

CHAPTER III

RESEARCH METHODOLOGY

This chapter, the researcher discusses about the methodology of the study, which consists of research design, research variable, population and sample, research instrument, criteria of the test, data collection technique, and data analysis technique. Each of them will be discussed separately in this section.

3.1 Research Design

The research design of this study is quantitative research and it belongs to the experimental research design because this study investigates the effect of GIST (Generating Interactive between Schemata and Text) strategy on reading comprehension for junior high school. In this research, the researcher should pay attention to the experimental and control variables and the result of the experiment. Here, the researcher uses a quasi-experimental research design. There are two groups which are considered in this research. They are experimental group and control group. The experimental group is exposed to give the influence of the factor under consideration, and the control group is not. Both of the groups had given pre-test. Then, the treatments were given to the experimental group only, while the control group learned as usual without any treatments. However, both of the groups were given the same materials. The design of pre-test and post-test of the experimental design is presented below:

Group	Pre-test	Treatment	Post-test
D	Y1	X	Y2
E	Y1	-	Y2

Table 3.1 Quasi-Experiment Design

Where:

E : the experimental group which is given treatment

C : the control group which is not given treatment

Y1 : the pre-test before the experimental treatment

X : the treatment

Y2 : the post-test after the experimental treatment

Here, the procedures of the research design as follows:

1. The subjects are given pre-test to measure the students' reading comprehension before giving the treatments.
2. The subjects are given the treatment that is teaching reading comprehension by using GIST (Generating Interaction between Schemata and Text) strategy.
3. The subjects are given post-test to measure the students' reading comprehension achievement after the treatment is given to the subject.
4. The mean different between the results of pre-test and post-test will be found by the researcher
5. The data of t-test formula will be analyzed to prove the hypothesis
6. H_0 is received if $t \text{ statistic} > t \text{ table}$
7. H_0 is failed if $t \text{ statistic} < t \text{ table}$

From the table 3.1 above, it can be concluded that the researcher divided two groups including experimental group and a control group. Pre-test was given to two groups at the beginning of the research. Then, the treatment was given to the experimental group by GIST strategy for four meetings. Meanwhile, the

control group is given a lecturing technique for four meetings. Afterwards, post-test is given to both of groups.

3.2 Research Variable

Based on Ary (1985) a variable is an attribute that is regarded as reflecting several concepts or construct. Since this is an experimental research, there are two variables used; independent variable and dependent variable. Those two variables correlate each other. The two variables are described below:

1. The independent variable is a variable that is selected, manipulated, and measured for investigation. In this study, GIST (Generating Interaction between Schemata and Text) strategy is the independent variable.
2. The dependent variable is a variable that is observed and measured in order to determine the effect of the independent variable. The students' narrative reading comprehension ability is the dependent variable.

3.3 Population and Sample

The population of the study is a group of people which share the same of characteristic. According to McMillan (1992) population is the group to which the research result would be generalized and it includes all individuals with certain specified characteristics. Ary (1985) states that the small group that is observed is called sample and the larger group about the generalization is made is called population. In this study, the population of the study is the first semester students of the eighth grade at MTS NU Trate Gresik in the academic year of 2016/2017. The total numbers of population are 220 students. They are divided into five class; VIII A, VIII B, VIII C, VIII D, and VIII E. The researcher chose MTS NU Trate

Gresik because this school had never used GIST strategy properly before. That was known by the researcher interview with English teacher in MTS NU Trate Gresik.

While determining sample of this research, the researcher uses cluster sampling technique, it is the way to collect samples by random of the group or class. In this study, the researcher takes two classes as the sample based on the students' ability in reading comprehension. Then, the researcher divided the students into two groups includes the experimental and the control group. The experimental group was VIID class while the control group was VIIE class. The experimental group was the class consisting 40 students while the control group consists of 40 students, so the total is 80 students. The researcher took VIII D class and VIII E class because the students have the equal characteristics in English reading comprehension as shown by the result of homogeneity.

