CHAPTER III

RESEARCH METHOD

This chapter discusses the method used by the researcher in conducting the research. The discussion include research design, population and sample, research instrument, validity and reliability testing, data collection method and data analysis.

A. Research Design

First of all, it is better to know what research is before discussing more about the topic. According to Homby (1995:996) research is careful study on investigation, especially in order to discover new fact or information such as scientific historical research. It means that a study is done carefully and accurately on investigation of an event, problem, and phenomenon about scientific to find out new information. In conducting this research needed a plan some steps he or she would take. Consequently, the design of the research should be suitable for the research condition. For these reason, a researcher had to follow the research design, if he or she wanted their research would be successful.

The design of this research is an experimental research design using quantitative approach with One–Group Pretest-Posttest. According to Ary (2002:22), quantitative research uses objective measurement and statistical analysis of numeric data to understand and explain phenomena. In quantitative research there are experimental and non-experimental research design. Experimental research involves a study of the effect of the systematic

manipulation of one variable on another variable and non-experimental research; the researcher identifies variables and may look for relationship among them, but does not manipulate the variables (Ary, 2002:24).

This study used pre-experimental design by using One Group Pretest-Posttest. This design is classified as pre experimental design because that is no control of extraneous variables. Since there was no control of extraneous variable so, the researcher used one group pre-test and post-test as the research design. This design involved only one group as its subject and it involved three steps: pretest, treatments, and post test. The group was given a pre-test before the experimental treatment. It was to know the students' reading ability before they had been taught by using SMART. After the treatment was finished, the post-test is administered to see the achievement.

Pre-experimental has two variables which consists of independent variable and dependent variable. Independent variable (X) is a condition which influences other variable. Whereas, dependent variable (Y) is a condition which is influenced by experimental. Pre-test is dependent variable before getting manipulation of the independent variable (before giving a treatment) and after getting manipulation of independent variable (after giving a treatment) is called post-test (Donald:2010). The illustration of the research design as follows:

Table 3.1 A diagram One Group Pretest-Posttest Design

Pre-test	Treatment	Post-test
Y_1	X	Y_2

Based on the table 3.1, experimental design used pre-experimental research design (*one group pretest post-test design*) that consist of pretest (Y1), treatment (X) and posttest (Y2). The researcher uses this design because pretest (Y1) is a test which is done to measure the students' ability in the first. The students are given a standardized test that appears to be a good measure the score before given treatment. After conducted pretest, researcher gave treatment (X) to the students. Eventually, at the end of the treatment, the researcher is given posttest (Y2) to measure the difference score between before and after treatment.

B. Population, Sample and Sampling

1. Population

"Population is a group of individuals who have the same characteristics (Creswell, 2008:151)". Population is the whole subject of research. A population is defined as all members of any well-defined class of people, events or objects (Ary, 2010: 148). Based on some of these opinion can conclude that the population is whole the object that have same characteristics and it becomes the source data that was used by researcher to conduct study. In this study, the population are all of the Tenth grade of MAN 1 Kota Kediri which consist of ten classes (IIK, IIB, MIPA1, MIPA 2, MIPA 3, MIPA 4, MIPA 5, IIS 1, IIS2, IIS3) They consist of 342 students.

2. Sample and Sampling

Selected of the sample is very important step in conducting a research study because of the large number of population. According to Creswell (2012: 142), sample is a subgroup of the target population that the researcher plans to study for the purpose of making generalization about the target population. In the same case, Ary (2010: 138) said "The small group that is observed is called a sample." In this research, the researcher took one class of first grade of MAN 1 Kota Kediri. That is class X IIS 1. It consists of 35 students, 9 male students and 26 female students.

Sampling is the selecting process of subjects in a group for a study in such a way that the individual represents the large group from which they were selected. Ary et al (2010:167) stated that sampling is the small group that is observed. Sampling is also as a way the researcher select number of individuals as a sample which presents the population.

In this research, the researcher chooses X IIS1 class because X IIS 1 class students are active students and it will be good to give treatment for them.

C. Research Instrument

Instrument has important function in conducting this research. Arikunto (2010:160), states that instrument is a tool or facilities that is used by researcher. so, the researcher must choose some instruments in the process of collecting data. Instrument is a tool to collect a data which is needed in the research. The instrument of this research is test. A test, in simple term, is method of measuring a

person's ability, knowledge of performance in a given domain (Brown, 2001: 384). The test used to measure the students' achievement in reading before and after they taught by using SMART Strategy. There are two kinds of test. They are pre-test and post-test. Pre-test was given before the students were taught by using SMART strategy and post-test after taught by using SMART strategy. Before administered the pre-test and post-test, the researcher made tryout to the test.

