**CHAPTER III**

**RESEARCH METHODOLOGY**

* 1. **Research Design**

According to Sugiyono, “Experimental research is research method used looking for influence to do Appointed towards another in condition control”.[[1]](#footnote-1)This research was held that intended to find out whether panel discussion technique could give a significant influence toward students’ mastery of modal auxiliary. In conducting the research writer used quantitative method, in order to know significant influence of using panel discussion technique towards students’ mastery of modal auxiliary. This research waspresented to describe the influence of using panel discussion towards students’modal auxiliarymastery.The writer used two classes as sample of this research. The first was experimental class and the second was control class of the second semester.The writeranalyzed themusing quantitative approach,the research design could be presented as follows:[[2]](#footnote-2)

**G1 : T1 X T2**

**G2 : T1 O T2**

Notes:

G1 : Experimental class

G2 : Control class

T1 : Pre-test

T2 : Post-test

X : Treatment by using panel discussion

O : Treatment by using lecturing technique

The writer analyzed the result of the pre-test and post-test and was compare them. The writer used control group pre-test post-test design measured both control class and experimental class achievement. The pre-test was conducted to both classes before treatments to know the students early achievement. Then the treatment was done to the experimental class while for control class was taught by usual learning technique, which is by using panel discussion technique. The post-test was given to both classes; the comparison was done between the result of the student’s achievement before the treatment and after the treatment. The result of this comparison was inform the writer the technique work or not.

* 1. **Variable of the Research**

There are two variables that are going to be printed out in this research, they are:

1. The indepenndent variable is using panel dicussion technique (x)
2. The dependent variable is the students’ modal auxiliary mastery (y)
	1. **OperationalDefinition of Variable**

The operation definitions of variable are as follow:

1. Panel discussion technique means that can be usedof teaching modal auxiliary by allowing the students to make small group discussion.
2. The students’ modal auxiliary mastery is meant as the students’ ability to in modal auxiliary corectly. This ability was indicated from the testgiven.

**3.4 Population, Sample and Sampling Technique**

**3.4.1. Population**

Arikunto says that “population is all research subject”.[[3]](#footnote-3)While Setiyadi states that all individuals which can be the target in research are called population.[[4]](#footnote-4)So,the population in this researchwasthefirst semester of the eighth class of SMP N 2 Banjit Way kanan in 2015/2016. The number of population is 212 students grouped in four classes. The following is population of SMPN 2 Banjit Way Kanan :

**Table 2**

**The Students of the Eighth class of SMPN 2 Banjit Way kanan**

|  |  |  |
| --- | --- | --- |
| **No** | **Class** | **The Number of Students** |
| 1 | VIII A | 30 |
| 2 | VIII B | 32 |
| 3 | VIII C | 39 |
| 4 | VIII D | 37 |
| 5 | VIII E | 38 |
| 6 | VIII F | 36 |
| **Total** |  | **212** |

 Source: SMPN 2 Banjit, Way Kanan 2015/2016

From six classes the writer took two classes as the sample of the research, they were one as the experimental class and the other one as the control class.

**3.4.2. Sample of the Research**

Arikunto says that sample is the part of population which wasbe investigated.[[5]](#footnote-5)So, the writer took two classes out of the sample in this research. The writer chose two classes one class as experimental class and the other class as control class.

**3.4.3. Sampling Technique**

In this research, the writer used Cluster Random Sampling technique because the population was be in groups and homogenous.[[6]](#footnote-6) The writer wrote the names of each class in several pieces of paper. The paper was rolled and put them in a box. After that the box was shaken. Then the writer took one of the rolled paper and it VIII A as experimental class. The paper rolled again and put it in the box then the box is shaken. After that the writer took one of the rolled paper and it VIII B as control class.

**3.5 Data Collecting Technique**

In conducting this research, the writer needed some ways or technique to collect the data for doing the purpose namely the test, which consists of pre-test and post-test.

1. **Pre-test**

Pre-test was administered before the treatment for 80 minutes. It was done to know the students’ mastery of modal auxiliary before being taught by using panel discussion technique. The test was given to the students by using multiple choice tests which the total numbers of the test are 40 items with four alternative answers each a, b, c, and d, one wasthe correct answers and the rest are distracter. The scoring system is that load of each correct answer five points.