3.4 Data Collection Technique

Data collection is the process of gathering and measuring information and the data which taken from sample. The researcher had prepared pre-test. Before administering the pre-test, the researcher tried out the test to find out the validity and reliability of those items whether it is suitable for the eighth grade students or not. After found out the validity and reliability, the researcher conducted her research. For the first the researcher gave pre-test to find out the initial different on the both groups especially experiment group. And post-test would be administered after the researcher conducts the treatment and gave some exercise the experimental group in a period of time. The treatment was conducted for four

times. It was to find out whether the learners make progress in their reading comprehension or not.

3.4.1 Research Instrument

Research instrument is an important role in doing the research. In this study the researcher uses test in collecting the data. The researcher uses tests to observe and gather any information on what was going on in the class when the “Generating Interaction between Schemata and Text” arrived by the students. There are two tests that are used by the researcher, those are pre-test and post-test. Pre-test will be administered before the researcher conducts the treatment and it is to find out the initial different of the both groups. And post-test will be administered after the researcher conducts the treatment to experiment group, and gives some exercise to the both groups in a period of time. It is to find out whether the experiment group makes progress in their reading comprehension. The items of pre-test and post-test are 40 items of multiple choices. Before giving pre-test and post-test, the researcher will try out to measure the validity and reliability of the test to make sure that the test was valid.

3.4.1.1 Test

A test is given to measure a person ability or knowledge. Test is a part of the teaching and learning process. That is why a test is important in this research. Arikunto (2010:96) explains that test is a set of question, exercises or other means which are used to measure skill, knowledge, intelligence, ability, or talent of individuals or groups. Here, the researcher gave pre-test before doing an experimental research by using GIST (Generating Interaction between Schemata

and Text) strategy and post-test was given after doing the treatment by using GIST (Generating Interaction between Schemata and Text) strategy.

The forms of the tests are multiple choices. It was chosen because it is used to measure the students reading comprehension with consideration that it can grade the students' score easily and quickly. According to Alderson (2000) multiples choices might suggest that some method are particularly suitable for the testing of reading, the subjective test can be scored more rapidly and more reliably than either of the other types. There are 40 items on reading comprehension test. The tests are tested in pre-test and post-test, the text of test is adapted with syllabus of first semester: is narrative text include 1.) Identify the generic structure and language features of the text, 2.) Identify the main idea of the text, 3.) Find the explicit information of the text, 4.) Find the implicit information of the text, 5.) Find the meaning of certain word from the text.

3.4.1.2 Pre-test

Pre-test is used to know the previous ability of the students before the treatment is giving to them. Before doing the treatment, the researcher applied pre-test that consist of 20 items in the form of multiple choice. The researcher gives 20 items in pre-test to make it easier to score the test and the item must be appropriate with time allocation. The questions of the test are related to their English material in one semester.

After finishing the test, the students submitted their work. Then, the researcher evaluated the students' task. Pre-test conducted to two classes as the

sample separately. Afterwards, the researcher divided into two groups including the experimental and control group.

3.4.1.3 Post-test

Post-test is used to measure the students' progress after giving the treatment to the experimental groups whereas the control group is taught traditionally without giving the treatment. Afterwards, the procedure of post-test has the same procedure of pre-test.

Post-test is used to find out whether or not the students make progress in their Reading Comprehension ability. The post-test administered in the last of program after giving the treatment. The test consists of 20 items of multiple choices. The items and topic of post test are same with the items and topic given to the both groups in pre-test.

3.4.2 The Validity of the Test

Validity test in this research focused on result of reading comprehension test. Validity is the most important in developing and evaluating of measuring instruments. Before conducting pre-test and post-test as instrument of this study, the test should be tried out in terms of validity and reliability. The test can be called a valid test if it measure internal knowledge or measure what should be measured. Every test whether it is a short, informal classroom test, or public examination, should be as valid as the constructor make it. There are three kinds of validity; content validity, criterion-related validity, and construct validity. In this study, the test is analyzed by using content validity and construct validity.

