Chapter Three Research Methodology

This chapter elaborates the discussion on the research design and variable, research procedure, the instrument used in the research, how the data were collected and the way the data were analyzed.

3.1 Research Design and Variable

In the research, the writer gave certain treatment only to the experimental group that become the independent variable and observed the changes of the conditions or behaviors that took place as the dependent variable. As Nunan states that, "a variable, as the term itself suggests, is anything which does not remain constant. In our case, it includes language proficiency, aptitude, motivation, and so on". (1992:25)

Furthermore, Nunan (1992:25) states that the variable which the experimenter expects to influence the other is called the *independent variable,* in this case this would be the teaching method (using songs' method) while the variable upon which the independent variable is acting is called the *dependent variable* or the test scores. Nunan shows the major difference of Quasi-experimental design compare to the Pre-experimental and True experimental design in the following table:

Table 3.1
Contrasting Pre-experiments, Quasi-experiments, True experiments (Nunan, 1992: 41)

Type	*Characteristics*
Pre-experiment	May have pre- and post treatment tests, but lacks a control group
Quasi-experiment	Has both pre- and posttests and experimental and control groups, but no random assignment of subjects
True experiment	Has both pre- and posttests, experimental and control groups, and random assignment of subjects

As the title indicates, this research was True Experimental Design. Experimental design was also known as longitudinal or repeated-measures studies, for obvious reasons. It also referred to as interventions, because you do more than just observe the subjects (Hopkins, 1998: online). This research design relies less on interview, observation, small numbers of questioners, focus group but it was much more focused on the collection and analysis of numerical data and statistic (Hopkins, 1998). As Decker (1997) states that there are four experiments involve on True experimental design 1) treatment, 2) outcome, 3) units of assignment and 4) comparison from which change can be inferred and attributed to the treatment.

According to Hatch and Farhady (1982:22), there are three basic characteristics of true experimental design:1) A control group (or groups) is present; 2)The student are randomly selected and assigned to the groups; 3) A pre-test is administered to capture initial differences between the groups. There are two common true experimental designs: 1) Post-test only controls group and 2) Pre-test posttest controls group.

This research will concern in pretest posttest control design. The pretest will be conducted to find out the basic skill of the students.

Table 3.2
The Treatment Design

Group	Pre-test	Treatment	Post-test
Experimental	Test A	Using songs	Test B
Control	Test A	-	Test B

According to Hatch and Farhady (1983), the formula of pre-test post-test control group design was:

G_1 (random) T_1 x T_2

G_2 (random) T_1 T_2

Note:

G_1 = *Experimental Group*
G_2 = *Control Group*
T_1 = *Pretest*
T_2 = *Posttest*
x = *Treatment*

This subject of this research will be divided into two groups, The Experimental group and the Control group. Both groups will be given pretest and posttest. However, only the experimental group will receive treatment.

3.2 Setting

This research was held in SMK Negeri 9 Bandung which is located at JL. Soekarno-Hatta km10 Bandung

3.3 Population and Sample

3.3.1 Population

Arikunto (1998;115) defines population as the whole subject in the research field. From that definition, this research will take the students of second grade of vocational school students of SMK Negeri 9 Bandung as the Population. The population of this research was the 210 second grade students. The choice of

Population was based on the consideration that the second grade students had already learnt about simple present and simple past tense.

3.3.2 Sample

Arikunto (1998:117), states that the sample was the half or representative of the population which was researched. Since there were 210 students in the second grade at SMKN 9 Bandung, two classes (71 students) were taken as the sample of this research. These two classes were divided into control group and experimental group. XI Busana 2 as the experimental group which was given several treatments, while XI Busana 1 as the control group which was not given any treatment. However, due to the reason that some students were absent when the pretest was conducted, the researcher decided to take only 30 students from each class as the sample. So the fixed number of the sample was 60 students.

3.4 Instruments

To obtain the data related to the research problem, the writer used some instruments, those were:

3.4.1 Instrument for the Treatment

The instruments used in this research were in the form of MP3 player, speaker, songs, and exercises. The exercises were designed for the control group and experimental groups, while MP3 and songs' lyrics were designed for experimental group only. The songs which were used in this research were *You're beautiful* by James Blunt, *Butterfly* by Weezer, *Because You Loved Me* by Celine Dion, *Everytime* by Britney Spears,

Bizarre Love triangle by Frente, and *My Heart Will Go On* by Celine Dion which were taken from www.letsingit.com . The writer chose the songs because all those songs were appropriate for teaching simple past and simple present and generally the songs were clear and loud, as Lems (2001: online) recommends Song should be clear and loud.

3.4.2 Pre-test and Post-test Instrument

The writer used the same pre-test and post-test instrument for both control and experimental groups. The pre-test instrument was exactly the same as the post-test instrument. The pre-test and post-test instrument used in this research was in the form of Gap filling which was taken from the English sites on the internet.

3.4.3 Questionnaire

The Questionnaire sheets are given to experimental class to figure out the responses of the students to the use of songs in teaching simple past and simple present.