D. Validity and Reliability Testing

The important thing in the research is about measurement, there are two important characteristics that every measuring instrument should possess: validity and reliability (Ary *et al*, 2002:213).

1. Validity

The most simplistic definition of validity is that is the degree to which a test measures what is supposed to measure (Gay, 1992: 155). To measure whether the test has good validity or not, the researcher analyzed the test from content validity, face validity and construct validity.

a. Content validity

To measure students' reading ability so the test was used a reading test. It means that test is said to have content validity if it is represented the content of universe. Ary et al (2010:226) stated that to have a content validity, the instruments are representative of some defined universe or domain of content. It means that the items of the test must really test the domain that was reading skill. In this research, the test, pre test and post test were in the form of multiple choices and True False question. The students must answer the test related to Descriptive text.

Table 3.2 Content validity of pre-test

Competence	Indicator	Test item	
		Pre-Test	Post-Test
3.4 Memahami tujuan, struktur teks, dan unsur kebahasaan dari jenis teks deskriptif lisan dan tulis, sederhana, tentang orang, tempat wisata, dan bangunan bersejarah terkenal.	• Students can determine the topic of the test	1, 23	1, 23
	• Students can determine the type of the text	24	24
	• Students can determine the explicit information of the text	Multiple choice : 2, 3, 6, 7, 12, 13, 14, 16, 17, 20, 21, 25 True false question : 1,2,3,4,5	Multiple choice : 2,4,5,6, 7, 12, 13, 14, 16, 17, 20, 21, 25 True false question: 1,2,3,4,5.
	• Students can define the meaning of an unfamiliar word in the text	5,9,11,22	9,11,22
	• Students can determine the reference of words in the text	4,8,10,15	3,8,10,15
	• Students can determine the purpose of the text	18, 19	18, 19

b. face validity

A test is said to have face validity if it looks as if it measures what is supposed to measure. According to Ary (2010:228), face validity refers to which examines believe the instrument is measuring what it is supposed to measure. A test which does not have face validity may not be accepted by test-takers, teachers, employers.

In this research, the researcher designs the test to measure students' reading ability in descriptive text by consulting with the English teacher of MAN 1 Kota Kediri. the researcher ask the teacher's opinion about the test question is appropiate for students or not.

c. Construct validity

The construct validity of test is test which is capable of measuring certain specific characteristics in accordance with a theory of language behavior and learning (Heaton, 1975: 159). Construct validity is one kind of validity that is measures the ability which is supposed to measure. Based on theory above, in the test, the researcher asked the students to answer the multiple choice and True False question based on Descriptive text to measure the students' ability in reading and this fulfill the construct of reading test and therefore valid in term of construct validity.

2. Reliability

Reliability is consistent and dependable. So, we will know the test is consistent and dependable or not. Based on Ary *et al* (2002:236), reliability of measuring instrument is the degree of consistency with which it measures whatever it is measuring. This quality is essential in any kind of measurement. Reliability is necessary characteristic of any good test for it to be valid at all. A test must first reliable as a measuring instrument.

According to Riduwan (2004 : 136), the criteria of reliability instrument can be devideided into 5 classes, those are very reliable, enough reliable, rather reliable, and less reliable. The criteria can be showed as follow:

1. If the alpha cronbach score 0.00 – 0.20: less reliable
2. If the alpha cronbach score 0.21 – 0.40: rather reliable
3. If the alpha cronbach score 0.41 – 0.60: enough reliableIf
4. the alpha cronbach score 0.61 – 0.80: reliable
5. If the alpha cronbach score 0.81 – 1.00: very reliable

Table 3.3. Reliability Test

Reliability Statistics

Cronbach's Alpha	N of Items
.964	40

The table 3.2 shows that the reliability of Conbrach's Alpha is 0.964. It means that the reliability is very strong because the value is between 0,

81 – 1.00. From the evidence above, it was found that the test is very reliable. The data in appendix 6.

E. Normality and Homogeneity Testing

1. Normality test

Normality test 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. Normally test is intended to show that the sample data come from a normally distributed population.

