CHAPTER III

RESEARCH METHOD

Research Method that consists of research design,time and place, population and sample of the study, research instruments,research instruments try out, research instruments validity, research instruments reliability, data collection procedures, and data analysis procedures.

A. Research Design

The design of this study was experimental design. Experimental design is a plan for an experiment that specifies what independent variables was applied, the number of levels of each, how subjects are assigned to groups, and the dependent variable.[1] The writer used the experimental design because the writer wanted to measure the effect of using mnemonic device in learning English vocabulary process at the second grade of MTsNMaliku.

The type of this study was quasi-experimental study. Quasi-Experimental design are similar to randomized experimental designs in that they involved manipulation of an independent variable but different in those subjects in that they involve manipulation of an independent variable but different in that subjects are not randomly assigned to treatment groups.[2] The writer used quasi experiment

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[1]DonalAry, *Introduction to Research in Education (Eight edition)*, United State: Wadsworth (engange learning), 2010, p. 641.

[2]*Ibid* p. 316.

because it was not based on random assignment of subjects to experiment and control group. The writer used quasi experiment by nonrandomized control group, pre test–post test design. There were two groups in this design; they were experiment group and control group. Pre-test was given to both groups to measure the score of students before treatment was given. Experiment group was given treatment with using mnemonic device and control group was taught without using mnemonic device notes (handout). Post-test was given to both groups to measure the score of students after treatment was given. The scheme of this design was:

Table 3.1
Design of pre-test and post-test

Group	Pre-test	Treatment	Post-test
Experiment Group	Y I	X	Y 2
Control Group	Y 1	-	Y 2

B. Time and Place

The place of study was MTsNMalikuBaru. It located at MalikuPermai Street no. 57, PulangPisau district. In this study, the writer conducted research two months to collect the data. It was begun on April 27th until 2nd June 2016.

C. Population and Sample of the Study

1. Population

A population is defined as all members of any well-defined class of people, events, or objects.[3] The population of this study was second grade students at MTsNMaliku, there were three classes and the number of students were:

Table 3.2

Population

NO	CLASSES	NUMBER OF STUDENTS
1	VIII-A	30
2	VIII-B	30
3	VIII-C	30
	Total	90

2. Sample

A sample is a portion of a population.[4] In this study, the writer took two classes to be the sample. The first A class was experiment group. This class was treatment with using mnemonic device. The second B class was control group. This class was taught with using handout. The sample of this study was VIII-A as experiment class and VIII-B as control class which each class consist of 30 students. The number of student was 60 students.In this study, the writer used

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[3]*Ibid*, p. 148

[4]*Ibid*, p. 148

cluster sampling because the unit chosen is not an individual but a group of individuals who are naturally together or grouped by the school.[5]

Table 3.3
Number of Sample

NO	Group	Class of student	Number of student
1	Experiment	VIII-A	30
2	Control	VIII-B	30
Total			60

D. Research Instruments

To get the data, the writer used test in this study.

1. Test

A test is a set of stimuli presented to an individual in order to elicit responses on the basis of which a numerical score can be assigned.[6] According to H Brown Douglas, test is method of measuring a person's ability or knowledge

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[5]*Ibid*, p. 154

[6]*Ibid*, p. 201.

in a given domain.[7] To get the data, the writer did the test; it consisted of pre test andpost test. The function of pre-test was to know pre-ability students' vocabulary before they used mnemonic device. And the function of post test was to know post-ability students' vocabulary after they used mnemonic device. The test was used to see the result of students' vocabulary. The score of the test was used to measure the effect of mnemonic device in learning English Vocabulary process at the second grade of MTsNMaliku.

The writer made test based on the material and was appropriated with syllabus that used by the school. The form of test was multiple-choices. The test item was constructed in form of multiple choices, because multiple choices was objective test. Objective test was made just as easy or as difficult as the test constructor wishes.[8] In this study, the students tested with multiple choices test these are synonym, antonym, and complete the sentence. So, the test will really measure students' vocabulary . The test was constructed in the form of multiple choices which consisted of 82 items, 41 items for pre test and 41 items for post test . 33 items test of adjectives, and 49 items test of verb as were showed in table 3.4. The writer took these two kinds of vocabulary because they were included as

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[7]H Brown Douglas, *Teaching by Principles*, p. 384.

