CHAPTER III

RESEARCH METHODOLOGY

In this chapter, the writer describes the method of the research. It consists of (1) Research design, (2) Research variable, (3) Research population and sample, (4) Data collection technique and research instruments, (5) Variable and reability (6) Research procedure, (7) Data analysis technique and (8) Hypotheses.

A. Research Design

This study examines the use of problem sticks as teaching media to teach speaking on asking for and giving opinion in speaking skill in order to help teacher to know the student active for speaking skill or not. The research design used in this study is quasi experimental design. Quasi-experimental is a design of research which needs two groups to be tested.[1] The groups that are already available at the place of the research should have almost the same ability. Thus, the researcher takes two classes which have almost the same ability and they are already available in the school.

In this research, the researcher explores how problem sticks is used to teach the students, how problem sticks can improve students' speaking skill and whether the students who are taught speaking material of expression through problem sticks have better speaking or not. So, there are two classes which are taken as the sample of this study. One class is the experimental group and the other class is the control group. The experimental group gets some treatments

[1]M. Adnan Latief, *Tanya Jawab Metode Pembelajaran Bahasa* (Malang:UM Press, 2010) , 117-121.

about speaking material of expression through problem sticks and the control group does not get the treatments about speaking material of expression through problem sticks.[2] The research steps in the experimental group are pre-test, treatments, post-test. The pre-test explores the students' speaking skill before they get the treatments. The post-test is given to the students after they get the treatments. Therefore, the data for the research are collected from the scores of two pre-test and the two post-test and then the data are analyzed and evaluated using the *t-test*. The design of the experiment can be illustrated as follows:

Table 3.1

Illustrated of Experimental Design

Group	Class	Subject	Pre - test	Treatment	Post – test
E	Eight – 1	38	Y^1	X	Y^2
C	Eight – 2	40	Y^1	-	Y^2

In which:

E : The experimental group that is taught problem sticks technique.

C : The control group that is taught without problem sticks technique.

Y1 : The pretest distributed before the experimental treatment

Y2 : The posttest distributed after the experimental treatment

X : The independent variable or the treatment.

[2] William M. K. Trochim, *The Research Methods Knowledge Base* (Cambridge: Cambridge University Press, 1995), 216.

B. Research Variable

Variable of this research is what is researched by the researcher.[3] A variable is any entity which is determined by the researcher to be studied in order to gain the information, then will be concluded. There are two variable examined in this research. Those are independent and dependent variable.

1. Independent variable

   This variable is also called stimulus, predictor or antecedent variable. Independent variable is variable which will give effect to dependent variable.[4] In this study, the independent variable is problem sticks as teaching media.

2. Dependent variable

   It is also called output, criteria or consequent variable which will get effect or cause from independent variable.[5] In this study, the dependent variable used is the students' speaking.

C. Population and sample

1. Population

   The population of the study is the eighth graders of SMPI Brawijaya Pungging, Mojokerto in academics year of 2013/2014. This school consists of four classes. Each class consists of 38 students.

2. Sample

   The researcher takes two classes which have almost the same characteristic. The researcher takes A class and B class because both classes are taught by

[3] Sugiono, *Statistika Untuk Penelitian* … 2.
[4] Sugiyono. *Statistika Untuk Penelitian*... 4.
[5] Sugiyono. *Statistika Untuk Penelitian*… 4.

the same teacher. To decide which control group and experimental group, the researcher flipped a coin.

D. Data Collection Technique and Instrument

1. Data collection technique

The data is gotten from the assessment and questionnaire:

a. Assessment

The researcher gives test to the students by using problem sticks as teaching media to teach speaking skill.

b. Questionnaire

Questionnaire is data collection technique which gives a set of question or written explanation in order to be answered by respondent. In constructing the questionnaire, the writer uses closed questionnaire. It means that the respondents answer the questions by choosing one of the answers given by the researcher. In this study, the writer uses questionnaire to get information about students' responses after using problem sticks in learning process.

2. Instrument

The researcher uses some instruments which help the researcher getting the empirical data and drawing the conclusion or the result of this research easily. The instruments are pre-test, post test and questionnaire.[6]

[6] Sugiono, *Metode Penelitain Kuantitatif , Kualitatif dan R&D* (Bandung: Alfabeta, 2008) , 148.