1. **Post-test**

The post test was administered after the treatment for 80 minutes. It was done to find out students’ mastery of modal auxiliary after being taught by using panel discussion technique. The test was given to the students by using multiple choice tests which the total numbers of the test are 40 items with four alternative answers each a, b, c, and d, one was the correct answers and the rest are distracter. The scoring system is that load of each correct answer five points.

**3.5 Instrument of the Research**

Arikunto says that the writer instrument is a device use by the writer during the data collecting by which the work is easier as the data are complete and systematic.[[7]](#footnote-7)It means that instrument used in the collecting data is test. The tests were about modal auxiliary. In this test there are two tests; pre-test and post-test. The pre test and post test was consist of 40 items. The writer used multiple choice with four option A, B, C and D. The following tables of specification of test for pre-test and post-test. In this research the writer used a test to get the data about students’ grammar mastery with phrasal, modal conclusion, modal spontaneity and semi modal especially in the modal auxiliary. The followings the table of specification items of the test before validity :

**Table 3**

**Table of specification of pre-test**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Question** | **Odd** | **Even** | **Number (odd)** | **Number (even)** |
| Ability | 5 | 5 | 1,17,19,27,33 | 6,14,22,36,34 |
| Necessity  | 5 | 5 | 7,13,23,29,31 | 2,10,18,26,38 |
| Advisability | 5 | 5 | 3,15,21,35,37 | 8,12,30,24,40 |
| Possibility | 5 | 5 | 5,9,11,25,39 | 4,16,20,28,32 |
| **Total** | 20 | 20 | 20 | 20 |
| **40** | **40** |

Based on the table above, it can be concluded that there are 40 questions for the test. They are 20 odd questions and 20 even questions. In Abilitythere are 4 odd questions and 4 even questions. The total is 8 questions. In odd questions are 1,17,19,27,33,and in even questions they are6,14,22,34,36,. Then, inNecessitythere are 4 odd questions and 4 even questions. The total is 8 questions. Odd questions they are 7,13,23,29,31,and in even questions they are2,10,18,26,38,. And then, in Advisabilitythere are 4 odd questions and 4 even questions. The total is 8. Odd questions are 3,15,21,35,37and in even questions they are8,12,30,34,40. And the last,Possibility there are 4 odd questions and 4 even questions. The total is 8 questions. In odd questions they are 5,9,11,25,39, and in even questions they are 4,16,,20,28,32

**Table 4**

**Table of specification of post-test**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Question** | **Odd** | **Even** | **Number (odd)** | **Number (even)** |
| Ability | 5 | 5 | 5,13,29,35,37 | 2,8,10,26,34 |
| Necessity  | 5 | 5 | 1,3,17,25,33 | 6,14,22,30,40 |
| Advisability | 5 | 5 | 7,19,23,31,39 | 12,16,20,28,36 |
| Possibility | 5 | 5 | 9,11,15,21,27 | 4,18,24,32,38 |
| **Total** | 20 | 20 | 20 | 20 |
| **40** | **40** |

Based on the table above, it can be concluded that there are 40 questions for the test. They are 20 odd questions and 20 even questions. In Ability, Possibility there are 4odd questions and 4 even questions. The total is 8 questions. In odd questions are 5,13,29,35,37and in even questions they are2,8,10,26,34. Then, inNecessity, there are 4 odd questions and 4 even questions. The total is 8 questions. Odd questions they are 1,3,17,25,33, and in even questions they are6,14,22,30,40. And then, in Advisabilitythere are 4 odd questions and 4 even questions. The total is 8. Odd questions are 7,19,23,31,39and in even questions they are12,16,20,28,36. The last Possibility there are 4 odd questions and 4 even questions. The total is 8 questions. In odd questions they are 9,11,15,21,27 and in even questions they are 4,18,24,32,38.

