CHAPTER III

RESEARCH METHODOLOGY

A. Form of Research

In order to achieve the main objective of this research, the right strategy should be used in this research. The research design applied in this research is experimental. Cohen *et al* (2018: 391) stated that the experiment involved changing the value of one variable. is called the independent variable and observes the effect of that change on another variable which is called the dependent variable.

The type of experimental research used by researchers in this research is pre-experimental research using one group pretest and posttest design. Pre-test is a test given before experimental treatment to see if the groups are the same; the groups were then given a post-test with an alternative form of the same test, while the post-test was a test given after the experimental treatment (Lodico *et al* 2010:228).

In this study, the researcher took one class to determine students' reading comprehension. The researcher gave a pre-test before giving the treatment and after that, the researcher gave the treatment to the students to find out the effectiveness of the TTW strategy on reading comprehension. After that, the researcher gave a post-test to students to find out the results before and after being given treatment. The reason for choosing this strategy is to find out whether the strategy to be used in this study is effective or not.

Ary *et al* (2010: 303) states that: The design of one group pre-test and post-test usually involves three steps: (giving a pre-test that measures the dependent variable; (2) applying experimental treatment X to the subject, and (3) giving a post-test, again measuring the dependent variable. Furthermore, to explain how the design works the researcher adopted the experimental design by Ary et al (2010: 304), as follows:

Table 3.1

Research Design

Pre-Test	Treatment	Post-Test
Y_1	X	Y_2

Taken from Ary *et al* (2010:304)

Where :

X : Treatment (Think-Talk-Write Strategy).

Y_1 : Pre-Test.

Y_2 : Post-Test.

Y was applied in order to know the students' mean score before giving the treatment. Then, X represents the treatment. Y_2 was applied in order to measure the students' achievement after the treatment was given. A pre-experimental does not have a control group. The influence of experimental treatments can be seen by looking at the mean score between the pre-test and post-test. In this research, the researcher tries to investigate the effectiveness of TTW (think-talk-write) strategy to teaching reading comprehension to the tenth-grade students of Madrasah Aliyah Mathlaul Anwar.

B. Subject of the Research

1. Sample

Sample is the part of the population that indicated all the population stated by Lodico *et al* (2010:25), the sample is the smaller version of the population, the group to which the researcher would ultimately like to generalized or apply the result of the study. Therefore, in this research, the reseacher took one class, namely the tenth class of MIPA which consisted of 30 students to be observed by using purposive sampling.

2. Sampling

Sampling is fundamental to all the statistical techniques and statistical analysis. In this research, the reseacher took one sample to be observed by using purposive sampling. Purposive sampling is a sampling technique with certain consideration in Sugiyono (2016:85). According to Sugiyono (2016:25) the reason for using this purposive sampling technique is because it is suitable for using quantitative research, or reasearch that does not generalize. Thye researcher chose the class X 4 beacuse based on pre-observation it was difficult to understand the contents of the reading which was the aim of this research.

C. Technique and Tools of Data Collection

Data collection is an important step in research, because the main purpose of research is to obtain data. The collected data will be used as material for analysis and testing the formulated hypotheses. To get accurate data, proper data collection techniques are needed. Therefore, data collection must be carried out systematically, directed and in accordance with the research problem.

1. Technique of Data Collection

The data collection techniques and tools in the study according to Nawawi (Zuldafrial 2012:315) there are six data collection techniques as follows: direct observation techniques; Indirect observation technique; Direct communication techniques; Indirect communication techniques; measurement technique; and Documentary study techniques.

Based on the opinion above, the data collection techniques used in this study are as follows:

a. Measurement Technique

This technique is used by researchers to see and measure the ability of research subjects. Nurgiantoro (2016:7) "Measurement is a process to obtain a picture of numbers (scores) that show a person's answer in a particular field, for example the question of "how much". Meanwhile,

according to Margono (2014: 170) states that "Measurement techniques are a further data collection tool that intends to collect quantitative data. The measurement carried out in this study was the provision of tests in the form of questions to students at the end of the basic competencies to determine the success of the TTW (think-talk-write) strategy on students' reading comprehension. In this study, the results of the pre-test and post-test became the target of researchers to measure success before and before treatment.

b. Documentary Study Technique

Documentary study techniques are techniques that are carried out by studying archives, records or documents that exist on the research subject and also literature that is relevant to the research. According to Zuldafrial (2012:39) "Documentary study technique is a data collection method in which the researcher collects and studies the data or information needed through important stored documents". In line with the opinion of Widodo (2008: 54) "Documentation technique is a way of collecting data on respondents or research populations with written data (documents) that have been stored properly". Based on the explanation above, in this case the researcher will collect data related to research documents in the form of syllabus, lesson plan (RPP) and photos related to student activities in class such as when asking, come forward and raise their hand. This technique is usually done at the research site so that the required data is more complete.

