CHAPTER III

RESEACH METHODOLOGY

This chapter discusses research methodology applied in the research. It comprises research design, data collection, research procedure, and technique for analyzing the data.

3.1 Research Design

This research is experimental research with quasi-experimental design. As stated by Gay et al (2006), quasi experimental involves some basic characteristics, among others are; the control group, the experimental group, pre-test, post-test and treatment. There were two groups taken as the investigated groups. One group is for the experimental group that has received problem-based learning in teaching speaking in its treatment; and the other group is for the control group that receives non treatment.

There are two reasons for choosing the design. First, quasi experimental design was chosen because true experimental design was not feasible. Second, because of limited time and cost, it was quite impossible to involve control or comparison's group in this study. There were two challenges in conducting quasi experimental, beside the time was limited, in control group, it is difficult to manage the external variables which affect the result of the study (Sugiyono, 2008). However, the researcher tried to ensure the intervening variable to the control group in neutralizing the effect of the method used from the possibility of external variables such as set the same time allocation either to the experimental or control group and the second one is not to involve the out layers; so the samples have same capability in the equal level.

In this research there are two variables to investigate namely independent variable and dependent variable. This study has two variables as well; the use of problem-based learning as

the independent variable and students' speaking ability as the dependent variable. Meaning that speaking test was employed to find out whether there were significant changes in experimental group after having been given problem-based learning technique or not. The research design can be illustrated as follow:

Table 3.1

G1 T1 X T2
G2 T1   T2

(Sugiyono, 2008: 116)

G1 : experimental group

G2 : control group

X : the treatment through the use contextualization that belongs to experimental group

T1 : pre-test belongs to both of experimental and control groups

T2 : post-test belongs to both of experimental and control groups

In addition to answer the research question null hypothesis was needed as the research foundation. Hypothesis is a prediction of some sort regarding the possible outcomes of a study.

H_o: $\mu 1 = \mu 2$

In null hypothesis, it states that "there is no difference in mean adjustment level between the class using Problem-based learning as treatment and class without using Problem-based learning."

3.2 Data Collection

There were some procedures and instruments which were utilized in this research in order to reveal any important data to answer the research questions. Population and sample, instruments and procedures of the research in gaining the data are presented as follows:

3.2.1. Population and Sample

The population of this research was the second grade students of Vocational school in Cimahi. The sample of the research was two classes, it has been chosen purposely. This technique was employed by considering certain conditions. The first class was XI Administrasi perkantoran 2 as control group and the second class was XI Akunansi 1 as experimental. Both of classes consisted of 40 students.

3.2.2 Research Instruments

To answer the research questions this research will use three instruments namely pre-test, post-test and questioner. Sugiono (2008) states instrument is a media used to collect the data. These three instruments are described as follow:

Pre-test was conducted to figure out the initial differences between the groups of students who have similar level of speaking competency. It has been given to both of the group; control and experimental. **Post-test** was employed in the end of the research. It has been done after giving treatments and exercises to the experimental group. The result of the post-test is used to compare with the data of the pre-test and analyze the Problem-based learning effectiveness.

Questionnaire was done after finding the data from pre-test and post-test. The questioner comprises of a set of questions concerning with students' attitude toward Problem-based

learning. The result of the interview depicted students' responses toward Problem-based learning.

3.3 Organizing Teaching Procedure

This research was begun by conducting the pre-test in measuring students' speaking ability. Afterwards, treatments were given to the experimental group namely Problem-based learning; however the control group was given treatments like. Before starting to teach the class, teacher prepared lesson plan. It comprises of competency standard, basic competence, indicators, aims of learning, teaching-learning methods, materials, learning steps and media.

After having preparations, teacher will teach instructional material concerned with describing profession, educational background, curriculum vitae and future plan which were included in pre-test and post-test. The first meeting was about profession followed by problem-based learning; the second meeting was about educational background followed by problem-based learning. The third meeting was about curriculum vitae followed by problem-based learning. The fourth was about future plan followed by problem-based learning.

In the end of every session of teaching-learning, teacher assessed the preparation and its process of teaching-learning. It is needed to know whether or not students will be ready to the next steps of this research that is post-test.

