CHAPTER III

THE RESEARCH METHODOLOGY

A. The Research Design

This research is an experimental research. According to Gay, the experimental method is the only method of research that can truly test hypotheses concerning cause and effect relationships.[1] The design of this research is quasi experimental design, which uses the nonequivalent control group design. According to Cresswell, quasi experimental design is experimental situations in which the researcher assigns, but not randomly, participants to groups because the experimenter cannot artificially create groups for the experiment.[2] The writer uses intact groups, the first class is as the experimental group and the second class is as the control group. They are treated differently, however, the teacher, the length of the time, and material are the same. Experimental class and control class are using pre-test and post-test, but, treatment is conducted to experimental group only.

The experimental group is treated by using Audio Segment method. And control group is not be treated by Audio Segment method. There are two variables involve inthis research, one is independent variable (Audio Segment method) and the other is dependent variable (students' listening comprehension).

Independent variable is frequently manipulated that include, method of instruction, type of reinforcement, arrangement of learning environment, type of learning materials, and length of treatment. Dependent variable is also called the criterion, effect, or outcome

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[1] L.R. Gay and Peter Airasian, *Educational Research Competencies for Analysis and Application Sixth Edition* (New Jersey: Pearson Education, 2 **31**

[2] John W. Cresswell, *Education   h: Planning, Conducting and Evaluating Quantitative and Qualitative Research* (New Jersey: Pearson Education, 2008), 645.

variable, shows the result of the study, the change or difference in groups that occurs as a result of the independent variable.[3]

The purpose of this researchwas intended to compare the students' listening comprehension from experimental class and control class. The design of this research is drawn as follows:[4]

Table III.1
Research Design: Non-Equivalent

Class	Pre-Test	Treatment	Post-Test
Experiment	O_1	X	O_2
Control	O_1	-	O_2

Where:

O1 = Pre-Test for both experimental and control Group

O2 = Post-Test for both experimental and control Group

X = Receive the treatment

B. The Location and Time of the Research

This research was conducted at State Senior High School (SMA) Muhammadiyah Pekanbaru. It is located on K. H. Ahmad Dahlan Street. This research had been done from August to September 2013.

C. The Subject and Object of the Research

The students of the second year at Senior High School Muhammadiyah Pekanbaruwith the total 50 students were the subjects of this research, while the object was using Audio Segment toward students' listening comprehension.

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[3]*Ibid.*

[4]Emzir. 2011. *Metodologi Penelitian Pendidikan: Kualitatif Dan Kuantitaif.* Jakarta: PT. Rajagrafindo Persada. p. 105

D. The Population and Sample of the Research

The population of this research was the second grade students of state senior high school (SMA) Muhammadiyah Pekanbaru. There were nine classes of all the second grade students. The number of students was 279 students and each class consisted of 25-30 students. They were divided into two majors, social and science major. It can be seen in the following Table Population:[5]

Table III.2
The Total Population of the Second Grade Students of
Senior High School Muhammadiyah Pekanbaru

No.	Class	Population		Total	Treatment
		Female	Male		
1	XI IPA 1	12	13	25	T
2	XI IPA 2	14	11	25	-
3	XI IPA 3	15	10	25	-
4	XI IPA 4	21	9	30	-
5	XI IPA 5	20	12	32	-
6	XI IPS 1	26	8	34	-
7	XI IPS 2	23	12	35	-
8	XI IPS 3	21	15	36	-
9	XI IPS 4	22	15	37	-
	Total	181	109	279	

The population above was large enough to be sample of this research. So, the writer used cluster sampling randomly in order to take sample of the research. According to Gay "Cluster random sampling is a sampling technique where the researcher randomizes the group of sample"[6]. Gay said that it was done by selecting group not individual because all members of the selected group have similar characteristics.[7] It means that the subject of this research

[5]Interview data from English Teacher of SMA Mutu Muhammadiyah Pekanbaru, 18 December 2012
[6]Gay, L.R and Peter Airaisan, *Op.Cit*, p. 134
[7]Gay .Opcit. P. 129

have the same material, the same grade, and the same teacher in teaching these classes. The writer wrote the names of all classes in the rolled paper. After that, the writer took two rolled paper randomly. The classes were chosen to be the sample of research.

After doing clustering sampling randomly, the writer took XI IPA 1 class as an experimental class and XI IPA 2 class as a control class. Those were as the sample of the research by numbers 25 students for experimental class and 25 students for control class. Therefore, the sample was 50 students. According to Gay "a good sample is one that is representative of the population".[8] Further, in determining sample size, he elaborated that for experimental and comparative studies, a minimum of 30 participants in each group is recommended.[9]

Table III.3
The Sample of the Research

No	Class	Female	Male	Total
1	XI IPA 1	12	13	25
2	XI IPA 2	15	10	25
	Total			50

E. The Technique of Collecting the Data

To find out the effect of using Audio Segment toward students' listening comprehension at SMA Muhammadiyah Pekanbaru, the writer used Test technique. The type of the test was multiple choice tests. The numbers of the questions were 20 questions. The writer recorded native speaker as instrument of the test in this research, because the writer referred to the indicators and students' level of state senior high school (SMA Mutu Muhamadiyah) Pekanbaru . The questions were related to the indicators of listening comprehension. Before doing the test, the writer tried out the test items before students were given the test of this research.