[8]J. B. Heaton, *Writing English Language Tests*, Longman, 1975, p. 12.

two main forms of word. Two main forms of word consist of , verb, and adjectives.[9]

Table 3.4
The Content Specification of Test Items

No	Indicators	Number
2	Adjectives	33 Items
3	Verb	49 Items
Total		82 Items

2. Research Instrument Try Out

The writer gave test of try out to second grade students at MTsNMaliku. It was conducted on Wednesday, February 10th, 2016, at 08.20 – 09.40 am; in VIII-C rooms with the number of student were 30 students. To get the data of try out, the writer used some procedures as follows:

a. The writer made and prepared test of try out.

b. The writer gave test of try out to the students

c. The writer asked the students to do test of try out.

d. The writer collected the student's answer.

e. The writer calculated and gave score to the students' answer.

f. The writer analyzed the result of try out to know valid of test try out.

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[9]Norbert Schmitt, *Researching Vocabulary: A Vocabulary Research Manual*, New York: Palgrave Macmilan, 2010, p. 21.s

g. If the results were valid, it meant that the test items as the instrument of this study is suitable to be give.

3. Scoring Method

To give the score of the students' test, the writer will use the formula[10] as follow :

$$S = \frac{F}{N} \times 100$$

Where :

S   = Score

F   = Frequency of right answer

N   = Total item

For the data instrument of try out, it can be seen in appendix 9.

4.   The test construction

In this study the writer used multiple choice. They are for measuring the student vocabulary mastery. The writer was construct the test for measuring the students' master vocabulary. Each of the tests has different purpose. That is a form of questions, which to students before this given before a lesson. Test is

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[10]Depdiknas, p.12

intended to get information about students understanding about their mastery of vocabulary after the treatment given to them.

In this study the writer used multiple choice. There are many type of multiple choice, here the writer choose multiple choice by consist of sentence, definition, meaning, and picture. It is useful to distinguish between the following two major kinds of multiple choice vocabulary items

And then from the result of post-test, the writer determine whether the treatment that was be given to the students is significant or not based on the differences or mean score between pre-test and post-test. Based the explanation above, so the writer geve specification item of the tests thse are, complete sentence, picture, synonym, antonym, and by definition.

Table 3.8

Specification item of the test

No	Vocabulary mastery **29%**	Skill Reading	Specification item test	Verb	Adjective
1		Report text, narrative text	Complete sentence	35	19
2			Picture	14	3
3	**Vocabulary size 71**		Synonym	2	11
4			Antonym	3	10
5			Definition	3	-
Total				57	43

	100

Table 3.9

Specification item

No	Complete sentence		Picture		Synonym		Antonym		Definition	
	1		2		3		4		5	
	Verb	Adj	Verb	Adj	Verb	Adj	Verb	Adj	Verb	Adj
	3,4,7,8,10,29,30,35,36,45,49,51,52,60,61,94,97	28,33,39,40,41,42,50,54,57,63,65	11,12,13,14,17,18,,19,20,24,25,26,27	21,22,23	76	69,71,88,89	90	66,67,74,77,79,83,85,87,	98	-
	17	11	12	3	1	4	1	8	1	0
	28		15		5		9		1	
Total	Adjective					Verb				
	26					32				
	58									

a. **Distractor analyzes**

Analyzing the distractors (e.i., incorrect alternatives) is useful in determining the relative usefulness of the decoys in each item. Items should be modified if students consistently fail to select certain multiple choice alternatives. The alternatives are probably totally implausible and therefore of little use as decoys in multiple choice items. A discrimination index or discrimination coefficient should be obtained for each option in order to determine each distractor's usefulness (Millman& Greene, 1993). Whereas the discrimination value of the correct answer should be positive, the discrimination values for the distractors should be lower and, preferably, negative. Distractors should be carefully examined when items show large positive D values. When one or more of the distractors looks extremely plausible to the informed reader and when recognition of the correct response depends on some extremely subtle point, it is possible that examinees was be penalized for partial knowledge. Thompson and Levitov (1985) suggested computing reliability estimates for a test scores to determine an item's usefulness to the test as a whole. The authors stated, "The total test reliability is reported first and then each item is removed from the test and the reliability for the test less that item is calculated" (Thompson &Levitov, 1985, p.167). From this the test developer deletes the indicated items so that the test scores have the greatest possible reliability. It is calculated by using the formula:

$$D = \frac{I}{\frac{(N-R)}{(O-1)}} \ X\ 100\%$$

Were : D : Distractor analyzes

I : The number of students incorrect option

N: The number of students taking the test

R: The number of students correct answer

O: Option of the test item

1: Konstanta

E. Research Instrument Validity

1. Instrument Validity

Validity of a test is the extent to which the test measures what is intended to measure.[11] There were three types of validity:

a. Face Validity

Face validity is if a test item looks right to other testers, teachers, moderators, and testes.[12] Narrative Text was the learning material in the second