**Table 5**

**Table of specification of pre-test after validity**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Question** | **Odd** | **Even** | **Number (odd)** | **Number (even)** |
| Ability | 2 | 3 | 1 ,27 | 6,14,36 |
| Necessity  | 2 | 1 | 13,,29, | 10 |
| Advisability | 3 | 2 | 3,21,37 | 8,40 |
| Possibility | 3 | 2 | 9,11,39 | 16,20 |
| **Total** | 10 | 8 | 10 | 8 |
| **18** | **18** |

Based on the table above, it can be concluded that there are 18 questions for pretest. They are 8 in odd questions and 11 even questions. Ability there are2 odd questions and 3 even questions. The total is 5 questions. In odd questions, number 1,27and in even questions, number 6,14,36. In necessity there is 2 in odd questions and 1 in even questions. The total are3 questions. In odd questions, number 13,29and in even questions, number 10. In advisability there are 3 in odd question, and 2 in even question. The total is 5. In odd question, number 3,21,37. and in even questions, number 8,40. The last is possibility there is 3 in odd questions, number 9,11and 2 in even questions number 16,20.Based on the table above, it can be concluded that there are 18 questions for pre test.

**Table 6**

**Table of specification of post-test after validity**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Question** | **Odd** | **Even** | **Number (odd)** | **Number (even)** |
| Ability | 2 | 1 | 5 ,29 | 2 |
| Necessity  | 2 | 4 | 1,17 | 6,14,22,40 |
| Advisability | 4 | 2 | 7,19,23,31 | 16,20 |
| Possibility | 3 | 2 | 9,11,15 | 18,38 |
| **Total** | 11 | 9 | 11 | 9 |
| **20** | **20** |

Based on the table above, it can be concluded that there are 20 questions for pretest. They are 11 in odd questions and 9 even questions. Ability there are2 odd questions and1 even questions. The total is 3 questions. In odd questions, number 5,29and in even questions, number 2,. In necessity there is 2 in odd questions and 4 in even questions. The total are 6 questions. In odd questions, number 1,17, and in even questions, number 6,14,22,40. In advisability there are 4 in odd question, and 2 in even question. The total is 6. In odd question, number 7,19,23,31. and in even questions, number 16,20. The last is possibility there is 3 in odd questions, number 9,11,15 and 2 in even questions number 18,38. Based on the table above, it can be concluded that there are 20 questions for pre test.

**3.6 Research Procedure**

These are the following research procedure, there were three steps done in research procedure, they are:

* + 1. **Planning**

Before applying the research procedure, the writer wasmade some planning to run the application well. There are some steps that was planned by the writer.

The procedure of making planning of this research can be seen as follows:

1. Determining the subject

The writerdetermined the subject; in this phase the writer chose theeighthclass of SMPN 2 Banjit Way Kananas the subject of the research, one class as the experimental class and the other one as the control class.

1. Preparing the try-out

The writerprepared a kind of test (called try-out test) that was given to the students.The writerused the try-out in try out class. Then the writer calculated the test item to get good items that wastest in pre- test.

1. Preparing the pre-test

The writer prepared a test (pre-test) that wasgiven to the students. The writerused the test instrument that has already triedout before. The test is multiple choices consist of 18 items with options a, b, c, and d.

1. Determining the material to be taught

The writer determined the material that was taught to the students and the material was modal auxiliary.

1. Preparing the post-test.

The writer prepared a test (post-test) that was given to the students. The testsis 20 items with 4 options a, b, c and d.best on the result ofpost-test, the researcher knew how far the students’ mastery of modal auxiliary.

**3.7.2 Application**

After making the planning, the writer tried to apply the research procedure that has been already planned.

There are some steps in doing this research:

1. In the first meeting, the writer gave try-out

This test was multiple choices that are consists of 40 items with 4 options a, b, c and d.

1. In the second meeting, the writer gave pre-test.

The test was multiple choices consist 18 with 4 options a, b, c and d. The total number of the test items was determined by the validity and reliability analysis of the try out. It means that only the valid and reliable test item was used in the pretest.

1. After giving the pre-test to the students, the writer conducted the six meeting there are three meeting in experimental class and three meeting in control class. The writer conducted the treatment with panel discussion technique, while in control class the writer conducted the treatment with ordinary technique.
2. In the last meeting, the writer gave post-test.