2. Tools of Data Collection

Data collection instrument is a tool used to collect data. Because it is a tool the data collection instruments can be in the form of checklists, questionaires, interview guidelines, took camera use for photos or for recording image. Data collection techniques according to Suharsimi Arikunto (2013: 265) data collection instruments are tools that are selected and used by researchers in their activities to collect data so that these

activities become systematic and facilitated by them. In this study, the researcher used tests and documentations as a data collection tool.

a. **Test**

The test is a set of stimuli (stimulus) given to a person with the intention of getting answers that can be used as the basis for scoring a number. According to Mahmud (2011: 185) "Tests are a series of questions or other tools used to measure skills, knowledge, intelligence, abilities or talents possessed by individuals or groups". In line with Arikunto's opinion (2013: 150) "Tests are a series of questions. or exercises and tools used to measure the skills, abilities or talents possessed by individuals or groups". Meanwhile, according to Nurgiantoro (2016: 7) states "Tests are instruments or systematic procedures to measure a sample of behavior, for example to answer the question how well (high) performance of a person' whose answer is in the form of numbers". Based on the opinion above, it can be concluded that the test is a very important method used by teachers in the teaching and learning process in providing assessments, in addition to knowing students' abilities, the test also serves to symbolize student achievement. The results of the pretest and posttest are instruments to carry out and measurement techniques in this study. The results of the pretest and posttest were produced before and after the researchers gave treatment to see the effectiveness of TTW strategy to the tenth grade of Madrasah Aliyah Mathlaul Anwar. The form of the test in this research is a reading test in the form of an multiple choice test totaling 25 questions.

b. **Documentation**

Documentation is one of the data collection tools in the form of documents. Documentation as evidence of events occurring when researchers carry out research. According to Arikunto (2013:158) "Documentation is seeking and collecting data on matters in the form of notes, transcripts, books, newspapers, magazines, minutes, report

cards, agendas and so on" . Regarding hearing Arikunto's opinion, Ismawati (2011: 99) said "documentation is a data collection tool by investigating written objects such as books, magazines, documents, regulations, meeting minutes, diaries and so on. Documents used in research This is the Syllabus as a guide for developing learning tools starting from planning the management of learning activities and developing values, Learning Implementation Plans (RPP) as procedures and organizing learning to achieve basic competencies set out in content standards and described in the syllabus and photos of activities carried out by students. in the field, namely when students write news texts. This documentation data is in the form of visual images containing photos of student activities taking place. The photos collected will then be reported descriptively according to the existing conditions. Based on the opinion above, it can be concluded that documentation is data collection tools for student learning outcomes, which are needed in research from archives in schools, and other sources related to the problem under study.

3. **Validity and Reliability**

Before the researcher gave the students pre-test and post-test, the researcher has conducted a tryout. A tryout was conducted to examine the validity and reliability tests to the other class which is not class as a sample. Validity is the most important consideration in developing and evaluating measuring instruments (Ary et al, 2010: 225). It means that validity is the most important characteristic to consider when constructing or selecting a test or measurement technique.

In this research, the researcher used content validity. Content validity refers to whether the instrument is valid or not. The researcher conducted the try out tests on students who are not a sample to measure the validity of the test items; to measure the data researcher will use the formula of Pearson product-moment (Pearson r) below:

$$r = \frac{\sum xy - \frac{(\sum x)(\sum y)}{n}}{\sqrt{(\sum x^2 - \frac{(\sum x)^2}{n})(\sum y^2 - \frac{(\sum y)^2}{n})}}$$

Where :

R = Pearson r

$\sum x$ = the sum of score in X distribution

$\sum y$ = the sum of score in Y distribution

$\sum x^2$ = sum of the squared in X distribution

$\sum y^2$ = sum of the squared in Y distribution

$\sum xy$ = the sum of product of paired X and Y scores

N = number of paired X and Y score (subject)