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[8] *Ibid*
[9] *Ibid*

1. Procedures of collecting data for experimental group.

   In experimental group, there were three procedures of collecting data:

   a. Pre-test:

   Pre-test was given to the studentsbefore the students taught by using Audio Segment. It had been used to measure the students listening comprehension especially in monolog text before they were taught by using Audio Segment.

   b. Treatment:

   In treatment, the students were taught by using Audio Segment. Teacher plays the Audio of monologue text to the students and the students simply listen. After listening to the audio, the students write a summary in English. The teacher also asks specific questions pertaining to the story, the characters and the plot to ensure that students are understanding the audio portion. The teacher plays the segment for the fourth time to encourage the students to pick up any vocabulary and grammar they were unable to comprehend previously. After that the teacher follows up the listening portion of the lesson with a reading activity.

   c. Post-test:

   Post-test was a test given to the students after they were taught by using Audio Segment. It was used to know whether the students could easily comprehend the monologue text by using Audio Segment or not. The result had been compared with pre-test to get the effectiveness of the method and to know students' listening comprehension after being taught by using Audio Segment.

2. Procedures of collecting data for control group.

   In control group, there were three procedures of collecting data:

   a. Pre-test

Pre-test was given by the teacher before the students were taught by using non-Audio Segment. It had been used to measure the students listening comprehension especially in monolog text before they were taught by using Audio Segment.

b. Treatment

In treatment, the students were taught by using non-Audio Segment. Teacher gave audio of the monologue text to the students with the some of the questions. Then, the students answered the question that they heard.

c. Post-test:Post-test was a test given to the students after they were taught by using non-Audio Segment. It was used to know whether the students could easily comprehend the monologue text by using conventional Technique or not. The result had been compared with pre-test to get the effectiveness of the technique and to know students' listening comprehension after being taught by using conventional Technique.

After the students did the test, the writer then took the total score from the result of the listening comprehension test. The classification of the students' score can be seen from the table below:[10]

Table III.4
The Classification of the Students' Score

Score	Categories
80 – 100	Very good
66 – 79	Good
56 – 65	Enough
40 – 55	Less

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[10]Suharsimi Arikunto. *Dasar-Dasar Evaluasi Pendidikan.* (Jakarta: Bumi Aksara. 2009). p. 245.

| 30 – 39 | Fail |
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F. The Item of Difficulties and Reliability of the Test

1. The Item of Difficulties

Before giving the instrument, it should be tried out to obtain the degree of difficulties of the items. The test was tried out to 25 students of first year in the XI IPA 3 class. The writer used all of items in try out. Try out was intended to know the value of the test. The value itself was used to find out the level of difficulties of each item. The formula of item difficulty is as follows:[11]

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

Where: P = Index of difficulty or facility value

B = The number of correct answers

JS = The number of examinees or students

The difficulty level of an item shows how easy or difficult a particular item in a test. The items do not reach the standard level of difficulty are excluding from the test and they are changed with new items that are appropriate.

The standard level of difficulty used is   0.30 and   0.70.[12] It means that an item is accepted if the level of difficulty is between 0.30 – 0.70 and it is rejected if the level of difficulty is less than 0.30 (the item is too difficult) and over than 0.70 (the item is too easy). The proportion of correct is represented by "p", whereas the proportion of incorrect is represented by "q". The calculation of item difficulty can be seen from the following table:

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[11]*Ibid.* p. 209
[12]Ibid. p. 208

Table III.5
The Students' are Able to Identify the Topic of the Monolog Text
That They Heard

Indicator	The students are able to identify the topic of the monolog text that they heard					N
Item No.	1	2	5	13	17	
Correct	15	11	12	15	15	25
P	**0.6**	**0.44**	**0.48**	**0.6**	**0.6**	
Q	0.4	0.56	0.52	0.4	0.4	

$$P = \frac{B}{JS} \qquad\qquad P = 2.72$$

$$Q = 1.00 - P \qquad\qquad \textbf{Mean} = \textbf{0.68 (0.68} \quad \textbf{0.30, 0.68} \quad \textbf{0.70)}$$

Based on the table I above, the proportion of correct answer for item number **1** shows the proportion of correct **0.6**, item number **2** shows the proportion of correct **0.44**, item number **5** shows the proportion of correct **0.48**, item number **13** shows the proportion of correct **0.6**, item number **17** shows the proportion of correct **0.6**. Based on the standard level of difficulty "p" <0.30 and >0.70, it is pointed out that item difficulties in average of each item number for finding factual information are accepted.