3.4.4 Interview

The interview was given to the experimental group to get further explanation related to the students' answer in the questionnaire sheets. Besides, the interview tried to figure out the students' perceptions and obstacles faced in using songs.

3.5 Data Collection

3.5.1 Try Out of the Instrument

The try-out of the instrument was conducted on 20th April 2007. It was held in class 2 Restoran 1 of that school the try-out was administered to find out the validity and reliability of the instrument used for pre-test and post-test. From the validity and reliability of the instrument, the writer took 25 items of 50 for the pre-test and post-test.

3.5.2 Pre-test

Hatch and Farhady (1983:22) state that "a pre test is administered to capture the initial differences between the groups". It was clear that pre-test is used to find the initial differences between the groups that have similar level.

Before conducting the research, a pre-test was administered for both control and experimental groups on 23rd April 2007. The form of the test was gap filling. There are 25 items, 10 items related to simple present tense and 15 items related to simple past tense. Time allocate for administering the test was 30 minutes.

3.5.3 Treatment

The treatment implemented in this research was giving songs in teaching simple past and simple present tense. The treatments were conducted from 27th April to 28th May 2007. The treatment applied for the experimental group was teaching grammar, simple present and simple past tense. In this class the writer tried to make the students relax and enjoy but serious.

3.5.4 Post-test

The post-test had the same procedures with those of the pre-test. It was employed in the last program of this research after giving some treatments and exercises to the experimental group in a period of time. The post test was conducted on 4th June 2007.

3.5.5. Questionnaire

The Questionnaire was given to the experimental group after the post-test was held. It was on 18th July 2007.

3.5.6 Interview

The interview was given to the experimental group to get further explanation related to the students' answer in the questionnaire sheets. It was on 26th July 2007.

3.6 Data Analysis

3.6.1 Validity and Reliability of Try Out

3.6.1.1 Validity

Hatch and Farhady states that validity refers to the extent to which the results of the procedure serve the uses for which they were intended. Validity refers to the results of the test not to the test itself. Also validity is a matter of degree. It is not an all-or-nothing trait. We talk about high validity, moderate validity, and low validity rather than absolute validity (1982: 251).

Arikunto (1998:160) states "*validitas adalah suatu ukuran yang menunjukkan tingkat-tingkat kevalidan atau kesahihan suatu intrumen*". In this research, the writer uses Pearson Product Moment to estimate the validity of the instrument as formulated below:

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

Where: rxy : Coefficient correlation between X and Y variable
N : The sum of samples

(Arikunto, 1998)

The result of the calculation was then interpreted based on the criteria for the test validity formulated by Arikunto (1998) as follow:

Table 3.3
The correlation coefficient of Product Moment Interpretation

correlation coefficient	Interpretation
0.800 – 1.000	Very High
0.600 – 0.800	High
0.400 – 0.600	Moderate
0.200 – 0.400	Low
0.000 – 0.200	Very Low

The test chosen is filling gap test consists of 50 items. The materials of the test have been adapted from sources on the internet.

	X	Y	X2	Y2	XY
total =	557	560	10899	11140	10875

Table 3.4 the validity of the tryout test

To measure the validity of the test, the data compute with the correlation of Pearson product moment formula to find out the degree of validity of the try-out test. From the calculation from the data in the table 3.4 in Microsoft Excel above shows that the result of validity of whole items is 0,772114, it shows that the test is categorized to have very high validity. From the 50 items which was given in the tryout, the writer also found out every item's validity with SPSS

computation with the correlation of Pearson product moment formula which due to the r Product Moment table to decide whether the item is valid or not.

According to the r table for validity testing for Pearson Product Moment of 30 samples is 0,361. It means that the item which had value higher that 0,361 is valid. The result from Excel Pearson Product Moment computation shows that there were 36 items which was valid. From the 30 items, the writer took 25 items to be tested as pretest and post test. The complete calculation of validity of the try-out instrument used in this research is elaborated in the Appendix

3.6.1.2 Reliability of the Instrument

Reliability can be defined as the extent to which a test produces consistent results when administered under similar conditions. Consistency of results is the basic concept of reliability of a test (Hatch and Farhady, 1983: 244).

The writer used Spearman Brown prophecy formula to determine the reliability of the full test as formulated below:

$$r_k = \frac{2r_1}{1+r_1}$$

Where: r_k = the reliability of the full test
r_1 = the correlation of product moment of the half test

(Sugiyono, 2002: 278)

With the criteria formulated by Triton (2006:248):

Score	Reliability
0.00 s.d. 0.20	Very Low
>0.20 s.d. 0.40	Low
>0.40 s.d. 0.60	Moderate
>0.60 s.d. 0.80	High
>0.80 s.d. 1.00	Very High

Table 3.5

The table criteria of Reliability

Based on the formula above, the reliability computation of the Try-out test can be seen in figure 3.1.

$$r_k = \frac{2r_1}{1+r_1} = \frac{2(0,772114)}{1+0,772114} = 0,871404$$

Fig 3.1 computation of reliability testing

From the result above, it can be conclude that the test were reliable because the reliability of the test is 0,871404 exceeded the very high category, more that 0,80. This is in accordance with Triton (2006:248), who classified the range 0,80-1,00 into the very high category.