The test was multiple choices consist 20 with 4 options a, b, c and d. The total number of the test items was determined by the validity and reliability analysis of the try out. It means that only the valid and reliable test item was used in posttest.

* + 1. **Reporting**

The last point that had been done in the research procedure is reporting. There are three steps which wasdone in reporting. The steps are as follows:

a. Analyzing the data that is already received from tryout test.

b. Analyzing the data that is already received from pre-test and post-test.

c. Making a report on the findings.

* 1. **Scoring System**

Before getting score, the writer determined the procedure was used in scoring the students’ work. In order to do that, the writer usedArikunto’s formula. The ideal highest score is 100.

The scores of pre-test and post-test were calculated by using the following formula:



Notes:

S : The score of the test

r : The total of the right answer.

n : The total items.[[8]](#footnote-8)

* 1. **Validity and Reliability**

A test can be said valid, if the test measure the object to be measured a suitable with the criteria. The criteria of the good test are validity (content and construct vlidity) and reability.

**3.8.1 Validity of the Test**

According to Arikunto, he says that validity is a measurement which shows the level of validity or the real of the instrument. A valid instrument has a high validity. On the other hand, the instrument which lack of valid has a low validity.[[9]](#footnote-9) While Setiyadi says that generally, validity is a measurement to show how far the measurement measures something that must be measured.[[10]](#footnote-10) In this research, there are several aspects considered to measure validity of a test. They are:

1. Content Validity

Content validity is the extent to which a test measured a representative sample subject matter. The focus is on the adequacy of the sample and not simply on the appearance of the test. In short, the test items should represent the material being discussed. It means that the test designed based on the curriculum in the school. To get the content validity, the test adapted with the students’ book. The test is suite with the material was taught to the students. Setiyadi says that if a measurement has represented all of ideas which are related to the material that was measured, the measurement has filled up the aspects from the content validity.[[11]](#footnote-11) It means that the test is designed based on the current curriculum in the school.

To get the content validity of the modal auxiliary test, the writer tried to arrange the materials base on the objectives of teaching in the school base on curriculum for the eighth class of SMPN 2 Banjit Way Kanan. Then, the writer asked the senior teacher of SMPN 2 BanjitWay Kanan to check and evaluate those items.

b. Construct Validity

Construct validity is concerned with whether the test is actually in the line with the theory of what it means to know the language. It focuses on the kind of the test that is usedto measure the ability. It means that the items should test the students whether they had mastered the simple present tense.

Construct validity refers to assumption, showing the measurementused contains correct operational definition, which is based on the theoretical concept. In other words, construct validity is just like a concept; both of them are abstraction and generalization that need to be defined so clearly that can be measured and be examined.

Construct validity wasfocus on the kind of test that use to measure the ability. In other words, test can measure what needs to be measured. In this research, the writer administered a grammar test. To make sure, the writer consulted the instrument to the English teacher.

1. Internal Validity

To know the validity of the test, the writer used point biserial correlation formula. The formula for validity is as follows:

$$r\_{pbi}= \frac{ M\_{P}–M\_{t}}{SD\_{t}}\sqrt{\frac{p}{q}}$$

 $r\_{pbi}=\frac{M\_{p-M\_{t}}}{SD\_{t}}\sqrt{\frac{p}{q}}$rpbi = The Number of Correlation Index Biserial

Mp = Mean of Average Score

Mt = Mean of Total Score

SDt = Standard of Total Deviation

p = Proportion of Test participatory

q = proportion of the students who get wrong answer[[12]](#footnote-12)

The first step of pretest try out,there were 26 items considered valid. They were the items number 1, 3, 6, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25, 27, 28, 29, 36, 37, 39 and 40. There were 14 items considered invalid. They were the items number 2, 4, 5, 7, 12, 24, 26, 30, 31, 32, 33, 34, 35, and 38.After dropping those invalid items, the writer did the second step of pretest try out calculation. In this step 18 items were found valid; they were the items number 1, 3, 6, 8, 9, 10, 11, 13, 14, 16, 20, 21,27, 29, 36, 37,39 and 40. There were 8 items were found invalid, they were the items number 15, 17, 18, 19, 22,23, 25, and 28. Finally the total valid items in pretest try out were 18 items.