Taken from Ary *et al* (2010:230)

Furthermore, the researcher also asked the lecture to act as a validator, checked the content of the test to determine whether the test is valid or not. Reliability is the index to point out so far the instrument to collect the data is reliable or not. Reliability refers to the degree to which a measuring procedure gives consistent results. Ary et al, (2010:235) defines the reliability of a measure whatever it measures. In this research of the test can calculate by using the formula introduced by Kuder Richardson (KR-20) as follow:

$$Rxx = \frac{k}{k-1}\left(\frac{s_x^2 - \sum pq}{s_x^2}\right)$$

Where :

Rxx = relibiality of the whole test

k = number of item on the test

sx^2 = variance of score on the total test (squared standart deviation)

p = proportion of correct response on a single item

q = proportion of incorrect response on the item

Taken from Ary *et al* (2010:245)

Table 3.2
Validity and Reliability

No	R Table(df-2) (30-2=28)	R-value	Validity	Cronbach's Alpha
1	0,374	0,481	Valid	0,866
2	0,374	0,554	Valid	0,866
3	0,374	0,501	Valid	0,866
4	0,374	0,445	Valid	0,866
5	0,374	0,564	Valid	0,866
6	0,374	0,669	Valid	0,866
7	0,374	0,501	Valid	0,866
8	0,374	0,617	Valid	0,866
9	0,374	0,417	Valid	0,866
10	0,374	0,482	Valid	0,866
11	0,374	0,617	Valid	0,866
12	0,374	-0,073	Not Valid	0,866
13	0,374	0,669	Valid	0,866
14	0,374	0,669	Valid	0,866
15	0,374	-0,038	Not Valid	0,866
16	0,374	0,593	Valid	0,866
17	0,374	0,551	Valid	0,866
18	0,374	0,469	Valid	0,866
19	0,374	0,669	Valid	0,866
20	0,374	0,509	Valid	0,866
21	0,374	-0,143	Not Valid	0,866
22	0,374	-0,038	Not Valid	0,866
23	0,374	0,610	Valid	0,866
24	0,374	0,441	Valid	0,866
25	0,374	0,547	Valid	0,866
26	0,374	0,417	Valid	0,866
27	0,374	-0,485	Not Valid	0,866
28	0,374	-0,163	Not Valid	0,866
29	0,374	-0,143	Not Valid	0,866
30	0,374	0,593	Valid	0,866
31	0,374	0,301	Not Valid	0,866

32	0,374	0,593	Valid	0,866
33	0,374	0,669	Valid	0,866
34	0,374	0,509	Valid	0,866
35	0,374	0,301	Not Valid	0,866
36	0,374	0,593	Valid	0,866
37	0,374	0,669	Valid	0,866
38	0,374	0,509	Valid	0,866
39	0,374	0,593	Valid	0,866
40	0,374	0,417	Valid	0,866
Jumlah Soal Valid		31		31

Where :

r value > r table = valid

r value < r table = not valid

Based on the table above the researcher concluded that test items for try out are 40 items. After the researcher calculated to found the validity of the test only 31 items valid. Because the researcher compared r table and r value, r table for this research was (30-2) 0,374 and the requirement valid if r value> r   table and r value< r table is not valid. After calculated the validity of the test the researcher calculated the reliability to saw the test are reliable or not. The

Cronbach's Alpha is 0,866, accordance with Sekaran (1992) in Priyatno (2012:123) that reliable< 0,6 is less good, 0,7 is accepted and more than 0,8 is   good. Because the result was 0,866 so the reliable is accepted. The total valid and   reliable of the test are 31 items but, the researcher only used 25 test   items   because adjust to the aspects researched.

After the researcher find the value then next step is to compare it with the standard guideline to determine the value of relibiality. The guideline of relibiality as follow :

Table 3.3
The degree of reliability

Coefficient	Relationship
>0,90	Very highly reliable

0,80-0,90	Highly reliable
0,70-0,79	Reliable
0,60-0,69	Marginally/minimally reliable
<0,60	Unacceptably low reliability

Taken from Ary *et al* (2010:506)

D. Technique of Data Analysis

This research used statistical analysis in order to find out the answer of the research questions and to test the hypotheses of the reseach procedures of data analysis were required. The numberical data were analyzed using windows-based program, Statistical Package for the Social Sciences (SPSS) statistic 20.