1. Test

   The test (pre-test and post test) is to identify the quality of students' speaking before and after treatment. It is intended to administer in order to gain the needed data. The criteria of speaking score include some component such pronunciation, grammar, vocabulary, fluency and comprehension. There are some steps to conduct the test:

   a. Pre-test

      Pre-test is conducted to measure participants' attributes or characteristics before they get the treatment. The researcher administers pre-test to find out both groups' speaking skill before they get different treatments.

   b. Post-test

      Post-test is held to measure the participants' attributes or characteristics after they get the treatments. The post-test is held after the researcher uses problem sticks as the treatment to the experimental group and conventional teaching to the control group.

Then the researcher uses rubric analytical scoring adapted from Arthur Hughes to give score to the students. The criteria of speaking score included some components such as grammar, vocabulary, comprehension, fluency, and pronunciation. The students' scores are given in the form of number to enable the researcher calculates and finds the result from the test.

2. Questionnaire list

Questionnaires are the second step to collect the data. Questionnaire is some questions to the students about some problems that have purpose to get opinion of the students.[7] The students must answer about the question based on what they responses toward the use of problem sticks as teaching media.

In this study, the questionnaire is to find what student responses at last of teaching and learning process and to know their reason about it. The researcher gives the question sheet to the students at the last meeting. The questionnaire consist of 10 questions (see appendix)

In advance, the advantages of questionnaire are the researcher is not necessarily present in front of the respondents, but it can be shared directly to many respondents; the question can be answered by the respondents as fast as their own and depend on their part times, can be anonymous, so respondents will feel free, honest, and confident to answer and can be standard in similar questions for all respondents.

E. Validity and Reliability

A good instrument should be valid and reliable.[8]The researcher needs to analyze the validity and the reliability of the instruments which are used in this study. The concept of validity and reliability are discussed below:

1. Validity of test

   Validity means the extent to which an instrument measures what should be measured.[9] The instrument is valid while the instrument which is used in

[7] Suharsimi Arikunto, *Prosedur Penelitian. Suatu Pendekatan Praktik* (Jakarta: PT. Rineka Cipta, 2006), Rev. VI, 124.
[8]Arikunto Suharsimi, *Prosedur Penelitian* (Jakarta: Rineka Cipta, 1975), 143.

the research can be used to measure what the researcher wants to measure.[10] So, the validity and the instrument of the research are interrelated. In this research, the researcher uses content validity. The standard of content validity is the degree to which the sample of items, tasks, or questions on a test are representative of some defined universe or domain of content.[11]

2. Reliability of test

   The test of reliability of the instruments can be done externally or internally. The external test can be done using test-retest (stability).[12] The researcher uses correlation product moment technique to find r_i to measure the reliability of the instrument

$$r_i = \frac{n \sum X_i Y_i - (\sum X_i)(\sum Y_i)}{\sqrt{\left[n \sum {X_i}^2 - (\sum X_i)^2\right]\left[n \sum {Y_i}^2 - (\sum Y_i)^2\right]}}$$

N = the number of the students

X_i = Pretest score of try-out

Y_i = Posttest score of try-out

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[9] Donald Ary, et. al, *Introduction to Research in Education* (Wadsworth: Cengage Learning, 2010), 316.
[10]Sugiono, *Statistika Untuk Penelitian…*348.
[11]Ary, et. al, *Introduction to Research in Education* (UK: Cambridge University Press, 2003), 225.
[12]Sugiono, *Statistika Untuk Penelitian…* 354.

The criteria to interpret the reliability of the test based on Brown:[13]

Table3.2

Reliability of the Test

SCALE	LEVEL OF RELIABILITY
0.00 – 0.20	Not reliable
0.20 – 0.40	Less reliable
0.40 – 0.60	Reliable enough
0.60 – 0.80	Reliable
0.80 – 1.00	Very Reliable

Below is the result of the try-out:

$$r_i = \frac{n\Sigma X_i Y_i - (\Sigma X_i)(\Sigma Y_i)}{\sqrt{\left[n\Sigma {X_i}^2 - (\Sigma X_i)^2\right]\left[n\Sigma {Y_i}^2 - (\Sigma Y_i)^2\right]}}$$

$$r_i = \frac{20\ .\ 78977 - (1198)(1308)}{\sqrt{[20\ .\ 72702 - (1198)^2][20\ .\ 86218 - \ (1308)^2]}}$$

$$r_i = 0{,}78$$

The result of the try-out shows that the value of the reliability of the test is 0.78. Based on the table of criteria of the reliability of the test, 0.78 is reliable. Thus, the test can be used as the instrument of this research.