To decide the content validity, the researcher asked the English teacher to check the instrument validity and also based on scores criteria. The score of multiple choices, there are 20 items and every correct answer could 5 point, totally 100 point. The instrument of this study was measured by using Cronbach's Alpha to test the validity for each item To decide the construct validity, the researcher used the assistance of SPSS version 16.0 to compute descriptive statistics the instrument validity was examined by analyzing item was good or not:

The researcher used in testing the validity in:

$$r_{xy} = \frac{N(\sum Xy) - (\sum X)(\sum Y)}{\sqrt{\{N\sum X^2 - (\sum X)^2\}(\sum Y^2 - (\sum Y)^2)}}$$

Where:

r_{xy} : the coefficient of correlation X and Y variable or validity of each item.

N : the number of students/subject participating in the test

X : the sum of X scores

Y : the sum of Y scores

$\sum Y$: the sum of total score for each student.

$\sum X$: the sum of total score in each item.

$\sum XY$: the sum of multiple score from each student with the total score in each item

$\sum X^2$: the sum of the square score in each item and,

$\sum Y^2$: the sum of square total score from each student

After finding the value of r_{xy} , we can determine the validity of the test by looking at George, D. & Mallery, P. (2003) criteria :

0.80 – 1.00 : Very high validity

0.60 – 0.79 : High validity

0.40 – 0.59	: Intermediate validity
0.20 – 0.39	: Low validity
0.00 – 0.19	: Very low validity
< 0.00	: Invalid

For knowing the test is valid or not, we must compare it with r-table on $DF = N - 2$ and probability 0.05. In this study, total of students in each classes are 40 students. So, r table the value of DF which totally consisted of 40 students $((40) - 2 = 38)$. R table on DF 38 Probability 0.05 is 0.3120.

If validity of each items is higher than 0.3120, the test item is valid, but if validity of each items is less than 0.3120, the test item is not valid. For brief table of r-table, it was added in Appendix 9.

For the researcher distributed 30 items for tryout pre-test and 30 items for tryout post-test. After calculating the results of the try out using SPSS 16.00, the researcher found that there were 22 valid items and 8 invalid items in pre-test. Then, for the post test there were 21 valid items and 9 invalid. Because of the items for pre-test and post-test was different. So, both of pre-test and post-test consist of 20 items.

These are the result of construct validity for pre-test and post-test:

ITEM	TOTAL SCORE	ITEM	TOTAL SCORE
1	0.460	16	0.432
2	0.321	17	0.450
3	0.405	18	0.400
4	0.379	19	0.405
5	0.564	20	0.339
6	0.459	21	0.248

7	0.479	22	0.420
8	0.472	23	0.384
9	0.339	24	-0.232
10	0.179	25	0.398
11	0.420	26	0.516
12	0.367	27	-0.260
13	0.410	28	-0.393
14	-0.272	29	0.188
15	0.367	30	0.268

Table 3.2 Try Out Pre-Test Construct Validity

ITEM	TOTAL SCORE	ITEM	TOTAL SCORE
1	0.476	16	0.101
2	0.500	17	0.390
3	0.004	18	-0.098
4	0.404	19	0.519
5	0.427	20	0.263
6	0.319	21	0.461
7	0.447	22	0.433
8	0.356	23	0.407
9	0.332	24	0.414
10	0.450	25	0.283
11	0.212	26	0.355
12	0.519	27	-0.112
13	0.477	28	0.083

14	0.476	29	0.467
15	0.476	30	-0.245

Table 3.3 Try Out Post-Test Construct Validity

From those tables above, there are 2 kinds of tables. Pre-test and post-test, the researcher calculated validity of 30 items. For brief result of pre-test and post-test validity in SPSS 16.00, it is shown in Appendix 9 & 10.

