. In other hands, see on interclass correlation from Average Measures, if the significance (p-value) was higher than 0.8 the tests have high Inter-rater reliability.

The results score of reliability test of experimental class and control class which the scores were divided by the number of inter-raters. (See Appendix 13 & 14). The results of reliability test of experimental class and control class were presented as follow:

### 1. Experimental Class

**Table 3.3 Reliability Test of Experimental Class**

| Intraclass Correlation Coefficient |                                     |                         |             |                          |     |     |      |
|------------------------------------|-------------------------------------|-------------------------|-------------|--------------------------|-----|-----|------|
|                                    | Intraclass Correlation <sup>b</sup> | 95% Confidence Interval |             | F Test with True Value 0 |     |     |      |
|                                    |                                     | Lower Bound             | Upper Bound | Value                    | df1 | df2 | Sig  |
| Single Measures                    | .670 <sup>a</sup>                   | .489                    | .812        | 7.100                    | 29  | 58  | .000 |
| Average Measures                   | .859 <sup>c</sup>                   | .742                    | .928        | 7.100                    | 29  | 58  | .000 |

Two-way mixed effects model where people effects are random and measures effects are fixed.

a. The estimator is the same, whether the interaction effect is present or not.

- b. Type C intraclass correlation coefficients using a consistency definition. The between-measure variance is excluded from the denominator variance.
- c. This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.

Based on the table 3. above, the data were reliable because the score (Sig = 0.000) from Average Measures was smaller than 0.05. Meanwhile, this instrument had the high inter-rater reliability, because interclass correlation from Average Measures (=0.859) was bigger than 0.8.

## 2. Control Class

**Table 3.4 Reliability Test of Control Class**

|                  | Intraclass Correlation Coefficient     |                         |             |                          |     |     |      |
|------------------|----------------------------------------|-------------------------|-------------|--------------------------|-----|-----|------|
|                  | Intraclass<br>Correlation <sup>b</sup> | 95% Confidence Interval |             | F Test with True Value 0 |     |     |      |
|                  |                                        | Lower Bound             | Upper Bound | Value                    | df1 | df2 | Sig  |
| Single Measures  | .615 <sup>a</sup>                      | .419                    | .776        | 5.795                    | 29  | 58  | .000 |
| Average Measures | .827 <sup>c</sup>                      | .684                    | .912        | 5.795                    | 29  | 58  | .000 |

Two-way mixed effects model where people effects are random and measures effects are fixed.

- a. The estimator is the same, whether the interaction effect is present or not.
- b. Type C intraclass correlation coefficients using a consistency definition. The between-measure variance is excluded from the denominator variance.
- c. This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.

Based on the table 3. above, the data were reliable because the score (Sig = 0.000) from Average Measures was smaller than 0.05. Meanwhile, this instrument had the high inter-rater reliability, because interclass correlation from Average Measures (=0.827) was bigger than 0.8.

**c. Pre-test**

In the first meeting, the write used pre-test to the students to know their writing skill. In the pre-test, the students answered the essay question of written text to write their holiday experience in the past. They had to make a recount text.

**d. Treatment**

In this meeting, the writer gave the treatment to the experimental class by using cooperative learning type picture and picture. The students must write and sort the picture into a good chronological story that has been sorted by the writer in a group or individually. Meanwhile, the writer gave the treatment to the control class by using scientific approach.

**e. Post-test**

After the writer gave the treatment to the students, the writer gave the post-test. The test was similar to the pre-test. The post-test were given by the writer to the students to know the improvement of students writing skill through recount text. In the post-test, the students answered the essay question of written text to write their experience in the new students' orientation in the past. They had to make a recount text.

The data was taken from the result of the tests (pre-test and post-test) that had given to the students before and after treatments. The writer adopted from Brown (2003) cited in Puspita (2014: 36)

explain that there are five elements of scoring writing skill namely: content, organization, vocabulary, language use, and mechanics. This form of the scoring can be done quickly and easily.