While in the posttest try out, there were 28 items considered valid. They are 1, 2, 5, 6, 7, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25, 26, 27, 29, 31, 36, 37, 38 and 40. There were 12 items considered invalid. They were the items number 3, 4, 8, 12, 24, 28, 30, 32, 33, 34, 35 and 39. After dropping those invalid items, the writer did the second step of posttest try out calculation. In this step 8 invalid, they were the items number 10, 13, 21, 25, 26, 27, 36 and 37. There were 20 items considered valid, they were the items number 1, 2, 5, 6, 7, 9, 11, 14, 15, 16, 17, 18, 19, 20, 22, 23, 29, 31, 38 and 40. Finally the total items in post test try out were 20 items.According to Sudjiono, if the result of the item test is less than 0.361, this item is invalid.[[13]](#footnote-13)Therefore, an invalid item cannot be used to collect the research data.

An item is considered valid if the score of validity is >0.361. It was based on the product moment where the t-critical for 30 subjects with alpha 0.05 was 0.361.

1. **Reliability of the Test**

According to Arikunto, reliability shows that an instrument can be believed to be used as a tool of data collecting technique when the instrument is good enough.[[14]](#footnote-14)Reliability refers to whether the test is consistent in its scoring and give us an indication of how accurate the test scores are. To see the reliability of the test, the writer use Kuder Richardson ( KR) - 20 formula as follows

$$r 11\left[\frac{K}{K-1}\right]\left[\frac{Vt-\sum\_{}^{}pq}{Vt}\right]$$

Notes:

 : the instrument reliability

 *k* : the number of items

 : total variance

p : the proportion of correct answer

 q : the proportion of incorrect answer[[15]](#footnote-15)

Then the result was conduct to the criteria of reliability as follow:

1. 0.800-1.000 high reliability
2. 0.600-0.800 enough reliability
3. 0.400-0.600 rather low reliability
4. 0.200-0.400 low reliability
5. 0.000-0.200 very low reliability [[16]](#footnote-16)

From the data gained, the reliability of pretest was 0.93, while the reliability of the posttest was 0.94. Then these resulted were to be consulted the category of reliability test. Based on the category, it was known that the reliability tests of pretest and posttest were very high reliability since score of reliability test on 0.800-1.00

1. **Data Analysis**

The data that gained is statistically analyzed by using techniques and steps as follow:

* + - 1. **Normality Test**

The writerused normality test to know whether the data have normal distribution or not. Here, the test of *Liliefors*was be used.[[17]](#footnote-17) When the data have been collected, so the normality test as follows:

1. The hypotheses formula are:

Ho = the data have normal distribution

Ha = the data do not have normal distribution

1. The average rates (x) are calculated by formula:

x = $\frac{Ʃ x1}{n}$

notes:

x1: the score achieve by students

n: the total of students

1. Variant (S2) calculated by formula:

S2 = $\sqrt{\frac{n x\_{1 }^{2}- \left(Ʃ\_{1}\right)^{2}}{n (n-1)}}$

Notes:

x1: the score achieve by students

n: the total of students

1. The test of hypotheses as follows:

1. For x1, x2, x3, ... , xn assumed as number z1, z2, z3, ... , zn by use the formula: zi = xi – xbar

2. For each this absolute number is arrange in the normal distribution, then it calculated F (zi) = P (z ≤ zi)

3. Next calculate the proportion z1, z2, z3…., zn then can be smaller or just the same as zi. The proportion is represented by S (zi) = $\frac{z1,z2,z3,…zn}{n}$

4. Calculate F (zi) – S (zi) and calculate the absolute number

5. Calculate the highest number among those absolute numbers and call the number as t-*observed*.

1. The criteria are as follows:

Ho is accepted if L*observed* ≤ L*critical*, it means that the distribution of the data is normally distributed.

Ho is refused if L*observed* ≥ L*critical*, it means that the distribution of the data is not normally distributed.

