

## **CHAPTER III**

### **METHODOLOGY**

In this chapter, the writer would like to give the description about the methodology. This chapter consists of research design, population and sample, research instrument, and procedure of collecting data.

#### **3.1 Research Design**

Based on the purpose of this study, the researcher used Experimental design. Experimental research is the effect of the process of manipulation of control group and experimental group ([http://en.wikipedia.org/wiki/Design\\_of\\_experiments](http://en.wikipedia.org/wiki/Design_of_experiments)). According to Ary (1990:298), Experiment is a scientific investigation where the experimenter controls one or more independent variable and observes their effect of the manipulation of dependent variable. It means that the researcher control and observes the effect of manipulate process in the control group and experimental group.

Based on Ary (1990:321), Experimental design are classified into three designs depend on the degree of control provided; Pre-Experimental design, True Experiment design, and Quasi-Experimental design. Actually, the goal of the researcher is to use the full experiment design with randomization procedures but, there are many situations that is impossible for researcher to conduct True Experiment design because she may not possible to random the students in the class. So, she used Quasi-experimental design. Based on Best (1981:68) Quasi – Experimental design happens because the random process to control group and

experiment group cannot be applied. In this study, researcher decided to use Pre test and post test because she needed to do two observations; before treatment and after treatment to know the influence of Illustration Interaction Induction ('three Is') method to students' speaking skill in two group of subjects.

### The Research Design

(Pre – test and Post – test design)

Group	Pre – test	Treatment	Post – test
Experiment	+	+	+
Control	+	-	+

**Table 3.1 Pre – test and post – test Quasi – experimental design**

Explanation:

+ : With treatment of Illustration – Interaction – Induction (“Three I’s”) method.

- : Without treatment of Illustration – Interaction – Induction (“Three I’s”) method.

### 3.2 Population and Sample

The participant of this study was 11<sup>th</sup> science grade class of Semen Gresik Senior High School in second semester 2013/2014 academic year. The researcher used Semen Gresik Senior High School because this school never used Illustration – Interaction – Induction (“Three I’s”) method before. That was known by the researcher after she interviewed with the English teacher in Semen Gresik Senior High School.

The population of this research was 11<sup>th</sup> Science grade students at Semen Gresik Senior High School in second semester. Because the population was large

so the researcher decided to use cluster sampling technique to take the samples. Based on Ary (1990), Cluster sampling is choosing a group of individual who are already together not an individual. So, the researcher took two classes of 11<sup>st</sup> science class as the sample from six classes, they were 11.IPA.2 as experimental group which contained 22 students but the researcher took 15 students because it was impossible to take data from all students and 11.IPA.5 as control group which contained 22 students. So, the total number of population was 37 students. The researcher took 11<sup>th</sup> Science grade students to make the language specify more. They have similar characteristics, from their ability and their effectiveness in the class. So, the sample is homogenous. The students would receive for about one month Illustration – Interaction – Induction (“Three I’s”) treatment.

### **3.3 Data Collection**

In this study, the data was collected from speaking test. The researcher collected the data by conducting a test before the treatment (pre-test) to Control Group and Experimental Group in order to know their ability in speaking before the treatment and a test after the treatment (post-test) to know the influence of Illustration – Interaction – Induction (“Three I’s”) toward their speaking skill. The result of the test presented the individual response to the treatment. After that, the researcher analyzed the result of pre-test and post-test of two groups by using , Independent sample t-test in SPSS 15 .0 program to know the influence of Illustration – Interaction – Induction (“Three I’s”) toward the students’ speaking skill.

### 3.3.1 Research Instrument

The data of this study was taken from two 11<sup>st</sup> science classes of Semen Gresik senior High School. Each class consisted of 22 students. In collecting the data, kind of instruments that researcher used is speaking test. The test is used to measure students' speaking skill and get information about the effect of Illustration – Interaction – Induction (“Three I’s”) toward students' speaking skill.