3.3.1 Administering Try out-test

Try out-test was employed to reveal whether or not pre-test and post-test appropriate for experimental and control group to carry out. In this research, try out test was employed in terms of the same level of speaking ability as experimental and control group. Try out test sample was

the students from different class namely XI Pemasaran 1. There were twenty five students of XI Pemasaran 1. They have been chosen randomly as the sample of the try out test.

Speaking test was the instrument for the study. There were twenty students were asked to present a monologue orally based on the following instructions; students were given a certain problem to solve then they presented it to the teacher by using three instructions, first one was, identified the problem, second one was, figured out the solution and the last one was, elaborated the reason of the solution end possible consequences. In addition, four criteria were assessed in this test; they are grammar, vocabulary, comprehension and fluency.

3.3.2 Pre –test

Pre- test was employed to both groups as the first step of the research. This test was purposed to obtain the data of the students' basic speaking skill and to ascertain that the students from both groups had the same capability and the same English proficiency before they received the treatment. The procedure of test was exactly same with try out test.

3.3.3 Conducting Treatment

This research was conducted to see the effect of the two groups namely experimental and control group with different treatment. The experimental group was taught by using problem-based learning as treatment, while the control group was given non treatment.

Treatments were applied in the experimental group through series of teaching-learning process. Materials which have been taught include profession, educational background, curriculum vitae and future plan concern with certain problem. Treatment schedule will be presented as follow:

No	Experimental Group		Control Group	
	Date	**Material**	**Date**	**Material**
1	October 6th, 2010	Pretest	October 6th, 2010	Pretest
2	October 26th, 2010	Describing profession/job followed by solving a problem concerns with profession.	October 26th, 2010	Describing profession/job using problem solving
3	October 27th, 2010	Educational background followed by solving a problem concerns with educational background.	October 27th, 2010	Educational background using problem solving
4	October 28th, 2010	Curriculum vitae followed by solving a problem concerns with curriculum vitae	October 28rd, 2010	Curriculum vitae using problem solving
5	October 29th, 2010	Future plan followed by solving a problem concern with future plan	October 29th, 2010	Future plan using problem solving

6	November 1st,2010	Post test	November 1th, 2010	Post test

3.1

Time Schedule of Research

3.3.4 Administering Post-test

The study employed the post test at the end of the research. It was used to measure the students' speaking skill after the treatments. It was employed to both experimental and control groups. This was intended and also to find out the differences between students' score of both group. The posttest was almost similar to the try out test.

3.4 Administering Questionnaire

After conducting Pre-test and post-test, Questionnaire was distributed to reveal the students' attitude toward the use and the advantages of problem-based. Questionnaire is 'a set of questions for obtaining statistically useful or personal information from individuals' (Meriam-Webster Online Dictionary: 2008). In this study, the researcher administered close-ended questioner. This instrument provides students' point of view about treatment that they had got as description of additional information concerning with Problem-based learning.

In completing the close-ended questionnaires, each student should choose one of the options given (strongly agree, agree, disagree, strongly disagree and doubt) in responding to each statement. The options have the following scale.

Category of Response	Strongly Agree	Agree	Disagree	Strongly Disagree	Doubt

Table. 3.2 Scores of Questionnaire Response

This form of questionnaire consists of 14 positive statements with the framework as follow:

No	Aspects	Item Number	Total
1.	Response to the implementation of Problem-based learning.	1 and 2	2
2.	Response to the importance of learning English using Problem-based learning.	3, 4, 5, 6, 7, 8, 9 and 10	8
3.	Response to the lesson content given in learning English using Problem-based learning.	11 and 12	2
4.	Response to the role of the teacher in teaching and learning English using Problem-based learning.	13, 14, and 15	3
Total			**15**

Table. 3.3 The frame of the questionnaires for the students

3.5 Data Analysis

After collecting the data by using the instruments, the researcher analyzed it. The process of the data analysis was done on the pretest and post-test scores to find out the students development by problem-based learning after the treatments. There were scores and criteria which were settled to give brief explanation for every score given in assessing student's speaking ability. Criteria of assessment in conducting pretest and posttest were settled by the scoring guide based on ''Testing for language Teacher'' Hughes Arthur (1989). They are grammar, vocabulary, comprehension and fluency.