F. Research Procedure

The research procedure is divided into 4 steps. There are pretest, treatment and questionnaire. The researcher collects the data taken from the students'

[13]Dwi Wahyu Sugiarti, *The Effectiveness of Clustering Technique in Teaching Writing atThe Eighth Grade ofMTs Raudlatul Ulum*, (Surabaya: IAIN, 2010), 26

pretest and posttest score. The pretest and posttest scores are collected from experimental and control group. The research schedule can be seen on the table below:

Table 3.3

Research Schedule

No.	Day / Date	Activity	Class / Group
1	Tuesday, June 11th 2013	Pretest	VIII-B (Experimental Group) VIII-A (Control Group)
2	Wednesday, June 12th 2013	1st Treatment Introduction of Problem sticks 1st Meeting Introduce and explain the topic based on the syllabus on speaking skill	VIII-B (Experimental Group) VIII-A (Control Group)
3	Wednesday, June 19th 2013	2nd Treatment Practice speaking by using problem sticks and give some examples 2nd Meeting Teaching speaking using conventional teaching	VIII-B (Experimental Group) VIII-A (Control Group)
4	Friday, June 21st 2013	Posttest	VIII-B (Experimental Group) VIII-A (Control Group)

1. Experimental group

The students of VIII-B are the member of experimental group. In the experimental group, the researcher divides in four meetings. The first meeting covers pretest, the second meeting is 1st treatment; the third meeting is 2nd treatment, and posttest. The students are taught using problem sticks as the treatment for the experimental group.

a. Pretest

The pretest was held on Tuesday, June 11th 2013. The aim of conducting pretest is to know the students' speaking skill before they receive the treatment.

b. 1st Treatment

The following step is the implementation of the treatment for experimental group by applying problem sticks. The first treatment was held on Wednesday, June 12th 2013. The topic is "Holiday". The researcher set up situation that focus students attention on the structure of the language. The researcher work with the students, the researcher gave some examples to the students by problem sticks. After that, the researcher asks the students to understand their reaction to the lesson or what they have learned.

c. 2nd Treatment

The second treatment was held on Wednesday, June 19th 2013. The topic is the same as in the first treatment. In experimental group, the researcher elaborates how to use problem sticks at expression of asking for and giving opinion. The researcher

indicated that each of group represented how to pronounce material of asking for and giving opinion. After that, the student tried that activity with the other group.

d. Posttest

The posttest was held on Friday, June 21st 2013. The aim is to know the students' enhancement progress after getting treatments. The researcher conducted posttest for 90 minutes.

2. Control Group

The members of control group are the students of VIII-A. There were also four meetings in control group. The four meetings include pretest, 1st meeting, 2nd meeting, and posttest. The students weren't taught using problem sticks but conventional teaching.

a. Pretest

The pretest was held on Tuesday, June 11th 2013. The researcher conducted pretest for 90 minutes. It is also for measuring the students' achievement before getting treatment.

b. 1st Meeting

The 1st meeting was conducted on Wednesday, June 12th 2013. The researcher uses English Students' workbook based on the syllabus for the control group.

c. 2nd Meeting

The 2nd meeting was held on Wednesday, June 19th 2013. In the second meeting, the researcher elicited the students about what

they have learned in the previous meeting. They discussed the topic on the workbook and presented it in front of the class to practice speaking.

d. Posttest

The posttest was conducted on Friday, June 21st 2013. It is aimed to get the result of the students' improvement after they were taught using the conventional teaching. The researcher conducted the posttest for 90 minutes.

G. Data Analysis Procedure

In this research, the researcher collects the data from test and questionnaire. The tests are used to find out how problem sticks improves students' speaking skill and whether students who are taught through problem sticks have better speaking skill than those who are not taught through problem sticks. The researcher uses rubric speaking skill adapted from Arthur Hughes (*See appendix 6*) to score the students' speaking skill. The tests consist of pretest and posttest. The students' posttest score from both experimental and control group is analyzed through T-test. T-test is used to test the comparative hypothesis of two samples if the data is in interval or ratio.[14] Afterward, the result of the T-test, t-value, is compared with t-table to find out which hypothesis is accepted or rejected.