Table III. 6
The Students' are able to Identifythe Specific Information of the Monolog Textthat they heard

Indicator	The students are able to identify specific information of the monolog text that they heard					N
Item no.	3	6	9	15	20	
Correct	13	14	13	16	15	
P	**0.52**	**0.56**	**0.52**	**0.64**	**0.6**	25
Q	0.48	0.44	0.48	0.36	0.4	

$P = \dfrac{B}{JS}$ P = 2.84

Q = 1.00 – P   Mean = 0.71 (0.71   0.30, 0.71   0.70)

Based on the table II,the proportion of correct answer for item number **3** shows the proportion of correct **0.52**, item number **6** shows the proportion of correct **0.56**, item number **9** shows the proportion of correct **0.52,** item number **15** shows the proportion of correct **0.64** and item number **20** shows the proportion of correct **0.6.** Based on the standard level of difficulty "p" <0.30 and >0.70, it is pointed out that item difficulties in average of each items number for finding factual information are accepted.

TABLE III. 7
The Students are Able to Identify the Purpose of the Monolog Text That They Heard

Indicator	The students are able to identify the purpose of the monolog text that they heard					N
Item no.	7	10	12	16	18	
Correct	16	13	14	14	13	25
P	0.64	0.52	0.56	0.56	0.52	
Q	0.36	0.48	0.44	0.44	0.48	

$P = \dfrac{B}{JS}$ P = 2.8

Q = 1.00 – P   Mean = 0.7 (0.7   0.30, 0.7   0.70)

Based on the table III, the proportion of correct answer for item number **7**shows the proportion of correct **0.64**, item number **10** shows the proportion of correct **0.52**, item number **12**shows the proportion of correct **0.56,** item number **16** show the proportion of correct **0.56,** and item number **18** show the proportion of correct **0.52**. Based on the standard level of difficulty "p" <0.30 and >0.70, it is pointed out that item difficulties in average of each items number for finding factual information are accepted.

TABLE III. 8
The Students are Able to Identify the Argument of the Monolog TextThat They Heard

Indicator	The students are able to identify the argument of the monolog text that they herad					N
Item No.	4	8	11	14	20	
Correct	13	12	12	13	15	25
P	**0.52**	**0.48**	**0.48**	**0.52**	**0.6**	
Q	0.48	0.52	0.52	0.48	0.4	

$$P = \frac{B}{JS} \qquad\qquad P = 2.6$$

$$Q = 1.00 - P \qquad\qquad Mean = 0.65 \ (0.65 \quad 0.30, 0.65 \quad 0.70)$$

Based on the table IV above, the proportion of correct answer for item number **4** shows the proportion of correct **0.52**, item number **8** shows the proportion of correct **0.48**, item number **11** shows the proportion of correct **0.48,** item number **14** show the proportion of correct **0.52,** item number **20** show the proportion of correct **0.6**. Based on the standard level of difficulty "p" <0.30 and >0.70, it is pointed out that item difficulties in average of each items number for finding factual information are accepted.

From the calculation above, it can be seen that each indicator has different result of total proportion of correct answer and result of mean.

To know the standard level of difficulty for all indicators, then, the whole mean of indicators calculated. The calculation can be seen as follows:

Table III.9
The Calculation of the Whole Mean

Number of Indicator	Mean
1	0.68
2	0.71
3	0.7
4	0.65
Total	**2.74**
Mean	**(2.74/4) = 0.68**

Based on the table, the total proportions of correct answer of the whole indicators are 2.74 and the whole mean are 0.68. The standard level of difficulty is > 0.30 and < 0.70 (0.68   0.30 and 0.68   0.70). So, the standard level of difficulty of research instrument is accepted. On the other words, the whole indicators are not too easy and not too difficult.

2. Reliability of the Test

Reliability is a necessary characteristic of good test. Reliability is used to measure the quality of the test scores and the consistency of the test. According to Shohamy there are five types of reliability. They are test retest, parallel forms, internal consistency, inter rater and intra rater.[13] Calculation of reliability uses various kinds of formula. They are Spearman-Brown formula, Flanagan formula, Rulon formula, Hoyt formula, Alfa formula, Kuder Richardson 20 formula, and Kuder Richardson 21 formula.[14] From all of these formula, the writer then used the Kuder Richardson 20 (KR 20) formula to calculate the reliability of the test. The formula can be seen as follows:[15]

