CHAPTER III

RESEARCH METHOD

This chapter discusses about sources of data, research design, research setting, population and sample of research, variables and indicators of research, data collection technique, and data analysis technique.

A. Research Design

Research design plays an important role in a research because the quality of research greatly depends on the design. In this research, the researcher used the quantitative design. Nunan stated that research design of quantitative research is experiment, experiment is "designed to collect data in such a way treatment to the reliability and validity of the research".[1] It means the method and instrument involve numerical measurement and then the statistical quantification will be conducted.

This research is an experimental one. Experiment is the way to find the causal relationship between two factors which are raised in purpose to reduce any distracting factors. According to Creswell experimental researchis "seeks to determine if a specific treatment influences an outcome".[2] An experimental research involves two groups: experimental group and control group. An

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[1]E-book: David Nunan, *Research Method in Language Learning*, (Cambridge: Cambridge University Press, 1992), p.47

[2]John W Creswell, *Research design: Pendekatan kualitatif, kuantitatif, dan mixed*, (Yogyakarta: PustakaBelajar. 3rd ed.), p.19.

experimental group receives a new treatment while control group receives a usual teaching. The researcher used experimental method to identify the effectiveness of using graphic organizer to teach writing of descriptive text to students at the 10th grade of MAN 2 Semarang in the Academic Year of 2016/2017.

In this research, the researcher used experimental design to identify the effectiveness of using Graphic Organizer to teach writing of descriptive text.

Referring to this research, the experimental and control group are consisting of the 10th grade of MAN 2 Semarang in the Academic Year of 2016/2017. This research uses pre-test and post-test to measure both groups changes in the period before and after receiving a treatment.

The design of the experiment could be described as follows:[3]

Pattern:

R O_1	X	O_2
R O_3	-	O_4
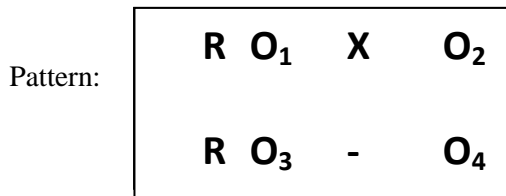
Where:

R   : Experimental and control group that are chosen randomly.

O_1 : Pre-test for experimental group

O_2 : Post-test for experimental group

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[3]Sugiyono, *Metode Penelitian Pendidikan: Pendekatan Kuantitaf Kualitatif dan R&D*, (Bandung: Alfabeta, 2009), p.112

O_3 : Pre-test for control group

O_4 : Post-test for control group

X : Treatment (Teaching giving instruction by using Graphic Organizer)

Based on the above pattern, the subjects of research are classified into an experimental group (top line) and a control group (bottom line). The quality of subjects is checked by pre-testing them (O_1 and O_3). Then, the experimental treatment (taught by using *Graphic Organizer*) is applied to the experimental group. This treatment was symbolized as "**X**". And the control group is taught without using *Graphic Organizer* or using *direct method.* The test was held in the form of written. Then, the results of post-test (O_2 and O_4) were computed statistically.

B. Subject and Setting of Research

This study was conducted with 10th grade of MAN 2 Semarang in the Academic Year of 2016/2017 which is located Jl. Banget Ayu, Genuk- Semarang as the population. The participants are 198 students from 5 classes of 10th grade student. Population is the generalization region consisting of: objects/ subjects that have certain qualities and characteristics defined by the researchers to learn and then drawn conclusions.[4] This research is an experimental research, so the researcher needs to take two classes that will be an experimental and control class as

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[4]Sugiyono, *Metode Penelitian Pendidikan: Pendekatan Kuantitaf Kualitatif dan R&D...*p.117.

the sample from five classes of the population. Sample is part of the number and characteristics possessed by the population.[5] This research used simple random sampling which is representative of 10th grade of MAN 2 Semarang in the Academic Year of 2016/2017. The researcher choose two classes as the experimental class and as the control class. X IPA2 (38) as the experimental class and X IPA5 (35) as the control class.

C. Variable and Indicators

A characteristic or quantity that increases or decreases over time, or takes different values in different situations. Sanjaya said that "a variable is any factor, condition, situation, treatment and all actions that can be used to influence the experimental".[6] According to Fred D. Kerlinger as cited by Arikunto, that all experiments have one fundamental idea behind them; to test the effect of one or more independent variables on a dependent variable (it is possible to have more than one dependent variable in experiments).[7]

This research has two variables. Those are:

a) The Independent Variable (X)

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[5]Sugiyono, *Metode Penelitian Pendidikan: Pendekatan Kuantitaf Kualitatif dan R&D*...p. 118.

[6]WinaSanjaya, *penelitian pendidikan: jenis, metode dan prosedur*, (Jakarta: Kencana, 2013), p.95.

[7]SuharsimiArikunto, *Prosedure Penelitian Suatu Pendekatan Praktik,* (Jakarta: PT. Rineka Cipta, 2010), p. 161.

Independent variable is the variable that is the cause or effect the change in the dependent variable.[8] The independent variables of this research the use of Graphic Organizer in teaching learning process.