The analysis procedures are as follows:

1. Scoring of the test

[14]Sugiyono. *Statistika Untuk Penelitian*… 121

The researcher uses speaking rubric which is adapted from Arthur Hughes to score the students' speaking skill for the test. The speaking rubric includes 5 categories of scoring the students' speaking skill. The categories are pronunciation, grammar, vocabulary, fluency and comprehension.

2. T-test

T-test is used for comparative hypothesis of two samples if the data is in interval or ratio.[15] It is aimed to compare if the students' score of the test from both experimental and control group are significantly different. By using t-test formula, the researcher calculates the students' posttest score from experimental and control group.[16] The terms in using t-test should be in normal distribution and homogenous variants. Thus, the researcher needs to check whether the data distribution is normal and homogenous variants or not. To check the normal distribution is through normality test. Meanwhile, the homogeneity test is also needed to be calculated to find the homogenous variants. The normality test and homogeneity test are calculated as follows:

a. Normality test

The researcher uses normality test to check whether the posttest score of experimental group and control group are normally distributed or not. There are some steps to calculate the normality test. The steps are:[17]

[15]Sugiyono. *Statistika Untuk Penelitian*…121.
[16]Anas Sudjiono, *Pengantar Statistik Pendidikan*, (Jakarta: PT. Raja GrafindoPersada, 2006), 314.
[17]Sugiyono. *Statistika Untuk Penelitian* ...80.

1. Determine the number of interval class. For normality using Chi Square test, the number of interval is 6. This appropriate with 6 fields in Real Normal Curve.
2. Determine the length of interval class, the formula is:

$$The\ length\ of\ interval\ class = \frac{biggest\ data - smallest\ data}{6\ (the\ number\ of\ interval)}$$

3. Arrange the data into a frequency distribution table

Table 3.4

Normality Test Table

Interval	f_0	f_h	$f_0 - f_h$	$(f_0 - f_h)^2$	$\frac{(f_0 - f_h)^2}{f_h}$
Total					

f_0= Frequency / the number of data from the result of post-test

f_h = The number / frequency of the expected (percentage area of each field multiplied by *n*)

$f_0 - f_h$= The differences between$f_0$danf_h

4. Calculate f_h (the frequency of the expected)
5. Calculate f_h, based on the percentage area of each field in normal curve, and then multiplied by the number of data from the result of post-test (the number of individuals in the sample).
   - The first line : 2,7 % X *n*

- The second line : 13,53 % X *n*
- The third line : 34,13 % X *n*
- The fourth line : 34,13 % X *n*
- The fifth line: 13,53 % X *n*
- The sixth line: 2,7 % X *n*

6. Insert the value of $f_h$to the $f_h$column table, and then calculate the value of $(f_0 - f_h)^2$and$\frac{(f_0 - f_h)^2}{f_h}$. The value of $\frac{(f_0 - f_h)^2}{f_h}$is the calculated value of Chi square(x^2).
7. Compare the calculated Chi square value to the Chi square table. $X^2_{\text{table}}$is 9.48.

b. Homogeneity test

Homogeneity test is used to check whether the posttest score of experimental and control group have similar variance or not. The followings are steps of homogeneity test, there are:

1) Find the biggest variant score and the smallest variant score, the formula is:

$$F_{score} = \frac{{S_1}^2}{{S_2}^2}$$

Explanation:

S_1^2 = the larger variance

S_2^2 = the smaller variance

2) Compare F_{score} with F_{table} , the criteria is $F_{score} < F_{table.}$ It is mean the homogeneity and comparative test will go on.

3. After that, the last analysis is for questionnaire technique. This data is to answer second problem. The researcher calculates the frequency of each response (optional formation) of every question by using the formula below:

$$\text{The score} = \frac{\text{The Total Earned}}{\text{Total of Students}} \times 100\%$$

H. Research of Hypotheses

The researcher needs to check and compare the result of t-test (t-value) to the t-table.

1. If the t-value is more than the value in the t-table ($t_{value} > t_{table}$), it means that H_a is accepted and H_0 is rejected. So, students who are taught through problem sticks have better speaking skill than those who are not taught through problem sticks.
2. In the other hand, if the t-value is less than the value in the t-table ($t_{value} < t_{table}$), it means that H_0 is accepted and H_a is rejected. Thus, students who are not taught through problem sticks have better speaking skill than those who are taught through problem sticks.