III.RESEARCH METHOD

This chapter describes the design of the research, how to collect the data from the sample of the research and how to analyze the data. This chapter also describes the research procedure, validity, and reliability of the instrument, data treatment and hypothesis testing.

3.1 Research Design

In this research the reseacher used quantitative research. Quantitative research is used to examine the research question that can from the answered by collecting statistically analyzing data that are in numerical form (Crowl, 1991:10). This quantitative research intends to find out whether there is any significant difference of students' speaking ability after being taught through problem solving. In conducting the research, the researcher used time series design by giving different topics for each treatment and every test. The researcher used one class where the students were given three times pre-test, three times treatment, and three times post-test. The research design is described as follows:

$$T1 \ T2 \ T3 \ X \ T4 \ T5 \ T6$$

Note: T1 T2 T3   :Pre-test

        X   :Treatment

T4 T5 T6　　:Post-test　　(Setiyadi,2006: 131)

Pre-test was administered before the treatment of teaching speaking through problem solving technique was implemented in order, to see the students' basic speaking ability. Then, the researcher gave treatment that is teaching speaking through problem solving technique. The reseacher also used treatment to know the effective topic for teaching speaking. The post-test was adminstered afterward, to analyze how the improvement of their speaking ability through problem solving technique.

3.2 Sample and Population

This research was conducted at SMAN 1 Simpang Pematang. There are four classes of second grade and every class has the same opportunity. The sample was class X1 consisting of 30 students that had been chosen through lottery drawing.

3.3 Data Collecting Techique

The data of this research was in the form of students' speaking ability in performing transactional dialogue in terms of pronunciation, fluency, and comprehensibility under three topics: which topics are Friend, Family and Holiday. In collecting the data, the researcher used the following steps:

3.3.1 Administering the Pre-test
The pre-test was administered to the students before the treatment of teaching speaking through problem solving technique was implemented. The pre-test was

conducted in order to know the students' basic speaking ability. Meanwhile, before conducting the pre-test, the researcher explains the topic that would be tested. The tests were focused in oral test.

3.3.2 Administering the Post-test

The post-test was administered to the students after the treatment of teaching speaking technique through problem solving technique will be implemented. It is a subjective test and focused in oral test. The researcher gives three topics in every test for the students to performance.

3.4 Research Procedure

In collecting the data, the resercher followed the following steps:

1. **Determining the Subject**

   There are four classes at first grade of SMAN 1 Simpang Pematang which consisted of about 30 - 38 students for each class. The sample of this reseacher was chosen by using probability sampling technique as the control and experimental class.

2. **Selecting the Materials**

   The researcher chosen the materials from the students' book based on the syllabus. The material was about understanding and using a problem that they have to solve. The researcher conducted three different topics in increasing students' speaking ability through problem solving technique.

3. **Conducting Pre-test**

The pre-test was adminstered to the students before the treatment of teaching speaking through problem solving technique being implemented in order to know the students' basic speaking ability. Meanwhile, before administering the pre-test, the researcher explained the topic that would be tested. The tests were focused on oral test. The researcher was conducted three times test by giving topics in each test, they are, first pre-test (1st topic: Friend), second pre-test (2nd topic: Family), and the third pre-test (3rd topic: Holiday). It was a subjective test and focused in oral test. The reseacher explained generally the test and asked the students to make a group of two. The researcher gave a problem that they have to solve and tell it in front of the class. In performing the test, the students were asked to speak up clearly since the students' voice would be recorded. Futhermore, the researcher and another English teacher judged the students' performance.

4. **Treatments**

In this research, the treatments were administered in three meetings in which 90 minutes that conducted three different topics in every meeting. The topic used in the first treatment was about " Friend", the second was about " Family", and the third was about "Holiday". At the first treatment the resercher asked the a question related to the problem. She also explains the material by using Problem solving technique. And the next, the researcher asks the students to solve the

problem with their pair group. The procedure of teaching speaking through problem solving technique as follows:

a. Pre Activities

b. While Activities

c. Post Activities

5. **Administering Post-test**

The post-test was conducted after the treatment. The post-test was used to know the progress of speaking ability after using problem solving technique. Based on the research design that is time series design, the post-tests was conducted in three times, after three meetings / treatments. The reseacher used a subjective test in oral test. Futhermore, the researcher gave different topics in every test. The researcher gave a problem for the students to be solved. In giving their solutions, the students were asked to speak clearly since the students' voice would be recorded. Moreover, the researcher and the English teacher "Miss Liza" judged the students' performance.

6. **Analyzing Data**

After conducting the final test, the reseacher analyzed the data. After collecting the data, the students' score were analyzed subjectively by both reseacher and teacher. Then, the reseacher analyzed the mean of every test by comparing from the two raters based on the test. The mean of the pre-tests and the post-tests were used to know the increase of students' speaking ability through problem solving. Meanwhile, the

mean of treatment also uses to know which one is the most effective for teaching speaking.

3.5 Instruments of the Research

There are some instrument used in research. The reseacher used two kinds of test as the instrument of the research; pretest which was given to the students before the writer gave the treatment, and posttest which was given after the students got the treatment.