The indicators are:

- Students answers guiding questions based on Graphic Organizers
  - *What color is it?*   *(thing)*
  - *How old your friend?*   *(person)*
  - *Where the location of your classroom?(place)*
- Students make a simple sentences based on Graphic Organizers.

b) The Dependent Variable (Y)

The dependent variable is a variable that is affected or which become due because of the independent variables.[9] The dependent variable of this research is students' writing skill in descriptive text.

The indicators are:

- Identifying the social function, generic structure and language features of descriptive text
- Using the simple present tense
- Generating the idea
- Composing descriptive text

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[8]Ahmad Tanzeh, *Pengantar metode penelitian*, (Yogyakarta: teras, 2009), p.85.
[9]Ahmad Tanzeh, *Pengantar metode penelitian...,* p. 85.

D. Data Collection Technique

   1. Documentation

Document is a piece of written or printed material that provides a record of evidence or event an agreement, ownership, identification etc.[10] It refers to the archives data that help the researcher to collect the needed data. The function of document is related to the object research such as students name list and the English subject schedule. In this case, the data will be gained by the help of the English teacher.

   2. Test

Test is a question which is used to measure competence, knowledge, intelligence and ability of talent which is possessed by individual or group to collect the data. It is measuring instrument for data collection where the questions in instrument, participants are encouraged to show maximum performance.[11] Brown states that a test is a method of measuring a person's ability, knowledge, or performance in a given domain.[12] A test is used to collect initial data and the final data about the student's ability to write descriptive text.

In this research, the researcher will use pre-test and post-test.

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[10] John Eastwood, *Concise Oxford Dictionary,* 8th Ed. (London: Oxford University Press, 2004) p. 256.

[11] Purwanto, *Evalusi Hasil Belajar*, (Yogyakarta: Pustaka Pelajar, 2013), p.63.

[12] E-book: Douglas Brown, *Language assessment Principles and* Classroom *Practices*, (San Francisco: Longman, 2004), p. 3.

1) Pre-test

Before the teacher teaches new material by using Graphic Organizer, the teacher gives the test to the students. Pre-test is given to the experimental and control class in the same way.

2) Post-test

Post-test is given to the experimental class and control class. It is given in order to know the score of students' achievement after they are taught using Graphic Organizer (experimental class) and without using Graphic Organizer or using direct method (control class).

E. **Data Analysis Technique**

1. Technique of scoring test

To measure the writing test the researcher uses the analysis method. According to J.B. Heaton analytic scoring test in writing test, there are five major items or categories. They are grammar, vocabulary, content, organization and mechanic.[13]

To analyze the students' test in writing, the researcher focus on the item in the elements of writing states by Heaton.

Table 3.1

Percentage of the Elements of Writing

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[13]E-book: J.B. Heaton, *Writing English Language Test...* p.138.

Element of Writing	Score
Content	30
Organization	20
Vocabulary	20
Grammar	25
Mechanic	5
Total of score	**100**

Explanation:

Content : The substance of writing, the ideas expressed.

Organization : The organization of the content.

Vocabulary : The choice of idioms, words, and lexical item to give a particular tone or flavor to writing.

Grammar : The employing grammatical and syntactic forms.

Mechanic : The use of graphic convention of the language.

The researcher employs scoring guidance criteria by Arthur Hughes.

Table 3.2

Scoring Guidance and the Explanation of Criterion[14]

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[14]Arthur Hughes, *Testing for Language Teachers*, (New York: Cambridge University Press, 2003), p.104

Categories	Score	Criteria
Content	**30-27**	**Excellent to very good:** knowledgeable, substantive, thorough development of thesis, relevant to assigned topic.
	26-22	**Good to average:** some knowledge of subject, adequate range, limited development of thesis, mostly relevant to topic, but lacks detail.
	21-17	**Fair to poor**: limited knowledge of subject, little substance, inadequate development of topic.
	16-13	**Very poor:** does not showing knowledge of subject, non-substantive, not pertinent.
Organization	**20-18**	**Excellent to very good:** fluent expression, ideas clearly stated/ supported, succinct, well-organized, logical sequencing, cohesive.
	17-14	**Good to average:** somewhat choppy, loosely organized but main ideas stand out, limited support, logical but incomplete sequencing.
	13-10	**Fair to poor**: non-fluent, ideas confused or disconnected, lacks logical sequencing and development
	9-7	**Very poor**: does not communicate, no organization.
Vocabulary	**20-18**	**Excellent to very good:** sophisticated range, effective word/idiom choice and usage, word from mastery, appropriate register.
	17-14	**Good to average:** adequate range, occasional errors

			of word/ idiom form, choice, usage but meaning not obscured
		13-10	**Fair to poor:** limited range, frequent errors of word/idiom form, choice, usage, meaning confused or obscured.
		9-7	**Very poor**: essentially translation, little knowledge of English vocabulary, idioms, word form.
Language use/grammar		25-22	**Excellent to very good:** effective complex construction, few errors of agreement, tense, number, word order/ function, articles, pronouns, prepositions.
		21-18	**Good to avera**ge: effective but simple constructions, minor problems in complex constructions, several errors of agreement, tense, number, word order/ function, articles, pronouns, prepositions but meaning seldom obscured.
		17-11	**Fair to poor**: major problems in simple/complex constructions, frequent errors of negation, agreement, tense, number, word order/ function, articles, pronouns, preposition and fragments, run-ons, deletions, meaning confused or obscured.
		10-5	**Very poor:** virtually nothing mastery of sentence construction rules, dominated by errors, does not communicate.

