

CHAPTER III

This chapter presents a description of the research method which is employed in this study. This includes research design, population and sample, instrument, procedure of collecting data and technique of data analysis.

3.1 Research Design

In this study, the researcher would like to use quasi experiment design. It is according to the aim of the study that is used to investigate the effectiveness of self-directed learning strategy for visual learner in reading comprehension. Also, quasi experiment design is deemed toward the study regarding the subject which has been classified into classes and also the schedule and material cannot be interrupted for both control and experiment group. Based on Ary et,al (2010), quasi experimental carries out different subject which cant be randomly assigned to treatment group related to type of school situation and class organization that cannot be disrupted to have full control related to accommodating a research study.

There will be two groups in this study, those are experiment group which will be taught using self-directed learning strategy, and control group which will be taught through regular teaching strategy which is proposed by the teacher that is round robin discussion. The teacher believes that round robin discussion will enhance students in reading comprehension by reading aloud in series of turn, thus, student will hear and comprehend as many as member in the group. In the end student will express their opinion related to the reading text which they have read which will generate students' confidence in term of sharing opinion.

The researcher in this study will provide pre-test and post-test to measure the effectiveness of strategy which is proposed by the researcher. Hence, Nonrandomized Control Group, Pretest–Posttest Design by Ary et,al (2010) was adopted in this study. It is

claimed that one of the most widely used of quasi experiment design in educational research. By the criteria that between control and experiment group must have an equivalence. To measure the similar, researcher will administer pre-test to make sure experiment and control group has the same cognitive aspect in term of reading comprehension which is gathered by the teacher while conduct the examination. In the process, the group who will get a treatment is only experiment group while control group will be given usual treatment by the teacher. In the end, both experiment and control group will have post-test to determine the effectiveness of the new program.

Group	Pre-test	Independent Variable	Post-test
E	Y ¹	X -	Y ²
C	Y ¹		Y ²

Table 3.1 Research Design

Notes :

E : Experimental group

C : Control group

Y¹ : Pre-test

X : Inquiry Based Learning

Y² : Post-test

3.2 Population and Sample

This study takes population of second grade of senior high school of MAN 1 GRESIK that consist of twelve classes for about 265 students which consist of students of science, social, language and religion class. It has been agreed that according both Mc.Milan (1992) and Ary et,al (2010) stated that, population is the number of group which has larger number than sample that is intended in the study to be generalized. The researcher selects MAN 1

Gresik because it is confirmed by English teacher that Self-directed learning strategy had never been used before to teach English subject especially in reading comprehension.

Meanwhile, this study employs 62 students of XI grade that is 33 students of MIPA-1 and 29 students of language-1 class as sample. It's stated by Ary (1985:138) the small part of people or individuals with the same characteristics is sample. The group is selected through pre-test of reading comprehension. In this case, cluster sampling technique is applied regarding the subjects who have been classified into group of class which researcher cannot choose individually. As Ary (1990), argue that cluster sampling is choosing a group already together not an individual.

3.3 Data Collection

The researcher in this study collects data from reading comprehension test which is done before the treatment of strategy for both control and experiment group (pre-test). And in the end, both of group will be tested (post-test) in order to find out the effect of strategy which has been implemented toward experiment group compared with control group which use teacher's teaching method.

3.3.1 Research Instrument

3.3.1.1 Test

In this study, the researcher utilizes test as the collecting data instrument. The test itself consists of pre-test and post-test. The test is given in order to measure students' ability in reading comprehension after and before students are implemented of treatment. Pre-test is administered before implementing the strategy in order to know students' cognitive ability. While, post-test is conducted after the treatment which also aim to see how far the effectiveness of strategy is able to generate ability of students in reading comprehension. The

content both of pre-test and post-test are taken based on the Standard of competence in the syllabus of eleventh grade (School Based Curriculum at eleventh grade of senior high school). The syllabus can be seen in the *appendix 1*.

a. Pre-test

To measure students' cognitive in reading comprehension before getting treatment, the researcher need to administer a pre-test. This test is administered toward both experiment and control group which aim to meet students' ability in reading comprehension, with level of material's difficulty during treatment especially for experiment group and also to obtain information related to the equality of students' cognitive aspect then, the similar classroom in term of ability will be taken as research sample. Regarding the research's objective is to examine students' reading comprehension. Thus, the form of the test is a set of paper based test's reading comprehension which contains of narrative text and recount text. Students have to be able to finish the test by set of the time by comprehending not only the content but also the vocabulary use in the text.

b. Post-test

The procedure and the form of post-test is the same as pre-test, that is students have to accomplish all items of reading text paper-based test in the period of time. Post-test is carried out when treatment has been done toward students. Therefore, post-test is utilized in order to see students' progress of reading comprehension during treatment in the class and determine the effectiveness of strategy by comparing with score of pre-test.