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[11]Norman E. Gronlund, *Measurement And Evaluation In Teaching (Fifth Edition)*, New York: Macmilan Publishing Company, 1985, p. 11.

semester at Junior High School. The writer made the type of test items suitable to the same level in the second year students at MTsNMaliku. The face validity of the test items as follow:

1. The kind of test was Vocabulary Test.
2. The form of test items was Multiple Choices.
3. The language of items used English.
4. The test items were suitable to the Junior High School

b. Content Validity

This kind of validity depends on a careful analysis of the language being tested and of the particular course objectives. The test should be so constructed as to contain a representative sample of the course, the relationship between the test items and the course objectives always being apparent.[13] In making the test, the writer tried to match each of the test items with the syllabus that used by MTsNMaliku. The writer made the test content (question) was related with material was taught to the students.

Table 3. 13

Specification of Content Validity

No	Contents	Type of test	Items

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[12]J. B. Heaton, *Writing English Language Tests*, Longman, 1975, p. 153.

[13]*Ibid*, p. 154.

1	"Narrative Text"	Multiple Choice	82

c. Construct Validity

If a test has construct validity, it is capable of measuring certain specific characteristics in accordance with a theory of language behavior and learning.[14] Type of test was vocabulary test; the form of test was multiple choices, and the test was written test.

To measure the validity of the instrument, the writer used the formulation of product moment by Pearson as follows:[15]

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

Where:

r_{xy} : Numeral of index correlation 'r' product moment

N   : Total of sample

$\sum XY$: Amount of the product between X score and Y score

$\sum X$: Amount of the x score

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[14]*Ibid*, p. 154.

[15]Riduwan, *MetodedanTeknikMenyusun Proposal Penelitian*, Bandung: Alfaberta, 2010. p. 75.

$\sum Y$: Amount of the y score

Furthermore, it was calculated using test t calculation as follow:

$$t \text{ observe} = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$$

Where:

t : The value of t observed

r : The coefficient of correlation of the result of r observed

n : Number of students

The distribution of t table at alpha 5% and degree of freedom (n-2) with the measurement of validity using these criteria:

t observed > t table = valid

t observed < t table = invalid

To know the validity level of the instrument, the result of the test was interpreted to the criteria below:[16]

0,800 - 1000   = very high validity

0,600 - 0,799   = high validity

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[16]*Ibid*, p. 76.

0,400 - 0,599   = fair validity

0,200 - 0,399   = poor validity

0,00 - 0,199   = very poor validity

From the measurement of validity of the try out that was consisted 100 items was known that there were 82 valid items (item ,2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 27, 28,31, 32, 33, 34, 35, 37, 38, 39, 40, 41, 42, 43, 44, 46, 46, 50, 52, 53, 54, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 70, 71, 72, 73, 74, 75,76, 77,78, 81, 82, 83, 84, 85, 87, 88, 89, 90, 91, 92, 93, 94, 96, and 100), and there were 18 invalid items (item 1, 19, 29, 30, 36, 45, 47, 48, 49, 51, 69, 79, 80, 86, 95, 97, 98   and 99).

d. Index difficulty

The index of difficulty (or the facility value) of an item simply shows how easy or difficulty the particular item proved in the test. The index of difficulty (F.V) is generally expressed as the fraction (or percentage) of the students who answered the item correctly. It was calculated by using the formula:[17]

$$F.V = \frac{R}{N}$$

Where:

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[17]J. B. Heaton, *Writing English Language Test,* Longman, 1975, p. 172.

F.V   : Facility Value.

R   : Represents the number of correct answer.

N   : The number of students taking the test.

The result of the test was interpreted to the criteria below:[18]

0,00 – 0,30 = Difficult

0,31 – 0,70 = Fair

0,71 – 1,00 = Easy

The result of index difficulty measurement of the try out showed that there were 2 difficult items(item 15 and 68). There were 25easy items(item 5,8,10, 16, 21, 23, 30, 36, 37, 38, 41, 51, 52, 61, 62, 66, 67, 71, 76, 81, 87, 88,92, and 92). There were 19 very easy items (item 11,12,13, 14, 18,19, 20, 22, 24,25, 26, 27, 35, 69, 73, 74, 91, 98 and 100,). There were 54 items moderate (item 1, 2, 3, 4, 6, 7, 9, 17, 28, 29, 31, 32, 33, 34, 39, 40, 42, 43, 44, 45, 46, 47, 48, 49, 50, 53, 54, 55, 56, 57, 58, 59, 60, 63, 64, 65, 70, 72, 75, 77, 78, 80, 82, 83, 84, 85, 86, 89, 90, 93, 94, 95, 96, and 97).

