

CHAPTER III

RESEARCH METHODOLOGY

This chapter comprises of the research design and variables; population and sample; hypothesis; research instruments; data collection procedures, and data analysis of the tests.

3.1 Research Method

In this research, the experimental research design was used to find out the influence of the certain treatment in the controlled condition (Sugiyono, 2008:107). Because this method is a part of the quantitative method, there would be some statistic computation in order to analyze the data of the research.

3.1.1 Research Design

There are various types of experimental design; however, the one group pretest-posttest of pre-experimental design was used in this research (Arikunto, 2008:78). This kind of design tries to compare the condition of students before and after the treatments through the pre- and post-test results. As proposed by Arikunto (2008:78) the scheme of the design is as follow:

Group	Pretest	Treatment	Posttest
A	O1	X	O2

O1 = Observation of pretest score result before treatment

O2 = Observation of posttest score result after treatment

Furthermore, Sukmadinata (2007:59) stated that a single subject experimental design is the type of research designs that only uses one experimental subject (or sample). Thus, there is no control variable and random sample in the experiment (Sugiyono, 2008:109).

3.1.2 Research Variables

As Nunan (1992:25) said that, “a variable...is anything which does not remain constant.” In addition, Kerlinger (1973) in Sugiyono (2008:61) stated that “*variable adalah konstrak atau sifat yang akan dipelajari...yang diambil dari suatu nilai yang berbeda*”. It means that the variable is the variation. Moreover, Kidder (1981) in Sugiyono (2008:61) gave definition that the quality or value of people, object, and activity which has certain variety in order to be learnt and generalized can be also called as a variable.

In fact, there are two measured variables in this research. They are song treatment as the independent variable and the students’ vocabulary achievement which can be seen from the test result as the dependent variable.

3.2 Subject of Research

3.2.1 Population

Arikunto (2002:108) described population as the whole subject in the research field. Based on that definition, the population of this research is all the 4th grade students in SD Negeri Sukamenak Indah 1, 2, 3 and 5 which are located in Perumahan Sukamenak Indah O no. 27, Bandung.

3.2.2 Sample

According to Sugiyono (2008:118), the sample is the representative part of the population. In this research, 22 students of the 4th grade in SD Negeri Sukamenak Indah 1 were taken as the sample. The ages of the students are around 9-10 years old.

The reason for choosing the students of the 4th grade in this research was because they had learned Basic English on the stage before. Besides, based on the preliminary survey conducted before the treatments, it could be observed that the English vocabularies of the 4th grade students in SDN Sukamenak Indah were still taught by using the traditional method, which was the repetition of words. Considering that situation, the writer tried to implement a better way in teaching English vocabularies to the 4th grade students in SD Negeri Sukamenak Indah 1 by using the song.

Moreover, the sample in this research was selected through the purposive sampling. It was based on the certain purpose in order to get the maximum data considering the limited time, fund, and energy (Arikunto, 2002:117).

3.3 Hypothesis

Sugiyono (2008:224) defined hypothesis as, "...the tentative answer to the formula of the problem." Moreover, he said hypothesis is the theoretical answer to the research problem (Sugiyono, 2008:96). Because this research used the quantitative method, the hypothesis must be formulated.

In this research, the null hypothesis would be tested. Emory (1985) in Sugiyono (2008:224) said, “The null hypothesis is used for testing. It states that no difference exists between the parameter and statistic being compared.”

Therefore, the formulation of the null hypothesis for this research is stated in the following statement,

“There was no significant difference of students’ vocabulary mastery before and after the song treatments”

And, the null hypothesis is as follows:

$$H_0: \mu_{\text{pretest}} = \mu_{\text{posttest}}$$

It means that the song treatments have no influence in the students’ achievement in vocabulary mastery.

3.4 Research Instruments

In his book, Sugiyono (2008:133) stated that research instrument is a measurement tool of research. It is used to collect the data and to measure the value of the research variables in the research that uses the quantitative method. The research instruments in this research are the try-out test, songs, pre- and post-tests.

3.4.1 Try Out Test

Try out test is important in order to find out the validity and the reliability of the test before collecting the data of research. In fact, it was difficult to find the standardized vocabulary test in this research. Therefore, the new test referring to

the measured research variables was designed and made by the researcher. The type of the test is in the multiple choice form which contains four options and the matching test form. The example of the try out item is as follows.

1. I can see with my....
 - a. eyes
 - b. ears
 - c. hair
 - d. teeth



The try out test which consists of 40 items was conducted on 2nd of February 2009 to 20 of the 4th grade students in the SD Negeri Sukamenak Indah 3, Bandung.

3.4.2 Pre-test and Post-test

The purpose of giving the pre- and post-test is to find out the difference of students' achievement in vocabulary mastery before and after the song treatments were given. In this study, the pre-test and the post-test were actually in the same form of multiple choices which consists of four vocabulary options. Both of the tests contain 13 items of the valid try out test items that have been measured before.