Mechanics	5	**Excellent to very good:** demonstrates mastery of conventions, few errors of spelling, punctuation, capitalization, paragraphing.
	4	**Good to average:** occasional errors of spelling, punctuation, capitalization, paragraphing, but meaning not obscured.
	3	**Fair to poor:** frequent errors of spelling, punctuation, capitalization, paragraphing; poor handwriting, meaning confused
	2	**Very poor:** no mastery of conventions; dominated by errors of spelling, punctuation, capitalization, etc. paragraphing, handwriting illegible.

2. Normality test

Normality test is used to know the distribution data normal or not. To find out the distribution data is used normality test with Chi Square.[15]

Calculate the chi square (χ^2), the formula:

$$\chi^2 = \sum_{i=1}^{k} \frac{(O_i = E_i)^2}{E_i}$$

Determine the degree of validity (df). In the calculation of this data is arranged distribution consisting of k pieces o that the interval to determine the criteria test use formula df=k-1, where k is the number of class intervals and the real extent α=0.05

Determine the distribution normality with test criteria: if $x_{count} > x_{table}$. so the data is not normal distribution and other way if $x_{count} < x_{table}$ so the data is normal distribution.

3. Homogeneity test

It is used to know whether the data are homogeneous or not.

The formula is:[16]

F=$\frac{Vb}{Vk}$

Where:

Vb: bigger variance

Vk: smaller variance

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[15]Sudjana, *MetodeStatistika,* (Bandung: Tarsiti, 2002), P.273.
[16]Sudjana, *MetodaStatistika...*, p.250

The hypotheses in homogeneity test are:

Ho: homogeneity variance $\quad = \acute{o}_1^2 = \sigma_2^2$

Ha: non homogeneity variance $\quad = \sigma_1^2 \neq \sigma_2^2$

If the calculations result of F_{count} is lower that F_{table} ($F_{count} < F_{table}$) by 5% degree of significant so Ho is accepted, it means the data is homogeneous or both of groups have the same variance.

4. Test of average

It is used to examine average whether experimental group and control group that has been decided having significant different of average.

Ho: $\mu_1 = \mu_2$

Ha: $\mu_1 \neq \mu_2$

by using the following formula:[17]

$$t = \frac{\bar{x}_1 - \bar{x}_2}{S\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} \quad \text{with} \quad s = \sqrt{\frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1 + n_2 - 2}}$$

where:

$\bar{x}_1$ $\quad$: average of experimental group

$\bar{x}_2$ $\quad$: average of control group

n_1 $\quad$: number of experimental group

n_2 $\quad$: number of control group

s_1^2 $\quad$: standard deviation of experimental group

s_2^2 $\quad$: standard deviation control group

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[17]Sudjana, "*MetodaStatistika...*", p.239

The criteria of this test is Ho is accepted if $-t_{1-\frac{1}{2}a} < t < t_{\frac{1}{2}\dot{a}}$ where $t_{\frac{1}{2}\dot{a}}$ obtained from the distribution list t with df $= (n_1 + n_2 - 2)$ and opportunities $\left(1 - \frac{1}{2}\alpha\right)$. Values for other t Ho rejected.

5. Phase End Analysis

To examine the hypothesis that have been stated, these following steps are used.

a. Normality Test

The second step of this test is same as the normality test on the initial data.

b. Homogeneity Test

The second step of this test is same as the homogeneity test on the initial data.

c. Hypothesis Test

Analysis of hypothesis test is a further analysis of the analysis preliminary. Hypothesis test is used to know whether there is a difference on post-test of experimental class and control class. The data which is used to test the hypothesis is score post-test both of class. To test the difference of average used t-test.

Ho: $\mu 1 \leq \mu 2$:   it means there is no significant difference between the writing skill improvement of students who were taught by using Graphic Organizer and

who were taught by using non-Graphic Organizer.

Ha: $\mu1 \geq \mu2$:   it means there is significant difference between the writing skill improvement of students who were taught by using Graphic Organizer and who were taught by using non-Graphic Organizer.

μ_1 = average data of experimental group

μ_2 = average data of control group

The t-test formula is used:

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

Where:

$\bar{x}_1$: average of experimental group

$\bar{x}_2$: average of control group

n_1 : average of experimental group

n_2 : number of control group

s_2^1 : standard deviation of experimental group

s_2^2 : standard deviation of control group

Testing criteria that apply Ho is accepted if $t_{count} > t_{table}$ with Determine the degree of validity df= $(n_1 + n_2 - 2)$ and the significant $\alpha = 5\% (1 - \alpha)$.