* + - 1. **Homogeneity Test**

After the normality test, the writer determined the homogeneity of the test. Homogeneity test used to know whether the data in experimental class and control class are homogeneous or not. In this case, fisher test of two variances wasused to know the homogeneity of the test, the formula as follow:

 F $\frac{S\_{1}²}{S\_{2}²}$ , where S ² = $\frac{n\sum\_{}^{}X²-\left(\sum\_{}^{}X\right)²}{n\left(n-1\right)}$

Note:

F : Homogeneity

$S\_{1}²$ : The highest variance

$S\_{2}²$ : The lowest variance

The hypothesis for the homogeneity test formulated as follows:

H0 : data have the homogenous variances

Ha : data have not homogenous variances

There are the criteria of homogeneity test:

H0 is accepted if Fobserved< F critical

H0 is rejected if Fobserved> F critical[[18]](#footnote-18)

* + - 1. **Hypothetical Test**

The data were analyzed by using T-test in order to know the significant of the treatment effect. Before using the T-test the writer determined the variant (S²) students.

The T-test formula is:

 

Note :

M : Mean of scores of each group

N : The total number of students

x : Deviation of each scoresand 

y : Deviation of each from mean of .[[19]](#footnote-19)13

The hypotheses are:

Ho : there is no significant influence of using panel discussion towards students’ modal auxiliary mastery at the first semester of the eighth class in SMPN 2 Banjit in 2016/2017 academic year

Ha : there is significant influence of using panel discussion towards students’ modal auxiliary mastery at the first semester of the eighth class in SMPN 2 Banjit in 2016/2017 academic year

While the criteria of the test are:

$H\_{o}$is refused, if the score of tobserved< t critical**,** in other case $H\_{o}$administered.

Ha is accepted, if the score of tobserved> t critical**,** with α = 0.05 (5%).[[20]](#footnote-20)

1. Sugiyono, *MethodePenelitianKuantitatif, Kualitatif ,dan R & D*, Bandung, alfabeta 2010,p.72 [↑](#footnote-ref-1)
2. Ag.BambangSetiyadi, *MetodePenelitianuntukPengajaranBahasaAsingPendekatanKuantitatifdanKualitatif,* Yogyakarta, GrahaIlmu, 2006, p. 143 [↑](#footnote-ref-2)
3. SuharsimiArikunto, *Procedure PenelitianSuatuPendekatanPraktek*, Jakarta, RinekaCipta, 2006, p.130 [↑](#footnote-ref-3)
4. Ag.BambangSetiyadi, Op.Cit. p.38 [↑](#footnote-ref-4)
5. SuharsmiArikunto, Op, Cit. p.131 [↑](#footnote-ref-5)
6. Sugiyono, Op.Cit.p.120. [↑](#footnote-ref-6)
7. SuharsimiArikunto, Op.Cit. p.149 [↑](#footnote-ref-7)
8. SuharsimiArikunto, Op.cit p. 271 [↑](#footnote-ref-8)
9. SuharsimiArikunto, Op. Cit,p.168 [↑](#footnote-ref-9)
10. BambangSetiyadi, Op. Cit.p.22 [↑](#footnote-ref-10)
11. *Ibid* p. 23 [↑](#footnote-ref-11)
12. AnasSudijono.*PengantarEvaluasiPendidikan.*Rajawali Press: Jakarta.1996 p.185 [↑](#footnote-ref-12)
13. *Ibid*. p. 402. [↑](#footnote-ref-13)
14. SuharsimiArikunto, *Op.Cit*.,p.178 [↑](#footnote-ref-14)
15. *Op.Cit*, p.188. [↑](#footnote-ref-15)
16. *Opcit.*p.257 [↑](#footnote-ref-16)
17. Nana sudjana*.metodestatistika,* Bandung, 2005 p: 466 [↑](#footnote-ref-17)
18. Sudjana, *MetodeStatistika.*Trasito. Bandung: 2002,p. 249 [↑](#footnote-ref-18)
19. 13SuharsimiArikunto, *Op.cit*, p. 311 [↑](#footnote-ref-19)
20. Suharsimi, Arikunsto, *Op Cit*, p. 309 [↑](#footnote-ref-20)