3.6.2 Testing the Normal Distribution

According to Hatch and Farhady (1983:64) 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, they are: mean, median and mode in a normal distribution are all the same. The first property results in the second characteristic – the shape of the normal distribution is bell-shaped and symmetric. The normal distribution does not have a zero score; the tails never meet the straight line.

Examining the normality of data, the writer used the Statistic Product Service Solution (SPSS) version 12.00, with the null hypothesis (H_0) : score for the group is normally distributed and H_1 : score for the group is not normally distributed. If the observed probability (p)>0,05 then Ho is accepted and if the observed probability (p)<0,05 then Ho is rejected.

3.6.3 Analyzing the data of Pre-Test

At the beginning of the research, a pretest was administered to both the experimental and control group. The pretest is aimed to find out the initial equivalence between the two groups. The case II study which is the subset of the t-test was used to determine whether the experimental and the control groups were equivalent. As Hatch and Farhady (1982:111) states that Case II studies require a comparison of two means for two groups drawn from the population. Moreover, certain assumption ought to be met in order to use the t-test. The assumptions underlying the t-test are:

1. The subject is assigned to one (and only one) group in the experiment.
2. The scores on the independent variable are continuous and that there are only two levels to the variable (i.e. only two means).
3. The variance of the scores in the populations are equal, and the scores are normally distributed (Hatch and Farhady, 1982: 114).

In the calculation of the t-test, the steps are as follow:

1. Stating the hypothesis.
2. Null hypothesis ($Ho = \overline{X_e} : \overline{X_c}$) and the alternative hypothesis ($H_1 = \overline{X_e} > \overline{X_c}$). With (p) at 0,05 (one tailed).
3. Finding number of sample (N).
4. Finding the experimental group's mean ($\overline{X_e}$).
5. Finding the control group's mean (X_c).
6. Finding the standard deviation of the difference for each group. The formula of the standard deviation is:

$$S = \sqrt{\frac{\Sigma X^2}{N-1}} \qquad S = \sqrt{\frac{\Sigma(X-\overline{X})^2}{N-1}}$$

S= standard deviation X= score

$\overline{X}$ = mean N= number of sample

$\sum X^2$ = sum square of each individual deviation

7. calculating the standard error of differences between the means using the formula below:

$$S_{(\overline{X}_e - \overline{X}_c)} = \sqrt{\left(\frac{S_e}{\sqrt{N_e}}\right)^2 + \left(\frac{S_c}{\sqrt{N_c}}\right)^2}$$

$S_{(\overline{X}_e - \overline{X}_c)}$ = standard error of differences

S = standard deviation N = number of sample

8. Finding the t-value:

$$t_{obs} = \frac{\overline{X}_e - \overline{X}_c}{S_{(\overline{X}_e - \overline{X}_c)}}$$

9. determining the degree of freedom for t-critic:

df = N-1 N = number of sample

10. Finding the critical value for t in the table.

11. Computing t_{obs} and t_{crit} to accept or reject the null hypothesis: if the $t_{obs} < t_{crit}$, or if the degree of probability (p) <0.05, the null hypothesis is accepted, the two groups were homogenous. If the null hypothesis is rejected, then move to the alternative hypothesis to figure out which group is better. The result is then ready to be interpreted.

3.6.4 Analyzing the data of Post-Test

In analyzing the posttest data, the case II studies were also used. The steps taken in calculating the case II studies were the same as in the pretest.

3.6.5 Data Analysis on the Experimental and Control Group's Score

The pretest and the posttest scores of each group were analyzed by using the matched t-test to find out whether the difference of the two means scores is significant (Hatch and Farhady, 1982). The steps taken in the matched t-test is similar to the t-test. The steps are elaborated as follow:

1. Finding number of sample (N)
2. Finding mean $(\overline{X})$
3. Finding the difference (D)

   $D = X_2 - X_1$

   X_1 = pretest score X_2 = posttest score
4. Finding the standard deviation of the differences between means

$$S_D = \sqrt{\frac{\Sigma D^2 - \left(\frac{1}{N}\right)(\Sigma D)^2}{N-1}}$$

5. Finding the standard error of differences between means $\left(S_{\overline{D}}\right)$

$$S_{\overline{D}} = \frac{S_D}{\sqrt{N}}$$

6. Finding the t-value: $t = \dfrac{\overline{X}_1 - \overline{X}_2}{S_{\overline{D}}}$
7. Ho: $p>0.05$, there is no significant difference

   H1: $p<0.05$, there is significant difference

3.6.6 Analyzing the data of Questionnaire and Interview

The researcher used the open and close ended questionnaire. So, the result divided into two, percentage result and essay result. In collecting the questionnaires and interview results, the researcher counted them using the formula below:

$$P = \frac{F \times 100}{N}$$

Note :
P : Percentage
F : Frequency
N : Response
100 : constant