3.3.1.2 The Validity of Test

Validity is necessary conducted before administering test. It will check whether the instrument has been valid to be tested. Further, validity is not only focus on the instrument itself but on the result whether meaning and interpretation of the score which has been gathered from the instrument. As Ary et,al (2010) asserts that, validity of the test at least consist of content validity, face validity and construct validity.

To determine content validity, the researcher composes content of test which is taken from school's English curriculum and syllabus in term of material. Then, researcher considers it into material that will be tested as pre-test and post-test. *Appendix 2*

Sub Basic Competence	Topic	Question number	
		Pre-test	Post-test
3.2 Applying social function, text structure and language aspect of transactional interaction kind of text oral and written which include asking and giving information related to action and activity which happened in the past.	Teks recount	11-20	1-10
3.5 Differentiate social function and text structure and language aspect of several narrative texts by asking and giving information related to short story and its context.	Teks Narrative	1-10	11-20

Table 3.1 Content Validity

Meanwhile, face validity is an instrument to qualify of any certain ability which it's should be tested. In this case, research' objective in this study aims to measure students' in reading comprehension thus, it should contains of question which examines students' ability in obtaining main idea and infer vocabulary in the passage. According to Ary et,al (2010) face validity is tend to ensure examinees' belief that the instrument is measuring what it is supposed to measure. He asserts that even though face validity is not a technical form of validity but it is important to ensure examines' acceptance of the test and cooperation.

Whereas to determine construct validity, the researcher uses the assistance of SPSS version 16.0 programs to compute descriptive statistics. The instrument validity was examined by analyzing item has been constructed well in term of validation 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:

Rxy : 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 X 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,

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

Each item square is determined by using these following categorizations:

<0, 3 is difficult

03 - 07 is medium

0, 7 - 1 is easy

3.3.3 The Procedure of Collecting Data

The first step of collecting data, before administering the test, the researcher asked permission to the principal at the school and explained the purpose of this study. After getting the approval, the researcher met with English Teacher to discuss about the schedule of teaching. Then, the researcher prepares reading comprehension paper-based test as pre-test

that is carried out to obtain students' previous cognitive achievement which is matched from English' syllabus. The second, the researcher tried out the test to find out the validity and reliability of those items. The third is giving pre-test both of the classes before implementing self-directed learning and getting the score of the test. The fourth is the researcher giving treatment to experimental class to implementation self-directed learning. The fifth is giving post-test both experimental and control group. The last is if the all data have ready done the researcher calculates the all data to know the effectiveness of inquiry based learning toward students' critical thinking. For further teaching design and activity researcher provides four lesson plans and pre-test and post-test item which can be seen in *Appendix 3*

Schedule:

No.	Meeting	Activity	Group	Topic	Time
1.	1 st meeting	Giving pre-test	Experiment and control group	Narrative and recount text	2 x 45 minutes
2.	2 nd meeting	Giving implementation	Experiment group	Recount text	2 x 45 minutes
3.	3 rd meeting	Giving implementation	Experiment group	Recount text	2 x 45 minutes
4.	4 th meeting	Giving implementation	Experiment group	Narrative text	2 x 45 minutes
5.	5 th meeting	Giving implementation	Experiment group	Narrative text	2 x 45 minutes
6.	6 th meeting	Giving post-test	Experiment and control group	Narrative and recount text	2 x 45 minutes

3.4 Data Analysis

Regarding the data collection' result is obtained from pre-test and post-test, thus, in this study, the researcher analyzed the data by using independent sample t-test in SPSS 16.0. The researcher used independent sample t-test because the sample was small and the groups were independent. It was carried out to decide whether there was significance different between experimental group and control group.

Assumptions for the independent t-test: (1) Independence: Observations within each sample must be independent (they do not influence each other), (2) Normal distribution: The scores in each population must be normally distributed and, (3) Homogeneity of Variance: Two populations must have equal variances (the degree to which the distributions are spread out is approximately equal). The steps of analyzing the result are: The data analysis method used in this research is t-test. In this research did not use normality distribution because our data is parametric. There are two kinds of parametric data, they are ratio and interval. The data in this study include ratio. The result data in ratio is definite homogeny and normal distribution.

In order to compare the mean difference of pre-test and post-test, hence, T-test is utilized to analyze the data. In addition, the researcher wants to examine the effect of self-directed learning strategy for visual learner in reading comprehension.