3.4.3 The Reliability of the Test

Heaton (1988) stated that a test must be reliable as a measuring instrument, so that reliability is a necessary characteristic of any good tests. Reliability of the test refers to the degree to which a test is consistent and stable in measuring what is expected to measure. In other word, a test is reliable if it is consistent within itself and across time. The reliability of the test is characteristically presented by means of reliability coefficient or the standard error of measurement. The instrument of this study was measured by using Cronbach's Alpha to test the reliability for each item. To find the reliability the test, the researcher used SPSS 16.0 with formula

$$r_{kk} = \frac{K.Sx^2 - \tilde{x}(k - \tilde{x})}{Sx^2(k-1)}$$

$$\text{Where: } S = \frac{\sqrt{\sum F_x}}{n-1}$$

$$x = X - \tilde{x}$$

Where:

K: total item which are accepted,
 n: numbers of students who follow the test,
 x: total of correct answer,
 F : total of students who got the particular score in X.

After knowing Cronbach's Alpha coefficient, we must consider in this

George, D. & Mallery, P. (2003) :

<0.20 : Very Low Reliability
 0.20 – 0.39 : Low Reliability
 0.40 – 0.59 : Intermediate Reliability
 0.60 – 0.79 : High Reliability
 0.80 – 1.00 : Very High Reliability

If Cronbach's Alpha value $>$ r-table, the test items are reliable but if
 Cronbach Alpha Value $<$ r-table, the test items are not reliable.

Based on the result of try out for pre-test and post-test, the researcher found that both of pre-test and post-test were reliable. It was showed from the result of test items' reliability in SPSS 16.00. The reliability of 30 items in pre-test was high reliability because Cronbach's Alfa Value was higher than r-table that was 0.785. Then, reliability of 30 items in post-test was very high reliability because Cronbach's Alfa value was higher than r-table that was 0.804.

These are table of reliability for pre-test and post-test:

Reliability Statistics

Cronbach's Alpha	N of Items
.785	30

Table 3.4 Pre-test Reliability

Reliability Statistics

Cronbach's Alpha	N of Items
.804	30

Table 3.5 Post-test Reliability

In reliability analysis, the researcher only showed 2 kinds of tables. In reliability the researcher only checked the items which have been valid. So, there is no second phase in this reliability analysis.

3.4.4 Procedure

Before conducting the test, the researcher asks permission to the principal at the school and explains the purpose of the study. After getting her approval, the test is given to the students. Before conducting the test, the researcher tried out the test to find out the validity and reliability. After find out the validity and reliability, the researcher conducts the research. First the researcher gives pre-test to find out the differences between control group and experimental group. Then, the researcher gives the treatment for experimental group. It is conducted four times. The last, the researcher gives post-test after the researcher conducts the treatments and some exercises. Post-test is given to find out whether the subject makes progress in their reading comprehension or not.

3.4.4.1 Try Out

Before conducting pre-test and post-test, try out was done by the researcher to know whether the validity and reliability are good or not. Try out

was done to the other students that were not participating in this study. The researcher conducts try out to the eighth grade in other class. 30 items are for pre-test try out and 30 items are for post-test try out. Try out will be tested in VIII A class MTS NU Trate Gresik, while the pre-test and post-test will be tested in VIII D and VIII E students of MTS NU Trate Gresik after the result and analysis for try out.

3.5 Data Analysis

The next step after getting the data is data analysis. Data analysis method is very important in a research. Data analysis is a requirement to analyze the data in order to interpret the data obtained from the field. It is carrying out in order to answer the research problems with the data obtained through pre-test and post-test. The researcher used quantitative data analysis by using statistical method. This method is used to find out the significant different on the students' achievement before and after being taught by GIST (Generating Interaction between Schemata and Text) strategy. The researcher analyzed the data by using Independent sample t-test. The researcher used SPSS version 16 to compute descriptive statistics, descriptive statistics are conducted in order to find the effect of the treatment whether there is significant or not by using GIST (Generating Interaction between Schemata and Text) strategy.