In measuring the students' speaking skill (Pronunciation, Grammar, Vocabulary, Fluency, and Comprehension in speech), the researcher used rating scale to help her give a score to the students. Based on Harris (1969), the rating scale of oral English used 1-5 points. It can be seen in the following table:

No	CRITERIA	RATING SCORE	COMMENTS
1	Pronunciation	5	How fast traces of foreign language
		4	Always intelligible, though one is conscious of a definite accent
		3	Pronunciation problem necessities concentrated listening and occasionally lead to misunderstanding
		2	Very hard to understand because of pronunciation problem, most frequently be asked to repeat
		1	Pronunciation problem to serve as to make speech virtually unintelligible
2	Grammar	5	Make few (if any) noticeable errors of grammar and word order occasionally makes grammatical
		4	And or word orders errors that do not, however obscure meaning
		3	Make frequent errors of grammar and word order, which occasionally obscure meaning
		2	Grammar and word order errors make comprehension difficult, must often rephrases sentence and or rest rich himself to basic pattern
		1	Errors in grammar and word order, so, serve as to make speech virtually

			unintelligible
3	Vocabulary	5	Use of vocabulary and idioms is virtually that of native speaker
		4	Sometimes uses the wrong word conversation somewhat limited because of inadequate vocabulary
		3	Frequently uses the wrong words conversation somewhat limited because of inadequate vocabulary
		2	Misuse of words and very limited vocabulary makes comprehension quite difficult
		1	Vocabulary limitation so extreme as to make conversation virtually impossible
4	Fluency	5	Speech as fluent and efforts less as that of native speaker
		4	Speed of speech seems to be slightly affected by language problem
		3	Speed and fluency are rather strongly affected by language problem
		2	Usually hesitant, often forced into silence by language limitation
		1	Speech is so halting and fragmentary as to make conversation virtually impossible
5	Comprehension	5	Appears to understand everything without difficulty
		4	Understand nearly everything at normal speed although occasionally repetition may be necessary
		3	Understand most of what is said at slower than normal speed without repetition
		2	Has great difficulty following what is said can comprehend only social conversation, spoken slowly and with frequent repetition
		1	Cannot be said to understand even simple conversational English

**Table 3.2 Oral English rating Scale**

### 3.3.1.1 Test

The researcher gave two tests (Pre-test and Post-test) to the Control Group and Experimental Group in order to know whether there was significant influence on the use of Illustration – Interaction – Induction (“Three I’s”) toward 11<sup>th</sup> science students’ speaking skill at Semen Gresik Senior High School. Before

giving the tests, the researcher measured the validity of the tests to know whether the tests are proper to be given to the students or not.

Pre-test was given to find out the first students' speaking skill score between Experimental Group and Control Group. The test was given before the treatment of Illustration – Interaction – Induction (“Three I’s”) applied. The test that was used was speaking test. The speaking test was carried out based on the course book of the 11<sup>th</sup> grade of Semen Gresik Senior High School.

While, the post-test gave after the treatment of Illustration – Interaction – Induction (“Three I’s”) applied to the Experimental Group. The researcher designed the post-test different with pre-test but, they were still equal in every item. It was in order to find out whether there is the influence of Illustration – Interaction – Induction (“Three I’s”) method toward students speaking skill or not. Post-test was the test result after the treatment applied.

The speaking tests contained 4 items. The selection tests was adapted with syllable of SMA 11<sup>st</sup> grade in first semester were Expressions of giving suggestion, The respond of accepting and declining suggestion, Expressions of offering something, The respond of accepting and declining offering.

SUB BASIC COMPETENCE	FOCUSE ITEMS	QUESTIONS NUMBERS	
		PRE-TEST	POST-TEST
4.1.1 Develop a spoken text to express the making suggestion 4.1.2 Develop a spoken text to express the asking suggestion	Expressions of giving suggestion	1 item	1 item
4.1.3 Develop a	The respond of	1 item	1 item

spoken text to express the responds of suggestion	accepting or declining suggestion		
4.1.4 Develop a spoken text to express offering something	Expressions of offering something	1 item	1 item
4.1.5 Develop a spoken text to express the responds of offering something	The respond of accepting or declining offering	1 item	1 item
Total Items		4 items	4 items

**Table 3.3 Distribution of items**

### 3.3.1.2 Validity

According to Ary (1990:256), Research is always depending on the measurement. Validity refers to how far the instrument measures what it is intended to measure. Validity is needed before conducting pre-test and post-test because the items of the tests must be valid. There are three types of validity; Content, Predictive, Construct. But, the researcher was measured it by analyzing the content validity. According to Ary (1990:258) Content Validity is not always in numeric form but it can be determined whether the test's items reflect the course and objective in curriculum guides, syllabus, and course books. To test the content validity, the researcher compared the content of instrument to the subject based on English curriculum and English syllabus. If the test content reflect the curriculum guides, syllabus, and course books, then the test can be said have content validity. Then the researcher may conduct the pre-test when the test content can be said valid.