3.5.1 Data Analysis of Try-out test

Result of students' speaking test on try out was calculated using computer program named SPSS (Statistical Package for the Social Science) version 16. This program was useful in measuring in term of parametric test namely the data was homogeneity and normality.

3.5.2 Data Analysis on Pre-test

The pre-test scores from the students' speaking were analyzed statistically by using SPSS 16. The calculation covers normality distribution, homogeneity variance, and t-test. In detail, the data analysis is presented as follow. Firstly, analyze the normality distribution. According to Hatch and Farhdy (1982) the normal distribution has three distinct properties that allow us to make inferences about the population in general and our sample of that population in particular.

The statistical calculation of normality test used Kolmogorov-Smirnov by following three steps below:

1) Setting the level of significance (*p*) at 0.05 and establishing the hypotheses as follows:

   H_o: the variances of experimental and control group are normally distributed.

2) Analyzing the normality distribution with Kolmogorov-Smirnov test.

3) Comparing the asymp.sig with the level of significance (*p*) to test the hypothesis. If the asymp.sig > 0.05, the null hypothesis is not rejected and alternative hypothesis is rejected, and the distribution of data is normal. Hence, if the asymp.sig < 0.05, the null hypothesis is rejected and alternative hypothesis is not rejected, and it means the data is not normally distributed.

Secondly, calculate homogeneity variance. The homogeneity of variance test used a SPSS program namely Levene test. The steps are as follows:

1) Setting the level of significance (*p*) at 0.05 and establishing the null hypotheses as follows:

   H_o: the variances of the experimental and the control group are homogenous.

2) Analyzing the homogeneity of variance by using Levene test.

3) Comparing the asymp.sig with the level of significance to test the hypothesis. If the asymp.sig $>$ 0.05, the null hypothesis is not rejected and alternative hypothesis is rejected. It suggests that the variances of data are homogenous. However, if the asymp.sig $\leq$ 0.05, the null hypothesis is rejected and alternative hypothesis is not rejected. It clarifies that the variances are significantly different.

After revealing the result of normality and homogeneity test, the next statistical computation namely independent t-test was conducted. Those were the procedures to follow in calculating the independent t-test of pre-test and post-test data:

1) Setting the level of significance (*p*) at 0.05 and establishing the null hypothesis for the pre-test and post-test data analysis. The null hypothesis is stated as bellow:

H_o: there is no significant difference between the means in experimental and control group.

2) Analyzing the independent t-test by using SPSS 16.0.

3) Comparing the t *obt* and t *crit* at $p = 0.05$ and $df = 48$ to examine the hypothesis. If the t *obt* > t *crit*, the null hypothesis is rejected and alternative hypothesis is not rejected. It clarifies that there is difference of means between experimental and control group. However, if the t *obt* < t *crit*, the null hypothesis is not rejected and alternative hypothesis is rejected. It declares that there is no difference of means between experimental and control group.

3.5.3 Data Analysis on Post-test

Data analysis on post-test employed exactly the same steps as in the pre-test data analysis which is included normality test, homogeneity test, and independent t-test by using SPSS 16 for window.

3.6 The Calculation of Effect Size

According to Coollide (2001: 151) effect size is the effect of the influence of independent variable upon the dependent variable. It means that effect size is a way to consider how well the treatment works. If there is a large different between the two groups' means, it states that the treatment really works, and then there is said to be a much effect size. If the difference between the two groups' means is small, then there is said to be a small effect size.

$$r = \sqrt{\frac{t^2}{t^2 + df}}$$

Notes:

r = Effect size

t = t obt or t value from the calculation of independent t-test

df = N1 + N2 – 2

After gaining the effect size, then the score will be matched with the following scale to interpret the effect size.

Effect Size Value

Effect Size	r value
Small	.100
Medium	.243
Large	.371

Table 3.6 (Coolidge, 2000: 151)