**Table 3.5**

**Criteria of Assessing Writing**

According to Brown (2003) cited in Puspita (2014: 36)

| <b>The Item to be Evaluated</b> | <b>Description</b> |                                                                                                                                | <b>Score</b> |
|---------------------------------|--------------------|--------------------------------------------------------------------------------------------------------------------------------|--------------|
| 1. Content                      | Excellent          | The paragraph contains complete sentences and correct use of tenses, degree of comparison and adjective.                       | 4            |
|                                 | Good               | There are mostly complete sentences, there are still several errors in tenses, degree of comparison and adjective.             | 3            |
|                                 | Average            | There are few complete sentences, there are errors often occur on tenses, degree of comparison and adjective.                  | 2            |
|                                 | Poor               | The paragraph shows that the writer does not master the grammar, degree of comparison and adjective.                           | 1            |
| 2. Organization                 | Excellent          | The major points of the text are supported by relevant orientation, events and reorientation in detail of content.             | 4            |
|                                 | Good               | The major points of the text are supported by orientation, events and reorientation but rather less relevant detail of content | 3            |
|                                 | Average            | The major points of text are supported by orientation, events and reorientation but less relevant detail of content            | 2            |
|                                 | Poor               | The major points of text are supported but unrelated orientation, events and reorientation                                     | 1            |
| 3. Vocabulary                   | Excellent          | The paragraph shows that personal pronoun, linking verb and adjective are used appropriately                                   | 4            |
|                                 | Good               | Occasional errors of words form such as                                                                                        | 3            |

|                 |           |                                                                                                                                                          |   |
|-----------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|                 |           | personal pronoun, verb and adjective.                                                                                                                    |   |
|                 | Average   | Frequent errors of words form such as personal pronoun, verb and adjective.                                                                              | 2 |
|                 | Poor      | The paragraph does not show that the writer understands the usage of words as personal pronoun, linking verb and adjective                               | 1 |
| 4. Language Use | Excellent | Effective complex constructions, few errors of agreement, word order/function and good meaning                                                           | 4 |
|                 | Good      | Effective but simple construction, minor problems in complex construction, several errors of agreement, word order/function but meaning seldom obscured. | 3 |
|                 | Average   | Major problems in simple/ complex construction, frequent errors of agreement, word order/ function, meaning obscured                                     | 2 |
|                 | Poor      | Virtually no mastery of sentence construction rules, dominated by errors, not communicative, or not enough to evaluate                                   | 1 |
| 5. Mechanics    | Excellent | Spelling, punctuation and capitalization are correct                                                                                                     | 4 |
|                 | Good      | Occasional errors of spelling, punctuation and capitalization in a paragraph                                                                             | 3 |
|                 | Average   | Frequent errors of spelling, punctuation and capitalization in a paragraph                                                                               | 2 |
|                 | Poor      | No mastery of convention, dominated by errors of spelling, punctuation and capitalization                                                                | 1 |

## 2. Observation Checklist

Observation checklist gave information about the teaching and learning process by using cooperative learning and scientific approach in the classroom, what the teacher and students did in the classroom. The observer checked some aspects in the teaching and learning process by putting a tick or checklist mark to statements in the observation sheet.

### **3. Interview Guidelines**

The interview guideline was used to guide the writer to get responses from the students on the use of cooperative learning and scientific approach in teaching students writing skill through recount text. The writer interviewed the students after implementing the actions to observe the students about the difficulties faced in writing recount text.

### **E. Data Analysis**

Data analysis means to make the raw data meaningful or to draw some results from the data after the proper treatment. The ‘hypotheses’ were tested with the help of analysis data in order to obtain some significant results (Singh, 2006: 222).

To analyze the data, the writer computed the pre-test and post-test scored to know the significances of treatment. the writer gave the students’ pre-test to find out their writing basic and students gave the treatment to evidence that their writing was better than writing basic before gave the treatment. The post-test was given to find out the students’ writing skill after treatment.