3.4.3 Treatment

The song treatment instruments in this research were four songs with using some appropriate teaching aids (such as gestures, action-imitation, pictures, and exercises) to learn the simple noun vocabularies. The "My Face" song was taken from the "Grow with English 4" book. Moreover, "Face", "Human Body" and "My Clothes" songs were specially composed by the writer for the students.

The treatments were held in four instructional processes which were lasted for 70 minutes per meeting. The lesson plans were also made based on the School Based Curriculum or *Kurikulum Tingkat Satuan Pendidikan (KTSP)*; and *Standar Kompetensi Dasar (SK-KD)* or Standard and the Basic Competency Concepts. The following table is the outline of the lesson plans.

Table 3.1
Lesson Plans

Treat-ments	Pre- Activities	Main Activities	Post- Activities	Vocabulary Focus
1	Brainstorming parts of face	Sing the “ My Face” and “Face” songs	Play “My Face” games	eyes, ears, nose, mouth, lips, chin, cheek, teeth, hair, mouth, tongue
2	Brainstorming parts of body	Sing the “Human Body” song	Play “Parts of Body” games	Head, shoulder, chest, hip, knee, foot, back, arm, finger, elbow, hand
3	Brainstorming clothing	Sing the “My Clothes” song	Do “Clothes” exercise	Shirt, shorts, skirt, dress, cap, tie, socks, shoes
4	Review all vocabulary lessons	Sing all the songs	Do the parts of face, human body, and clothes vocabularies exercises	All vocabularies (parts of face, human body, and clothes)

3.5 Data Collection Procedures

The data of the research were gathered and collected through some significant steps. First, the try out test referring to the material from English for grade 4 school books that consists of 40 items were made. Further, the try out test

was conducted on 2nd February 2009 in the SD Negeri Sukamenak Indah 3. There were 20 of the 4th grade students who did the try out test at that time.

After conducting the try out test, the writer did the calculation of the difficulty power, discriminating power, validity, and reliability in order to find out the valid items for pre-and post tests. From 40 items of try out test, there were only 13 valid items for the pre-and post-tests.

Further, the pre-and post tests were respectively administered on 6th February 2009 and 13th March 2009 in order to gain the raw data of the research. In brief, the time allocation of the research schedule is shown in the following table:

**Table 3.2
Research Agenda**

Stages	Date	Events
1.	15 th January 2009	Asking permission to the headmaster of SDN Sukamenak Indah 1 and survey for conducting the research treatments
2.	27 th January 2009	Asking permission to the headmaster of SDN Sukamenak Indah 3 and survey for conducting the try out test
3.	2 nd February 2009	Try out test
4.	6 th February 2009	Pre-test
5.	13 th February 2009	Treatment 1
6.	20 th February 2009	Treatment 2
7.	27 th February 2009	Treatment 3
8.	6 th March 2009	Treatment 4
9.	13 th March 2009	Post-test

3.6 Data Analysis

3.6.1 Analyzing Data of Try Out Test

3.6.1.1 Difficulty Index

Arikunto (2008:207) stated that difficulty index is an assumption that a good item should not be too difficult or too easy. The formula is as follows:

$$P = \frac{B}{JS}$$

P = Difficulty index
B = Number of subjects who answer the item correctly
JS= Number of all subjects

Table 3.3
Criteria of Difficulty Index

Difficulty Index	Interpretation
0.00 – 0.30	Difficult
0.30 – 0.70	Moderate
0.70 – 1.00	Easy

(Arikunto, 2008:210)

For example:

Item no 8.

$$P = \frac{B}{JS} = \frac{6}{20} = 0.3$$

Based on the computation above, the difficulty level of item no. 8 is 0.3.

Based on the Arikunto's categorization, this item can be classified as the difficult item.

The rest of the items that were calculated by using the same formula would be presented on the Appendix 1. From the calculation of 40 tested try out test items, 6 items are difficult, 25 items are moderate and 9 items are easy.

3.6.1.2 Discriminating Power

Arikunto (2008:211) said that a good item must be able to differentiate the higher achiever from the lower achiever students as well. It deals with the discriminating power that has the following formula:

$$D = \frac{BA - BB}{\frac{1}{2}JS}$$

- D = Discrimination Index
- BA = Number of right answer from upper group
- BB = Number of right answer from lower group
- JS = Number of all subjects

Table 3.4
Criteria of Discrimination Index

Discrimination Index	Interpretation
0.00 – 0.20	Poor
0.20 – 0.40	Satisfactory
0.40 – 0.70	Good
0.70 – 1.00	Excellent

(Arikunto, 2008:218)

For example:

Item no. 8

$$D = \frac{BA - BB}{\frac{1}{2}JS} = \frac{3 - 3}{10} = 0$$

The computation above shows that the discrimination index of item no. 8 is 0. Based on the criteria of discrimination index, this item is poor in differentiating the high and low achiever between students.