F.   Research Instrument Reliability

Reliability also means the consistency with which a test measures the same thing all the time. Reliability of a test refers to its consistency with which it yields the same

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[18]SuharsimiArikunto, *ProsedurPenelitianSuatuPendektanPraktek*, Jakarta: RinekaCipta, 1999, p. 210.

rank for an individual taking the test several times.[19] The reliability of the whole test can be estimated by using the formula KR 21[20]

$$r_{11} = \left(\frac{k}{k-1}\right)\left(\frac{s^2 - \sum pq}{s^2}\right)$$

Where:

k   : Number of items

s   : Standard Deviation

$\sum pq$: Result of square between p and q

The interpretation of reliability as follows:[21]

The criteria of reliability are :

0.90 – 100   = excellent reliability

0.85 – 0.89   = very good

0.80 – 0.84   = good

0.70 – 0.79   = fair

Less than (0,70)   = poor

From the measurement of reliability of the try out was found that r_{11} = 0.985 >r_{table} = 0.355. For the detail explanation, it could was seen at appendix 9 for the measurement of reliability of the try out.

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[19]Norman E. Gronlund, *Measurement And Evaluation In Teaching (Fifth Edition)*, New York: Macmilan Publishing Company, 1985, p. 14.

[20]Riduwan, *MetodedanTeknikMenyusunTesis*, Bandung: Alfaberta, 2010. p. 119.
[21]*Ibid*, p. 110

G. Data Collection Procedure

To get the data, the writer used some procedures as follows:

1. The writer chose the place of the study.

2. The writer determined two groups, the first group was experiment group and the second group was control group.

3. The writer gave pre test to both classes (experiment group and control group).

4. The writer checked the result of pre test.

5. The writer gave treatment (teaching) to the experiment group using mnemonic device and the writer taught the control group using handout.

6. The writer gave post test to both classes.

7. The writer checked the result of post test.

8. The writer gave score to students' answer (pre test and post test).

H. Data Analysis procedure

To analyze the data has been collected; the writer used some procedures in this study:

1. The writer gave test to the students of the second grade students at MTsNMaliku.

2. The writer collected the data of the students' test result.

3. The writer gave score the students' test result by using the formula:[22]

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[22]AnasSudijono, *PengantarEvaluasiPendidikan*, Jakarta: Rajagrafindo

$$\text{Score} = \frac{B}{N} \times 100$$

Where:

B : Frequency of the correct answer

N : Number of test items

4. The writer tabulated the data into the distribution of frequency of score table, then looking for the mean, median, modus, standard deviation, and standard error of experiment group and control group.

Formula of mean, median and modus:[23]

a. Mean

$$Mx = \frac{\sum fx}{N}$$

Where:

Mx : Mean

Fx : Total result product between each score with frequency

N : Number of case

b. Median

$$Mdn = 1 + \frac{\frac{1}{2}N - fkb}{fi} \times i$$

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[23] Hartono, *StatistikUntukPenelitian*, Yogyakarta: PustakaBelajar, 2011, p. 33.

Where:

Mdn : Median

N   : Number of case

Fkb   : Cumulative frequency located in under interval contain median

Fi   : Authentic frequency (frequency of score contain median)

i   : Interval class

c. Modus

$$Mo = 1 + \frac{fa}{fa + fb} \times i$$

Where:

Mo : Modus

Fa : frequency located in above interval contain modus

Fb : frequency located in under interval contain modus

i   : Interval class

Formula of standard deviation and standard error:[24]

d. Standard Deviation

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[24]*Ibid*, p. 60

$$SD = \sqrt{\frac{\Sigma f x^2}{N}}$$

Where:

SD : Standard Deviation

i : Interval

N : Number of students

e. Standard Error

$$Sem = \frac{sd}{\sqrt{n-1}}$$

Where:

Sem : Standard Error

Sd : Standard Deviation

N   : Number of students

5. The writer calculated normality and homogeneity.

    a. Normality

        Itwasusedtoknowthenormalityofthedatathatisgoingtobe   analyzed
        whether both groups have normal distribution or not. Chi square was used
        here:[25]

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[25]Sudjana,*MetodeStatistika*,Bandung:Tarsito,1996,p.273.

$$\chi^2 = \sum\left[\frac{(f_o - f_h)^2}{f_h}\right]$$

Where:

χ^2 = Chi square

f_o = frequency from observation

f_h = expected frequency

Calculation result of χ^2 was compared with x table by 5% degree of significance. If χ^2 was lower than x table, so the distribution list was normal.

b. Homogeneity

It was used to know whether experimental group and control group, that are decided, come from population that has relatively same variant or not. The formula is:[26]

$$F = \frac{Bigger\ Variant}{Smaller\ Variant}$$

Where:

F : Frequence

The hypotheses in homogeneity:

$F_{value} \leq F_{table}$, means both of variants are homogeneity.

