CHAPTER III
RESEARCH METHODOLOGY

A. Method of the Research

Research is term to investigate a problem systematically, critics, science, formally and generally to find, improve, or examine the true knowledge, which have descriptive, and or prediction ability. It is also an activity by using logical thinking explicitly back, for the research or the other.

Arikunto (2002) says that research is an activity to pay close attention an object, by using a special role to get information, which is useful. Research intends to invent, improve, or examine the truth of a knowledge, which has description and or prediction ability.

In this research the researcher wants to found out the effectiveness song to increase students’ vocabulary. So the researcher uses the method that is called “Experiment”. Consuelo (1993:106) support it that experiment is used to find out the effect of treatment. This method is used to learn the comparison between the experimental class, with gots treatment and control class which does not got treatment.

According to Suwartono (2007:58) there are three kinds of experimental method, they are as follows:

1) Pre-Experimental design

2) Quasi experimental design
3) True experimental design

This research belong to the quasi experiment, because it is done based on the quasi experiment requirement. There is a control class without treatment, which is used to compare the experiment class with treatment and before the experiment is done, the condition of two classes or almost the same.

B. Place and Time of Research

1. Place of Research

The research was done at SMP Negeri 2 Watukumpul in academic year 2014-2015

2. Time of Research

The observation through survey and tests was held from 1\textsuperscript{th} to 17\textsuperscript{th} June 2015

C. Subject of the Study

1. Population

Population is a set or correlation of all elements possessing one or more attributes interest (Arikunto, 2010:173). In addition, Hadi (1987:220) says that population is a total number of group consisting of subjects which have homogenous characteristic or features. Population was seventh grade of SMP N 2 Watukumpul in the academic year 2014/2015 there were 180 students of 6 classes and each consist of 30 students.
2. Sample

Sample is part of the population being studied when the subject of the research is less than a hundred, all of them should be taken as sample. Then if the number of the subject is more than hundred, the researcher can take the subject as sample between 10-15% or 20-25% more depends on the time, energy, fund and large of research area but it is better if the sample taken is bigger (Arikunto, 2010:177)

3. Sampling Technique

Gay (1987:101) says that sampling is the process of selecting a number of individuals for a study in such way that the individual represent the larger group from which they were selected. Sampling technique is a way that is used to take sample of the population that researcher can make generalization of the sample and sample must be able to represent of the population.

In this research the researcher took class 7d and 7f in the population as sample. The researcher divide into two groups. The first group is an experiment class which is given treatment where a teaching process conducted by using songs as media and the second group is a control class where teaching learning by using drilling and the result is compared to the experiment class which has the following considerations:
a. Both groups are taught by the same teacher

b. Both of groups have the same number of students

D. Technique of Collecting Data

a. Test

The technique that was used to collect the data is objective test, the researcher used two kinds of test, and they were:

1. Pre-test

   It was for the experimental and control group. This test was given before the group was given treatment. The test was multiple-choice question. The vocabularies tested were in the form of nouns. Their totals are 25 item.

2. Post-test

   Post-test was used to measure the effect of certain treatment. This test was given after the experimental groups was given treatment, and the instrument of test was an objective test. The reason why researcher chose an objective test is that an objective test is suitable for vocabulary test. Besides, an objective test can be corrected objectively. In correcting, it is easier and faster because there was the key answer of test.

\[
\text{score} = \frac{\sum \text{right answer}}{\sum \text{number of item}} \times 100
\]
E. The technique of Instrument Analysis

It is used to know the validity and the item difficulty of the instrument before used in the research.

1) Validity

Validity is a measurement that indicated the level of validity of an instrument; an instrument is valid if it can measure what it is intended to measure. The researcher measured the validity by the formula is as follow:

\[
r_{xy} = \frac{N \sum xy - (\sum x)(\sum y)}{\sqrt{(N \sum x^2 - (\sum x)^2)(N \sum y^2 - (\sum y)^2)}}
\]

(Arikunto, 2010:213)

Where:

\(r_{xy}\) : Validity of test

\(N\) : The total number of respondents.
\( \Sigma x \): the sum of score of distribution x (compute the total number of students who answer correctly in one question)

\( \Sigma y \): the sum of score of distribution y (compute the total number of all correct answer and all of student)

\( \Sigma x^2 \): the sum of square of distribution x

\( \Sigma y^2 \): the sum of square of distribution y (square the correct answer of students and by one, than total them)

\( \Sigma xy \): the sum of multiplication between distribution x and distribution y (the multiplication between the score of students and total score of students)

Then the result is classified into the validity grade of test items as follows:

Criterion:

\(0.81 < r_{xy} \leq 1.00\) = very high

\(0.61 < r_{xy} \leq 0.80\) = fair

\(0.21 < r_{xy} \leq 0.40\) = low

\(r_{xy} \leq 0.00\) = not valid

2) Reliability

Reliability is an important characteristic of a good test, if the test is administrated or given to the same student in different occasion and the result is consistent, it shows that the test or intrumenr is reliable.