BASIC COMPETEMCE	SUB BASIC COMPETENCE	QUESTIONS	
		PRE-TEST	POST-TEST
4.1 Develop oral and written texts to express, to ask, and to respond expressions of making suggestion and offering something to take attention the social function, the structure of the text, and linguistic elements which are correct and appropriate context	4.1.1 Develop a spoken text to express the making suggestion 4.1.2 Develop a spoken text to express the asking suggestion	1. You know your friend is sick. What will you suggest to her?	1. What is your suggestion for your school?
	4.1.3 Develop a spoken text to express the responds of suggestion	2. You get a influenza and your mother suggests you to see the doctor, while you have a lot of home works. What is your respond and what will you say if you accept/decline her suggestion?	2. How if you are the head master and your students suggest you to be more distinct but you can't do it because you afraid if they hate you. What is your respond and what will you say to your students if you accept and decline their suggestion?
	4.1.4 Develop a spoken text to express offering something	3. You see old people are crossing the road and you want to help them. What will you say to them?	3. This old woman brings 30kg cabbages. You see her walk in front of you and you want to help her. What will you say to her?
	4.1.5 Develop a spoken text to express the	4. How if you are the old people in the	4. How if you are the old woman in

	responds of offering something	picture and suddenly there is a stranger come to you and offering a help. What is respond and what will you say if you accept/decline his help?	the picture. You bring a lot of vegetables everyday but you can get a lot of money because it is your job. But, suddenly there is a stranger come to you and offering help. What is your respond and what will you say if you accepts/decline his help?
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**Table 3.4 Analyzing Content Validity**

### 3.3.2 Procedure of Collecting Data

There were three procedures in collecting data: first, the researcher chose the subject and divided into two groups, the experiment group and the control group who were taught Illustration – Interaction – Induction (“Three I’s”). The researcher gave a pre – test to both group before treatment. Pre – test score would be a first data.

Second, the researcher gave the treatment of Illustration – Interaction – Induction (“Three I’s”) to experiment group. The treatment occurred for about a month in three times meeting.

The last, after a month treatment, both group measured on post – test. The score in the post – test were recorded and analyzed by using statistical calculations for data analysis. Finally, the researcher could conclude whether there was the influence of Illustration – Interaction – Induction (“Three I’s”) method to the students speaking skill.

### **3.4 Technique of Analyzing Data**

The purpose of analyzing data was to answer the research problem with get through pre – test and post – test. In this study, the researcher analyzed the data by using Independent sample t-test in SPSS 15 .0. The researcher used independent sample t-test because the sample was small and the groups were independent. It was carried out to decide whether there was significant difference between experimental group and control group after one month treatment.

Assumptions for the independent t-test: (1) Independence: Observations within each sample must be independent (they do not influence each other), (2) amount of subject in every group are same or neared and, (3) Normal distribution: The scores in each population must be normally distributed and, (4) Homogeneity of Variance: Two populations must have equal variances (the degree to which the distributions are spread out is approximately equal).

In this research, the researcher did not use normality distribution because the research design was Quasi – Experimental design where the students could not be randomized and researcher only used the available classes so, normality distribution was not necessary.

### 3.4.1 Homogeneity Test of Variance

For homogeneity test, the researcher used one Levene's test of homogeneity test in SPSS 15.0 version. The purpose of this test was to analysis the variances of the observation in Control Group and Experimental Group were equal. Because the researcher could not random the students so, homogeneity test was necessary to make sure the students in both of class had same ability in speaking English or not and the researcher could conduct the treatment. The test of Levene's test (P) was defined as follows:

$$P = \frac{(N - k) \sum_{i=1}^k N_i (Z_{i.} - Z_{..})^2}{(k - 1) \sum_{i=1}^k \sum_{j=1}^{N_i} (Z_{ij} - Z_{i.})^2}$$

Where:

- P is the result of the test,
- $k$  is the number of different groups to which the samples belong,
- N is the total number of samples,
- $N_i$  is the number of samples in the  $i$ th group,
- $Y_{ij}$  is the value of the  $j$ th case from the  $i$ th group,
- $Z_{ij} = \begin{cases} |Y_{ij} - \bar{Y}_i|, & \bar{Y}_i \text{ is a mean of } i\text{-th group} \\ |Y_{ij} - \tilde{Y}_i|, & \tilde{Y}_i \text{ is a median of } i\text{-th group} \end{cases}$

The significance of  $P$  was tested against  $F(\alpha, k - 1, N - k)$  where  $F$  was a quantile of the F-test distribution, with  $k - 1$  and  $N - k$  its degrees of freedom, and  $\alpha$  was the chosen level of significance (0.05 or 0.01).

The procedures in analyzing the homogeneity by using SPSS version 15.0 were as follow: after the pre-test data of both experimental and control group were input, then clicked Analyze → Compare Means → Independent Sample T-test, in Independent Sample T-test menu, input the score variable into Test Variable column and the group variable into Grouping Variables, then defined groups, put code 2 for experimental group in group 1 and code 5 for control group in group 2 Continue then click OK.

### 3.4.2 Hypothesis Testing using an Independent Sample t-Test

The used of Independent t-test is to find out the significant differences between experimental group and control group. The steps of t-test calculation were:

1. Test the hypothesis of the research and setting the  $\alpha$  (alpha) level at 0.05 (two tailed test). The hypothesis could be formulated as follows:  
 $H_0$ : there was no significant influence on the use of Illustration Interaction Induction ('Three Is') between experimental group and control group.  
 $H_1$ : there was significant influence on the use of Illustration Interaction Induction ('Three Is') between experimental group and control group.
2. Finding t-value using Independent-Sample t-Test and comparing the probability with the level of significance for testing the hypothesis. After the scores were computed in SPSS 15.0 version, then saw the output of Independent-Sample t-Test and interpreted the output that if sig. (2-tailed)  $> \alpha$  (0,05), the researcher should accept the  $H_0$ , but if sig. (2-tailed)  $< \alpha$  (0,05) so the researcher can reject  $H_0$ , it means  $H_1$  is accepted.

T-test was calculated in order to find out the comparison of two means between Control Group and Experimental Group pre-test and post-test. In analyzing the data, the researcher used independent t-test formula. In calculating t-test, the formula was as follow:

$$t = \frac{(x_1 - x_2) - (\mu_1 - \mu_2)}{S_{x_1-x_2}}$$

Where:

$t$  is t value

$x_1$  is average group 1

$x_2$  is average group 2

$S$  is standard error of the two groups

$\mu_1 - \mu_2$  is always defaults to 0

Where:

$$S_{x_1-x_2} = \sqrt{\frac{S^2_{pooled}}{n_1} + \frac{S^2_{pooled}}{n_2}}$$

$S_{x_1-x_2}$  is standard error of two groups

$S^2_{pooled}$  is variants of the two groups

$n_1$  is Number of sample group 1

$n_2$  is Number of sample group 2

Pooled variance: the average of the two sample variances, allowing the larger sample to weight more heavily.

Formula:

$$S_{pooled}^2 = \frac{(df_1)s^2_1 + (df_2)s^2_2}{df_1 + df_2} \quad \text{or} \quad S_{pooled}^2 = \frac{SS_1 + SS_2}{df_1 + df_2}$$

$$df_1 = df \text{ for } 1^{\text{st}} \text{ sample; } n_1 + 1$$

$$df_2 = df \text{ for } 2^{\text{nd}} \text{ sample; } n_2 + 1$$

Estimated standard error of the difference:

$$S_{x_1-x_2} = \sqrt{\left(\frac{SS_1 + SS_2}{n_1 + n_2 - 2}\right) \left(\frac{1}{n_1} + \frac{1}{n_2}\right)}$$

Clearly, the results of the tests were subjected for the following statistical procedures. In calculating t-test, the researcher uses SPSS 15.0 version. The steps in analyzing the data of post-test of both experimental and control group were as follow: first, input the data of post-test in SPSS program between experimental and control group, then click Analyze → Compare Means → Independent Sample T Test. In Independent Sample T Test, input the score variable into Test Variable column, and group variable into Grouping Variable column, then click Define Group, choose group 1 (for experimental) and group 2 (for control), then click OK.