The rest of the items that were calculated by using the same formula would be presented on the Appendix 1. Out of 40 tested try out test items, 20 items are poor, 8 items are satisfactory, 10 items are good, and 2 items are thrown away.

3.6.1.3 Validity

A good test instrument must be valid. According to Sugiyono (2008:173), valid means that the instrument can be used to measure what should be measured. It copes with the persistency.

In this study, the Pearson Product Moment Formula was used in calculating the validity of coefficient correlation of each test item. The formula is as follows:

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

r_{XY} = coefficient correlation between x and y

N = the number of subjects (or samples)

$\sum X$ = the sum of score of each test item

$\sum Y$ = the sum of score of all test items

$\sum XY$ = the sum of the XY cross products

$\sum X^2$ = the sum of the squared X scores

$\sum Y^2$ = the sum of the squared Y scores

Table 3.5
Category of Coefficient Correlation of Validity

r value	Interpretation
0.80 – 1.00	Very high
0.60 – 0.80	High
0.40 – 0.60	Satisfactory
0.20 – 0.40	Low
0.00 – 0.20	Very low

(Arikunto, 2008:75)

After calculating the validity of each try out test item by using the formula above, the result reveals that 13 items are valid. It means that those items can be used in the pre-and post tests. The complete data can be seen on Appendix 1.

3.6.1.4 Reliability

A good test instrument must also be reliable. It means that the instrument will produce the same data if it is used to measure the same object (Sugiyono, 2008:174). Reliability deals with the consistency and stability.

Moreover, Sugiyono (2008:174) said that since reliability is an important thing in testing the validity of the instrument, the reliability testing of the instrument must be employed. Some steps in calculating the reliability of the test are as follows.

- 1) Dividing the test item numbers into halves of the odd (X) and the even (Y) numbers,

- 2) Calculating the correlation coefficient of the half-reliability of the test by using Pearson Product Moment Formula,

$$r_{\frac{1}{2}\frac{1}{2}} = \frac{N \sum XY - (\sum X)(\sum Y)}{\sqrt{\{N \sum X^2 - (\sum X)^2\} \{N \sum Y^2 - (\sum Y)^2\}}}$$

The computation on the half-part reliability of the try out test is as follows:

$$r_{\frac{1}{2}\frac{1}{2}} = \frac{(20)(2461) - (203)(223)}{\sqrt{\{20(2341) - 41209\} \{(20)(2667) - 49729\}}}$$

$$r_{\frac{1}{2}\frac{1}{2}} = \frac{49220 - 45269}{\sqrt{\{46820 - 41209\} \{53340 - 49729\}}}$$

$$r_{\frac{1}{2}\frac{1}{2}} = \frac{3951}{\sqrt{\{5611\} \{3611\}}} = \frac{3951}{\sqrt{20261321}}$$

$$r_{\frac{1}{2}\frac{1}{2}} = \frac{3951}{4501.26} = 0.88$$

- 3) Finding out the reliability of the whole test by using The Spearman-Brown Formula as follow:

$$r_{XY} = \frac{2(r_{\frac{1}{2}\frac{1}{2}})}{1 + r_{\frac{1}{2}\frac{1}{2}}}$$

The computation of the reliability of whole test as follow:

$$r_{XY} = \frac{(2)(0.88)}{1 + 0.88} = \frac{1.76}{1.88} = \mathbf{0.94}$$

- 4) Interpreting the result of the coefficient correlation by using this following categorization table.

Table 3.6
Category of Coefficient Correlation of Reliability

Coefficient Correlation	Interpretation
0.00 – 0.20	Low
0.21 – 0.40	Moderate
0.41 – 0.70	High
Above 0.70	Very High

(Arikunto in Purbasari, 2009:34)

Based on the computation above, the result shows that the coefficient correlation of the test is 0.94. It means that the tested items are considered to have a very high reliability for the subject of research. The complete data can be seen on Appendix 1.

3.6.2 Analyzing Data of Pre-and Post-tests

The result of the pre-and post-tests data would be analyzed by using the dependent paired samples t-test formula in order to compare the significant mean difference between the two tests. The t-test result of pre-and post-tests would also be significantly used to answer the proposed hypothesis and the research question.

There were some procedures in analyzing the pre-and post-tests data. Firstly, the results of the pre-and post-test scores were calculated by using “without punishment formula” proposed by Arikunto (2008:172). The formula is as follows.

$$S = R$$

S= Obtained score (Raw Score)
R= the right answer

Then, the raw data scores were transformed into scale 1-100. Secondly, the data of pre-and post tests were categorized by using Harris' categorization.

Thirdly, the pre-test and post test data were statistically analyzed by using the paired-sample t-test on SPSS 12 for Windows Program with the level of significance (p) = 0.05 and the t critical with $df = N-1$. Finally, the writer determined whether the null hypothesis should be rejected or retained by comparing the obtained t with the critical t (If $t_{obt} \geq t_{crit}$, H_0 can be rejected but if $t_{obt} < t_{crit}$, H_0 cannot be rejected).