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[13]Elana Shohamy. *A Practical Handbook in Language Testing for the Second Language Teacher.* (Israel: Tel-Aviv University. 1985). p. 70.
[14]Suharsimi Arikunto. *Loc. Cit.* p. 180
[15]*Ibid.* p. 188

$$r_{11} = \frac{k}{k-1} \cdot \frac{V_t - \sum pq}{V_t}$$

Where: r_{11} = Instrument reliability

k = Number of items

V_t = Variance total (the square of Standard Deviation)

p = The proportion of the students who are correct in answering an item divided with the total number of the students

q = The proportion of the students who are incorrect in answering an item divided with the total number of students

Then, according to Suharsimi[16], there are the interpretations of reliability as follows:

Table III.10
The Reliability Classification

No.	Classification	Score
1	Very high	0.800 – 1.00
2	High	0.600 – 0.800
3	Enough	0.400 – 0.600
4	Low	0.200 – 0.400
5	Very low	0.0 – 0.200

The data can be seen at Appendix 6, the data can be calculated as follows:

K = 20 $\sum pq$ = 4.88

V_t = 127.23

$$r_{11} = \frac{k}{k-1} \cdot \frac{V_t - \sum pq}{V_t}$$

$$r_{11} = \frac{20}{20-1} \cdot \frac{128.36 - 4.88}{128.36}$$

$$r_{11} = \frac{20}{19} \cdot \frac{123.48}{128.36}$$

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[16]*Ibid.* p. 65

$$r_{11} = (1.05)(0.96)$$

$$r_{11} = 1.00$$

According to Suharsimi, the result of reliability of the students' score of the test was very high reliability. On the other words, the instrument is reliable because the value was categorized into classification 1 (between 0.800 – 1.00).

G. The Technique of Data Analysis

1. Independent Sample t_{test}

In order to find out whether there is significant effect beforeand after using Audio Segment toward listening comprehension between the second grade students at SMA Muhammadiyah Pekanbaru who were taught and who were not taught by using Audio Segment, the data was analysed statistically. The technique of data analysis in this research used software of SPSS 16.To know there is significant difference or there is no significant difference between two or more variables can be analysed by using Independent Sample t_{test}.[17]Gay added that the t-test for independent sample is used to determine whether there is probably a significant difference between the means of two independent samples.[18]The formula is as follow:

$$t_{o} = \frac{M_x - M_y}{\sqrt{\left(\frac{SD_x}{\sqrt{N-1}}\right)^2 + \left(\frac{SD_y}{\sqrt{N-1}}\right)^2}}$$

Where:

t_0 =   Table Observation

SD   =   Standard Deviation

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[17]Hartono, *Statistik Untuk Penelitian* (Pekanbaru: Pustaka Pelajar, 2010), p.177-9.
[18]L.R Gay, Op.cit, p. 484.

$$M_x \quad = \quad \text{Mean of variable x and}$$

$$M_y \quad = \quad \text{Mean of variable y}$$

$$SD_x \ = \quad \text{Standard deviation of experimental group}$$

$$SD_y \ = \quad \text{Standard deviation of control group}$$

$$N \quad = \quad \text{The Number of respondent}$$

The t-table has the function to see if there is a significant difference among the mean of the score of both experimental and control group. The t-obtained value is consulted with the value of t-table at the degree of freedom (df) = (N1+N2)-2 which is statistically hypothesis:

Ha: to > t-table

Ho: to < t-table

Ha is accepted if to > t-table or there is effect after using Audio Segment toward students' listening comprehension.

Ho is accepted if to< t-table or there is no effect after using Audio Segment toward students' listening comprehension.

2. Nonindependent Sample t_{test}

Nonindependent sample t_{test} is known also as Paired-Sample t_{test}. The researcher used this formula to answer the third formulation of the problem because L.R Gay states that t test for non independent samples is used to compare groups that are formed by some type of matching or to compare a single group's performance on a pre- and posttest or on two different treatments[19]. In this time, the writer used to find out whether there is significant effect before and after using Audio Segment toward listening comprehension by using the pretest and postest score of experimental class. To obtain the data, the writer used SPSS 16. The formula of paired-sample t_{test}:

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[19]L.R Gay, Op.cit, p. 488.

$$t = \cfrac{\overline{D}}{\sqrt{\cfrac{\sum D^2 - \cfrac{(\sum D)^2}{N}}{N\,(N-1)}}}$$

D : Gain Score (D=X2-X1)

The t-table has the function to see if there is a significant difference among the mean of the score of both pretest and posttest. The t-obtained value is consulted with the value of t-table at the degree of freedom (df) = N-1 which is statistically hypothesis:

Ha: to > t-table

H_0: to < t-table

Ha : is accepted if to > t-table or there is significant effect after using Audio Segment toward students' listening comprehension.

H_0 : is accepted if to< t-table or there is no significant effect after using Audio Segment toward students' listening comprehension.