By the formula as follows:

$$t = \frac{Md}{\sqrt{\frac{\sum x^2 d}{N(N-1)}}$$

Notes :

t : The Coeficient of the formula

Md : Mean of deviation (pre-test and post-test)

x^d : Deviation of each subject ($d - Md$)

$\sum x^{2d}$: the sum of squared of deviation

N : The total number of subject

Db : $N-1$ (degree of freedom)

3.4.1 Homogeneity Test of Variance

In this step, researcher utilizes One Levene's test in SPSS 16.0 which is used for homogeneity test to analysis the variances of the observation in Control Group and Experimental Group were equal. Because the researcher could not random the students so, homogeneity test was necessary to make sure the students in both of the class had the same ability in reading comprehension or not. The test of Levene's test (P) was defined as follows:

$$W = \frac{(N - k) \sum_i^k = 1 N_i (Z_{i.} - Z.)^2}{(k - 1) \sum_i^k = 1 \sum_j^{n_i} = 1 (Z_{ij.} - Z_{i.})^2}$$

Where

W 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_{ij} is the number of sample in the i^{th} group

Y^{ij} is the value of J^{th} sample from the i^{th} group

$$Z_{ij} = |Y_{ij} - \gamma_i|, \gamma_i \text{ is mean of } i - \text{th group}$$

$$Z_{ij} = |Y_{ij} - \gamma_i|, \gamma_i \text{ is median of } i - \text{th group}$$

The significance of W is tested against $F(\alpha, K-1, N-K)$ where F is a quintile of F test distribution, with $K-1$ and $N-K$ its degree of freedom, and α is the chosen level of significance (usually 0,05 or 0,01).

To analyze the homogeneity, the researcher uses SPSS (Statistical Product and Service Solutions) 16.0 program. 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 procedure is going to analyze menu, selecting compare means, and choosing independents sample t-test. The last procedure is interpreting the homogeneity test output, the researcher needs to see Levene's test Column to know whether the equality of variences in the groups of scores is homogeny or not.

3.5.2.3 Hypothesis Testing

By using independent t-test, the aim in the end of this study is to find out the significant differences of self-directed learning strategy for increasing students' visual learning style in reading comprehension between the experimental group and control group. The steps of t-Test calculation were:

1. Test the hypothesis of the research and setting the α (alpha) level at 0.05

(two tailed test). The hypothesis could be formulated as follows:

H0 : there was no significant effect on the use of self-directed learning strategy between experimental group and control group.

H1 : there was a significant effect on the use of self-directed learning strategy between experimental group and control group.

2. Finding t-value using Independent t-Test and comparing the probability with the level of significance the hypothesis. After the scores were computed in SPSS 15.0 version, then saw the output of Independent t-Test and interpreted the output that if gig (2 tailed)

$> \alpha (0.05)$, the researcher should accept the H0 but if sig (2 tailed) $< (0.05)$ so the researcher can reject H0 it means H1 is accepted.

T-test was calculated in order to find out the comparison of two means between Control Group and Experimental Group pre-test and post-test. In analyzing the data the researcher used independent t-Test formula. In calculating t-Test, the formula was as follow:

$$t = \frac{(x_1 - x_2) - (\mu_1 - \mu_2)}{S_{x_1 - x_2}}$$

Where:

- t is t value
- x_1 is average group 1
- x_2 is average group 2
- S is standard error of the two groups
- $\mu_1 - \mu_2$ is always defaults to 0

Where:

$$S_{x_1 - x_2} = \frac{\sqrt{S^2_{pooled} + S^2_{pooled}}}{n_1 + n_2}$$

- $S_{x_1 - x_2}$ is standard error of two groups
- S^2_{pooled} is variants of the two groups
- n_1 is Number of sample group 1
- n_2 is Number of sample group 2

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

Formula:

Estimated standard error of the difference

$$S_{x_1 - x_2} = \frac{\sqrt{(SS_1 + SS_2)(1 + 1)}}{(n_1 + n_2)(n_1 + n_2)}$$

Finally, following statistical procedures determine the result of the test. To calculate t-test, the researcher uses SPSS 16.0 program. The posttest of experimental and control group are analyzed by using SPSS 16.0 program with the following procedure. The first procedure is inserting post-test data of both experimental and control groups using the data view. The second procedure is going to analyze Menu, selecting compare means, then, choosing independent sample t-test. The last procedure is interpreting t-test output, automatically it could answer to the research questions about the comparison between two groups.

However, pre-test and post-test are employed to collect primary data in order to find out the significance on the effect of self-directed learning strategy on reading comprehension at eleventh grade in MAN 1 Gresik.