To know the normality, the researcher used *kolmogorov-smirnove test* with SPSS. 21. *Kolmogorov-Smirnov D test* is a test of normality for large samples. If the result are significant, then the null hypothesis of no difference between the observed data distribution. A normal distribution is rejected. Simply put a value less than 0.05 indicated that the data are non-normal. The result can be seen in the table below:

Table 3.2 Normality Test

One-Sample Kolmogorov-Smirnov Test

		Y1	Y2
N		35	35
Normal Parameters[a,b]	Mean	82.11	87.14
	Std. Deviation	3.771	3.050
Most Extreme Differences	Absolute	.226	.211
	Positive	.226	.159
	Negative	-.174	-.211
Kolmogorov-Smirnov Z		1.339	1.246
Asymp. Sig. (2-tailed)		.055	.090

a. Test distribution is Normal.
b. Calculated from data.

The result of normality test, the test is normal because the sig. is more than 0.05 (0.055 > 0.05; 0,90 > 0.05)

2. Homogeneity test

Homogeneity test is intended to make sure that two or more groups of data samples come from populations that have the same variance. To know the homogeneity, the researcher used one way ANOVA with SPSS 21. The result can be seen in the table below:

ANOVA

Y1

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	32.937	3	10.979	.755	.528
Within Groups	450.606	31	14.536		
Total	483.543	34			

The test called homogeny if the significant score more than 0.050. Based on the table above, the test is homogeneity because 0.528>0.050.

F. Data Collecting Method

Data have very important role in a research, because the researcher can get the result by using data. To get the data, the research should use instruments of collecting data. Creswell (2012: 14) said, “An instrument is a tool for measuring, observing, or documenting quantitative data. It contains specific questions and response possibilities that you establish or developing advance of the study.” In this study the researcher uses test as instruments.

The technique of collecting data was clarified as follow:

a. Pre test

Pre-test was given before giving treatment in experimental research study or before teaching by using Self Monitoring Approach to Reading and Thinking (SMART) strategy. Pre-test is needed to measure students achievement in reading before being taught by using SMART strategy. The pre-test was conducted on April, 6th 2019. The form of Pre-test was multiple choice and true false question. The number of students who took the pre-test, there were 35 students.

b. Post test

Post-test was given after doing an experimental study or after given the treatment. It was conducted to measure students' achievement in reading after being taught by using SMART strategy as the treatment. The post-test was conducted on April 13th 2019. The post-test comprised also 30 items, in the form of multiple choice items and true false questions. The questions of post-test are different from pre-test.

G. DATA ANALYSIS

In this research, the researcher used statistical data analysis technique to know the difference between the students' scores before and after being taught by using SMART strategy in reading descriptive text. There are many kinds of the

formula of data analysis technique in quantitative research, i.e.: correlation product moment which is usually used to analyze the correlation between two intervals, and the other is t-test (experimental research). T test is used to test for significance. T test is used to analyze experiment data which use pretest and posttest. In the hypothesis testing, we as researcher always referred to the null hypothesis. The null hypothesis is a statistical hypothesis, because it states that there is no relationship between the variables in the population. The null hypothesis could be directly tested by statistical procedures. Based on the Ary, et. Al (2002: 109) stated hypothesis testing involved the following steps:

1. State, in operational terms, the relationship that should be observed if the research hypothesis is true.
2. State the null hypothesis.
3. Select a research method that will enable the hypothesized relationship to be observed if it is there.
4. Gather the empirical data and calculate appropriate descriptive statistics for these data.
5. Calculate inferential statistics to determine the probability that you're obtained results could have occurred by chance when the null hypothesis is true.
6. If the probability of the observed findings being due to chance is very small, one have sufficient evidence to reject the null hypothesis.

In this research, the researcher also use Paired Sample T-Test stated by SPSS 21 for windows to compute the statistical data. By using the paired t-test through SPSS program, the researcher expected that any significant differences in the one group pretest and posttest as merely the effect of the treatment. The analysis of the data would use SPSS program with the following stages:

1. The researcher opened the SPSS program.
2. Then, the researcher computed the mean of data with got into the pretest and posttest data to be analyzed through compare means with chosen paired samples t-test.
3. Thus, those data got again into paired variables columns
4. Before getting the result, the researcher would choose option to decide confidence interval percentages 95%.
5. After those processing, the researcher clicked “ok” to get the result.
6. After finishing, the researcher looked up in the degrees of freedom. The number of degrees of freedom (df) was he number of observations free to vary around a constant. The formula is

   $df = N - 1$

   Where:

   df : Degrees of freedom

   N : Number of pairs

7. The t value has to greater than the significance levels two-tailed 5%, because this showed if this research could be accepted or rejected the null hypothesis (Ho).

The criteria for accepting or rejecting the null hypothesis as follows; Ho is rejected if significant value <0.05 and Ho is not rejected if significant value >0.05