3.6 Validity and Reliability

Setiyadi (2006: 29) mentions that in order to make research valid and reliable, quantitative research is focused on the collected data. Therefore, because the researcher used quantitative research, some considerations were also going to be taken as follows:

a. Validity of the Test

Validity refers to the appropriateness, meaningfulness, and useful of the interences a researcher makes (Fraenkel and Wallen, 1990:126). It means that validity refers to the extent to which an instrument will give us the information that we want. Meanwhile, Setiyadi (2006: 24) mentions that the test should reflect all the areas to be assessed in suitable proportions and represent a balanced sample.

Other source says that validity is a matter of relevance; it means that the test measures what is claimed to measure. To measure whether the test has good

validity, it has to be analyzed from content and construct validity. In the content validity, the material and the test are composed based on the indicators and objectives in syllabus of KTSP curriculum. The materials that are taught based on the students'handbook for Senior high school. While, the construct validity focuses on the kind of the test that is use to measure the students' ability.

b. Reliability of the Test

Reliability refers to the extent to which the test is consistent in its scores, and it gives an indication of how accurate the scores of the are. Heaton (1988 :162) states that reliability is a necessary characteristic of any good test: to be valid, a test first should be reliable as a measuring instrument .

To ensure the reliability of the score and to avoid the subjectively of the researcher, inter rater reliabilities applied in this research. Inter rater reliability is used when score of the test is independently estimated by two raters. To achieve such reliability and to score the in the students' speaking performance, the researcher:

1.Used a speaking criteria based on Heaton (1991). The focus of speaking skills that have been assesed are:

a. Pronunciation

b. Fluency

c. Comprehensibility

2.Involved second rater in using the profile to give judgement for each students' speaking performance. The second rater was the English teacher who has

experienced in rating the students' speaking ability. It was done to provide the consistent and fair judgement.

3.7 Data Analysis

Data analysis is a process for organizing the data in order to get the explanation form. The reseacher analyzed the data by using these following steps:

1. Transcribing the Students' Spoken

   The reseacher recorded the students' spoken, the reseacher transcribed the record into written form.

2. Scoring the Data

   Each rater scored the students' speaking performance of the test. After that, the two counted the avarage score that was going to be the final score.

3. Calculating the Mean

   The reseacher calculated the data such as the minimum score and the maximum score to know the mean of the test. Then the reseacher maked a graphic based on that data. At least, the reseacher compared both pre-test and post-test to know the increasing. The mean of the test was illustrated through curves as draw below.

Figure 3.1. The Example Graphic Line of Problem Solving
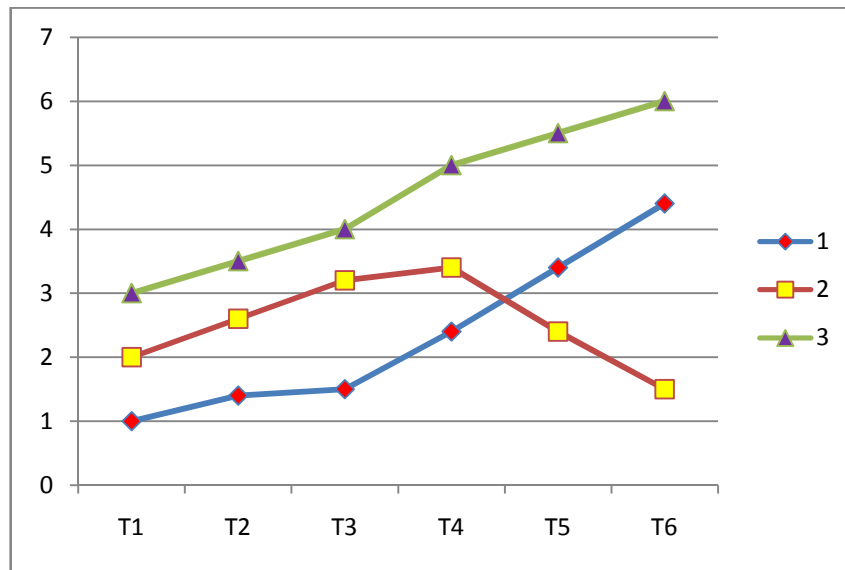
Line 1 indicated that problem solving had a good effect or positive effect in teaching speaking. Line 2 indicated that problem solving that was implemented by using problem solving had a negative effect. And then line 3 indicated that there was no significant difference on students' speaking ability before and after the application of problem solving.

3.8 Testing the Hypothesis

Hypothesis of this research was:

$$H_1 = T_{value} > T_{table}$$

$$H_0 = T_{value} < T_{table}$$

H_1: There is a significant difference of students' speaking ability after being taught through problem solving.

H_0: There is no significant difference of students' speaking ability after being taught through problem solving.

This hyphotesis was statistically analyzed by comparing the mean of both pre test and post test using excel manually, Pair Sample T-Test of SPSS 16 and then make a graph based on the mean score of the test.