Arikunto (2010:278) classified the data analysis method into three parts are: preparation, tabulation and making conclusion. The data analysis method used in this research is t-test. T-test is used to analyze the data and to compare the mean difference of the pre-test and post-test. T-test is used to find out the

difference of those score between experimental and control group if they are significant difference or not.

3.5.1 Normality Distribution Test

Normality tests is used to determine whether a data set is well-modeled by a normal distribution or not, or to compute how likely an underlying random variable is to be normally distributed. Normality test is intended to show that the sample data come from a normally distributed population. To know the normality, the researcher uses *kolmogorov-smirnov test* with SPSS. If the results are significant, then the null hypothesis of no difference between the observed data distribution and a normal distribution is rejected. If the value is more than the level of significance (0,05) the null hypothesis is accepted; the score are normally distributed.

The result of normality distribution test is as follow:

One-Sample Kolmogorov-Smirnov Test				Control	Experiment
N				40	40
Normal Parameters ^a	Mean			49.7500	45.8750
	Std. Deviation			8.31665	7.67008
Most Extreme Differences	Absolute			.129	.158
	Positive			.129	.120
	Negative			-.116	-.158
Kolmogorov-Smirnov Z				.819	.999
Asymp. Sig. (2-tailed)				.514	.271
Monte Carlo Sig. (2-tailed)	Sig.			.477 ^c	.247 ^c
	99% Confidence Interval	Lower Bound		.464	.236
		Upper Bound		.490	.258
a. Test distribution is Normal.					

c. Based on 10000 sampled tables with starting seed 2000000.

The result of calculating the normal distribution showed that the probability of the experimental group was 0.247 and the control group was 0.477. It means the result is higher than the level of significance 0.05 ($p > 0.05$) These results showed that the scores of the experimental and the control group were normally distributed.

3.5.2 Homogeneity Test

For homogeneity test, the researcher uses Levene's *test of homogeneity in SPSS 16.0 version*. The test of Levine's test, or P , defines as follow:

$$P = \frac{(N - k) \sum_{i=1}^k N_i (Z_i - Z_{...})^2}{(k - 1) \sum_{i=1}^k \sum_{j=1}^{N_i} (Z_{ij} - Z_i)^2}$$

Where:

P : is the result of the test,

K : is the number of different groups to which the samples belong,

N : is the total number of samples,

N_i : is the number of samples in the i^{th} group,

Y_{ij} : is the value of the j^{th} sample from the i^{th} group,

$$Z_{ij} = \begin{cases} |Y_{ij} - \bar{Y}_i|, \bar{Y}_i \text{ is a mean of } i\text{th group} \\ |Y_{ij} - \tilde{Y}_i|, \tilde{Y}_i \text{ is median of } i\text{th group} \end{cases}$$

The significance of P is tested against $F(\alpha, k - 1, N - k)$ where F is a quintile of the F test distribution, with $k - 1$ and $N - k$ it is degrees of freedom, and α is the chosen level of significance (0.05).

To analyze the homogeneity, the researcher uses SPSS (Statistical product and service solutions) version 16.00. The homogeneity assumption is checked in SPSS by Levene's test with the following procedures. The first procedure is inserting the pre-test data both experimental and control groups using the data view. The second procedures is going to the analyze menu, selecting compare means, and the choosing independents sample t-test. The last procedure is interpreting the homogeneity test output, the researcher needs to see Lavene's test Column to know whether the equality of variances in the groups of scores were homogeny or not.

After the researcher get the data from experimental group and control group pre-test. In the output, the average score of the experimental group with group 2 was 45.87 and the average score of control group with group 1 was 49.75.