The formula bof reliability is:
Where:

\[ r_{11} = \left( \frac{k}{k-1} \right) \left( \frac{V_t - \sum pq}{V_t} \right) \]

Where:

- \( r_{11} \) = reliability
- \( k \) = the total item
- \( V_t \) = total variant
- \( P \) = proportion of subject who answer the question with the correct item (the proposition of subject who have score 1)
- \( q \) = proposition of subject who gets score of 0 (\( q = 1 - P \))
- \( \sum pq \) = the sum of multiplication between the population of the students who answered correctly and the proportion of the students who had wrong answer.

(arihunto, 2010:231)

This study used some steps as follows:

a) Determining the total varian (\( V_t \))

The formula of total variant as follows:

\[ V_t = \frac{\sum y^2 \cdot (\sum y)^2}{N} \]

Where

- \( V_t \) = the variant of total score
- \( \sum y \) = the sum of students’ total score
- \( \sum y^2 \) = the sum square of students’ total score
- \( N \) = number of students
According to Arikunto, the criterion of instruments’ reliability can be classified as follow:

\[ r_{11} \leq 0.02 \quad : \text{lowest reliability} \]
\[ 0.20 \leq r_{11} \leq 0.40 \quad : \text{low} \]
\[ 0.40 \leq r_{11} \leq 0.60 \quad : \text{enough} \]
\[ 0.60 \leq r_{11} \leq 0.80 \quad : \text{high} \]
\[ 0.80 \leq r_{11} \leq 1.00 \quad : \text{highest} \]

b) calculating \( \sum pq \)

in calculating \( \sum pq \) here some steps

1. Determining \( p \)

\[ p = \frac{\sum \text{correct answer}}{\text{number of respondent}} \]

2. Determining \( Q \)

\[ Q = 1 - p \]

3. Multiplying between \( p \) and \( q \)

c) entering formula

After finding \( \sum pq \), \( V_t \) and \( k \) then enter it to formula. After knowing the result then writer consult the \( r \) table. If the \( r \) counted is higher than the \( r \) table, it means that test is reliable. Result of validity and reliability can be seen in appendix
3) Item difficulty

Item difficulty shows how easy or difficult the particular item probed in the test. It is calculated by using formula as follows:

\[ FV = \frac{R}{N} \]

Where:

FV : Item difficulty
R   : The number of correct answers
N   : The number of students taking the test

The complete result of the item difficulty as follows:

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Level</th>
<th>Number of item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficult</td>
<td>0.00 – 0.30</td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>0.31 – 0.70</td>
<td></td>
</tr>
<tr>
<td>Easy</td>
<td>0.71 – 1.00</td>
<td></td>
</tr>
</tbody>
</table>

F. Data analysis

After data had been collected, they are ready to be analyzed. In analyzing the data, the researcher used the following steps:

1. Percentages score
   a. Determining the individual vocabulary mastery, the formula is as follows:

\[ P = \frac{F}{N} \times 100 \]
Where:

P : The percentage of the correct answer
F : The frequency of correct answer
N : The number os students

From the percentage of correct answer, it will be found the level of students’ ability in memorizing vocabulary using song.

In term of the percentages of the correct answer, Nurkancara (1983:80) suggest five categories of the students competence as follows:

<table>
<thead>
<tr>
<th>Percentages</th>
<th>Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>81 – 100</td>
<td>Very good</td>
</tr>
<tr>
<td>61 – 80</td>
<td>good</td>
</tr>
<tr>
<td>41 – 60</td>
<td>fair</td>
</tr>
<tr>
<td>21 – 40</td>
<td>bad</td>
</tr>
<tr>
<td>0 – 20</td>
<td>Very bad</td>
</tr>
</tbody>
</table>

b. Mean

Mean is used to find the average of the data distribution. This research esd the formula as follows:

1. Control group

\[ M_x = \frac{\sum x}{N} \]

2. Experiment group
\[ M_y = \frac{\sum y}{N} \]

(Arikunto, 2010:356)

Where:

Mx : Means of the score to control group

My : Means of the score to experiment group

\[ \sum X \] : Residual score of control group

\[ \sum Y \] : Residual score of experiment group

N : The number of the students

c. The sum of square deviation each group.

This research and the formula as follows:

Experiment class \[ \sum x^2 = \sum x^2 - \frac{(\sum x)^2}{N} \]

Control class \[ \sum y^2 = \sum y^2 = \frac{(\sum y)^2}{N} \]

(Arikunto, 2010: 335)

3. T-test

a. This research used the t-table formula as follows:

\[
t = \frac{M_y - M_x}{\sqrt{\frac{\sum x^2 + \sum y^2}{Nx + Ny - 2} \left\{ \frac{1}{Nx} + \frac{1}{Ny} \right\}}}
\]
Where:

Mx : Mean of the score to the control group

My : Mean of the score to the experiment group

Nx : The respondent number of the control group

Ny : The respondent number of the experiment group

\[ \sum x^2 \]: Sum of squared derivations of control group

\[ \sum y^2 \]: Sum of squared derivations of experiment group

b. Finding degree of freedom (d.f) as follows:

\[ d.f = (N_x + N_y - 2) \]

(Arikunto, 2010:356)