The writer used IBM SPSS Statistic version 22 for software to calculate the result of data. The calculation covers normality distribution test, non-parametric statistic test, homogeneity test and independent t-test. The procedures are as follow:

#### **1. Normality Distribution Test**

Normality test used to know whether the data from experimental class and control class was normal or not. If the data from both of the class was

normally distributed, it would be used parametric analysis (Independent sample t-test) for measuring the data. Meanwhile, if the data from both of the class was not normally distributed, it would be used nonparametric test. The statistical calculation of normality test used Kolmogorov-Smirnov test by following three steps below:

- a. Setting the level of significance ( $p$ ) at 0.05 and establishing the hypothesis as follow:

$H_0$  : the scores of the experimental and the control group was normally distributed.

$H_A$  : the scores of the experimental and control group was not normally distributed.

- b. Analyzing the normality distribution with Kolmogorov-Smirnov test.
- c. Comparing the Asymp.sig with the level of signification. If the signification ( $p$ -value)  $> \alpha$  (0.05), it means that  $H_0$  (H-null) hypothesis was accepted, the sample comes from the population that was normally distributed. If the signification ( $p$ -value)  $< \alpha$  (0.05), it means that  $H_A$  (H-Alternative) hypothesis was accepted, the sample comes from the population that was not normally distributed.

## 2. Homogeneity Test

According to Coolidge (2000) variance homogeneity test was conducted to find out whether the two groups in independent t-test are equal or approximately equal. The homogeneity of variance test used Levene test in SPSS program. The steps are described as follows:

- a. Setting the level of significance ( $p$ ) at 0.05 and establishing the hypothesis as follows:

$H_0$  : the variances of the experimental and the control group are homogenous.

$H_A$  : the variances of the experimental and control group are not homogenous.

- b. Analyzing the homogeneity of variance by using Levene test in SPSS.
- c. Comparing the Asymp.sig with the level of signification. If the signification ( $p$ -value)  $> \alpha$  (0.05), it means that  $H_0$  (H-null) hypothesis was accepted, the variance both of classes was homogeneous. If the signification ( $p$ -value)  $< \alpha$  (0.05), it means that  $H_A$  (H-Alternative) hypothesis was accepted, the variance both of classes was not homogeneous.

### 3. Independent T-Test

Independent t-test was used to see whether there is a significance difference between the experimental and control group' means. The procedures of testing the independent t-test are as follows:

- a. Setting the level of significance ( $p$ ) at 0.05 and establishing the hypothesis as follows:

$H_0$  : there is no difference between students' score of experimental and control group.

$H_A$  : there is a difference between students' score of experimental and control group.

- b. Analyzing the homogeneity of variance by using Levene test in SPSS.
- c. Comparing the Asymp.sig with the level of signification (p-value) for testing the hypothesis. If the signification (p-value)  $> \alpha$  (0.05), it means that  $H_0$  (H-null) hypothesis was accepted. In addition to that there was no significant difference between experimental class and control class. If the signification (p-value)  $< \alpha$  (0.05), it means that  $H_A$  (H-Alternative) hypothesis was accepted. In addition to that there was a significant difference between experimental class and control class.

#### **F. Research Procedures**

The following were the procedure used in this research, as follows:

1. Determining the subject of the research.
2. Consulting the research to the supervisors.
3. Providing the instruments of data collecting such as test, observation form, interview guidelines etc.
4. Asking permission to the headmaster to conduct the research at the school.
5. Asking permission to the English teacher to join her class for introducing the research.
6. Doing observation in the two classes.
7. Conducting the pre-test.
8. Conducting the treatment.
9. Conducting the post-test.
10. Interviewing the students.

11. Analyzing the result of test, observation, interview by using data display and IBM SPSS 22 for window.
12. Explaining the result of data descriptively by making conclusion drawing or verification.