The result of Homogeneity Test is as follow:

Group Statistics

Group	N	Mean	Std. Deviation	Std. Error Mean
Score 1	40	49.7500	8.31665	1.31498
2	40	45.8750	7.67008	1.21275

Table 3.7 Group Statistic

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Score	Equal variances assumed	.293	.590	2.166	78	.033	3.87500	1.78883	.31371	7.43629
	Equal variances not assumed			2.166	77.495	.033	3.87500	1.78883	.31334	7.43666

Table 3.8 Independent sample T-test (pre-test)

The result showed that the score of the experimental group and control group were homogeneous. In Levene's test table (see appendix 11), the result of the variance homogeneity test showed that sig. was 0.590. Because the sig was higher than the level of significance (0,005) or ($0.590 > 0,05$), it means there was no difference variance between the experimental group and control group. It showed that both of two group variances were homogenous or equal.

3.5.3 Hypothesis Testing

The researcher used independent t-test for hypothesis testing. Independent t-test was used to find out the significant differences between experimental and control groups. The steps of t-test calculation as follows: The first step is stating the hypothesis and setting the alpha level at 0.05 (two tailed test). The hypothesis uses is a null hypothesis that said, “There is no significant difference on the effect of GIST (Generating Interaction between Schemata and Text) strategy to teach reading narrative comprehension between Experimental and control group.

The formula of Hypothesis:

H1 (null hypothesis) is $\mu_1 - \mu_2 = 0$ ($\mu_1 = \mu_2$)

Alternatives hypothesis $\mu_1 - \mu_2 \neq 0$ ($\mu_1 \neq \mu_2$)

H1 : Reading comprehension using GIST (Generating Interaction between Schemata and Text) strategy

H2 : Reading comprehension without using Generating Interaction between Schemata and Text (GIST) strategy

Hypothesis testing in this research was:

H0 : There is no significant effect of GIST (Generating Interaction between Schemata and Text) strategy to teach reading narrative comprehension between experimental and control group.

H1 : There is a significant effect of GIST (Generating Interaction between Schemata and Text) strategy to teach reading narrative comprehension between experimental and control group.

The second step, the researcher uses independent t-test formula to find t-value and comparing the probability with the level of significance for testing the hypothesis. Determining t-critical in table t-(0.05) df, the researcher compares t-observed and t-critical. If $t_{obs} < t_{critical}$, the researcher should accept the null hypothesis and if $t_{obs} > t_{critical}$, it means the researcher can reject the null hypothesis. The researcher can accept the alternative hypothesis.

T-test is calculated to find out the comparison of two means between experimental and control group pre-test and post-test. To analyze the data, the researcher uses independent t-test formula. The formula used in calculating t-test is:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{S_{\bar{x}_1 - \bar{x}_2}}$$

Where:

$$S_{\bar{x}_1 - \bar{x}_2} = \sqrt{\frac{S^2_{pooled}}{n_1} + \frac{S^2_{pooled}}{n_2}}$$

Pooled variance: the average of the two sample variances, allowing the larger sample to weight more heavily.

Formula:

$$S^2_{pooled} = \frac{(df_1)s^2_1 + (df_2)s^2_2}{df_1 + df_2} \quad \text{OR} \quad S^2_{pooled} = \frac{SS_1 + SS_2}{df_1 + df_2}$$

$df_1 = df$ for 1st sample; $n_1 - 1$

$df_2 = df$ for 2nd sample; $n_2 - 1$

Estimated Standard Error of the Difference

$$S_{\bar{x}_1 - \bar{x}_2} = \sqrt{\left(\frac{SS_1 + SS_2}{n_1 + n_2 - 2}\right)\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}$$

Clearly, the results of the tests are subjected to the following statistical procedures. To calculate t-test, the researcher uses SPSS version 16.00. The post test score of experimental and control groups are analyzed by using SPSS version 16.00 with the following procedures. The first procedure is inserting the post test data of both experimental and control groups using the data view. The second procedure is going to the analyze Menu, selecting compare means, and then choosing independent sample t-test. The last procedure is interpreting t-test output; automatically it can answer to the research questions about the comparison between two groups.