$F_{value} > F_{table}$, both of variants are homogeneity.

If calculation result of F was lower than F table by 5% degree of significance so H_o was accepted, it meant both groups have same variant.

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[26]*Ibid*,p. 280

I. Data Analysis Procedure

To answer the problem of the study about whether the mnemonic give effect or not give effect on the students' vocabulary of the eight grade students at MTsNMaliku, the writer analyzes the obtained data t-test, as follows:

$$\frac{M1 - M2}{SEm1 - m2}$$

Where:

M1-M2   : The difference of two mean.

SEm1-m2 : The standard error of difference between two mean.

With the criteria :

If $t_{test} > t_{tables}$. Ha is accepted and Ho is rejected.

If $t_{tes} < t_{table}$, Ha is rejected and Ho is accepted

The writer uses the level of significansesalpa = 0,05. If the result of $t_{test}$is higher than t_{table}, it means Ha is acepted but if the result of $t_{tes}$is lower thant_{table}. It mean Ho is accepted.

The analyze uses t-test to conclude the answer of the question in the research.

> Test "t" or "t" test, is one of statistic test which is used to examine the truth or the false of nil hypothesis that states if the two Mean Sample which is taken randomly from the same population, there is no significance difference.[27]

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[27]AnasSudjiono, *PengantarStatistikPendidikan*, Jakarta: PT. Raja GrafindoPersada, 2005, p.278

1. If the t_o is equal or greater than t value in the table (with t_t sign), so the nil hypothesis stating that there is no Mean difference from the both sample is refused. It means the difference is significant.

2. If the t_o is less than t_t it means the nil hypothesis stating that there is no Mean difference from the both sample is accepted.[28] It means the difference is not significant.

3. The writer interpreted the result of t-test. The writer accounted degree of freedom (df) with the formula as follows:[29]

$$df = (N1 + N2 - 2)$$

Where:

df : Degree of freedom

N1 : Number of subject group 1

N2 : Number of subject group 2

2   : Number of variable

  1. The writer discussed and concluded the result of data analysis.

J. Summary

To sum up, the steps in collecting, analyzing, and testing hypothesis could was described below. In the first step, the writer chose the place of the study. Second step, the writer gave test of try out (Try out class). Third step, the writer divided subjects

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[28]Ibid

[29]*Ibid*, p. 284

into two groups; experimental group and control group.Fourth step, the writer gave pre-test to the students and the writer gave score (experimental group and control group). Fifth step, the writer was given treatment using mnemonic device for experiment group and the writer was taught using handout for control group. Sixth step, the writer gave post-test and the writer gave score (experimental group and control group). Seventh step, before testing the hypothesis, the writer calculated normality and homogeneity test using SPSS program. Eighth step, the writer tested hypothesis to answer the research problem using t-test formula with manual calculation. Lastly, discussion on the results was made to clarify the finding, as described in figure below:

Figure 3.1 Steps of collecting, data analysis procedure and testing hypothesis

Teaching mnemonic device on Vocabulary learning process atMTsNMaliku

Vocabulary class

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                              ┌──────────┐
                         ↙    Pre-test   ↘
                              └──────────┘
   ┌────────────┐      →                ←      ┌────────────┐
   │ Experiment │  ─────────────────────────→  │  Control   │
   │   Group    │                              │   Group    │
   └────────────┘                              └────────────┘
         │                                            │
         ↓                                            ↓
┌──────────────────────┐              ┌──────────────────────────┐
│ Give Treatment: Teach│              │ Teach without using      │
│ by using mnemonic    │              │ mnemonic device          │
│ device               │              │                          │
└──────────────────────┘              └──────────────────────────┘
         │                                            │
         ↓                                            ↓
   ┌──────────┐                              ┌──────────┐
   │ Post-test│                              │ Post-test│
   └──────────┘                              └──────────┘
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Experiment Group

Pre-test

Control Group

Give Treatment: Teach by using mnemonic device

Teach without using mnemonic device

Post-test

Post-test

Score

Analyzing: Testing Hypothesis using t_{test}

Conclusion

Discussion