The technique of data analysis in this research as follows :

1. Students' Individual Score

In order to analysis the students' individual scores; the researcher used the formula below :

$$X = \frac{A}{N} \ x \ 100$$

Where :

X   = Student's score pre-test.

A   = Number of correct items.

N   = Total number of scoring item.

Taken from (Cohen *et al,* 2018 :576)

To calculate the students' individual score, from a test result, the number of studnts' correct answer is multiplied by 100 and then divided by the total number of test items (25). After finding the individual score the researcher would continue to analysis the means scores.

2. Students' Mean Scores

A mean is an average score that the students get from the test. In order to analysis the student main scores; the researcher use the formula below:

$$M = \frac{\Sigma X}{N}$$

Where :

M   = the students' mean score.

$\sum$X   = the total score of students.

N   = the total of students.

<div align="right">Taken from Blerkom (2009 :245)</div>

3. **Standard Deviation.**

Standard deviation is a measure of variability indicating the average amount that scores vary from the mean. In order to analysis the students' standard deviation; the researcher use the formula below:

$$S = \sqrt{\frac{\sum D^2 \frac{(\sum D)^2}{N}}{N-1}}$$

Where :

S   = Standard deviation.

$\sum D^2$ = Sum of square of each score.

$(\sum D^2)$ = Sum of scores squared.

N   = The Number of element in a sample.

<div align="right">Taken from Ary *et al* (2010 :177)</div>

4. **T Test**

If the result from the Kolgomorove-Smirnove test is nirmal the researcher continous to t-test for dependent sample. T-test for a dependent sample is a test use to compare sample's means before or after treatment. Ary *et al* (2010:176) said in a t-test for dependent sample "the measure to analyzed by the dependent *t* test is the mean difference between the paired scores. Pre-test and post-test score of the sam individuals are an example of paired scores". The formula for the t-test for dependent sample :

$$t = \frac{\overline{D}}{\sqrt{\frac{\sum D^2 - (\sum D)^2}{N (N-1)}}}$$

Where :

t   = t ratio.

$\overline{D}$ = average difference.

$\sum D^2$ = Different scores squared, then summed .

$(\sum D)^2$ = different scores summed, then square.

N = the number of elements in a sample.

Taken from Ary et al (2010 : 177)

The result of data computation would be the conclusion for dciding the hypothesis. To answer the first question, whether think-talk-write (TTW) startegy effective or not, the researcher would use the p-value of t-test. If the value of $(p) < \alpha$ (0,05) it means that TTW strategy is effective and H0 is rejected. If the value of $(p) > \alpha$ (0,05) its means that TTW strategy is not effective and Ha is fail to be rejected.

In simply way :

a) If p – value $< \alpha$, the Alternative Hypothesis accepted

b) If p – value $> \alpha$, the Null Hypothesis accepted

5. The Effect Size.

The second research question related to the strength of the effect of TTW strategy toward student's reading comprehension. The formula to found effect size as follow:

$$ES = \frac{\bar{X}Posttest - \bar{X}Pretest}{SDweighted}$$

Where :

ES = Effect size.

$\bar{X}$post-test = the student's mean score of post-test.

$\bar{X}$ pre-test = the student's mean score of pre-test.

Sdweighted = the average standard deviation of both test.

Taken from Creswell (2012:195)

Table 3.4

Qualification of the size effect

Effect size	Qualification
0 – 0,20	Weak effect
0,21 – 0,50	Modest effect

0,51 – 1,00	Moderate effect
1,00	Strong effect

Taken from Cohen *et al* (2007 :521)

E. Prosedure of Research

There were some procedures that researcher did while conducting this research . The procedure can be explained as bellows :

1. Administration

   At this stage the researcher firstly ask permission to Headmaster of Madrasah Aliyah Mathlaul nwar to conduct the research . After gaining the permission , the researcher select the sample from the tenth grade classes and contacting the teacher in charge of the class.

2. Pre - test

   The second stage the researcher gave pre - test where the researchers try to find out the samples real condition before implementing the treatment of TTW strategy.

3. Giving Treatment

   Next stage is implementing the treatment to the sample class by using TTW strategy . The treatment of TTW strategy was conducted three – times.

4. Post-Test

   The researcher conducted a post - test to know the result of implementing of TTW strategy toward the samples' reading comprehension

5. Analyzing the Test Result

   Last stage of the research is analyzing the data collected from both pre - test and post - test using formulas in this chapter .