

III. RESEARCH METHODS

This chapter deals with the research design, population and sample, variables, data collecting techniques, try out of the instruments, results of the try-out test, research procedures, scoring system, data analysis, and hypothesis testing.

3.1. Research Design

The present study used quantitative and qualitative approaches. That was because both approaches were appropriate to answer the stated research questions in the first chapter. To answer the first, second, and third research question, this study was the quantitative one because its aim was to investigate and support or reject a theory (Setiyadi: 2006). That theory was about morphological analysis that having an awareness of morphological structure and the ability to break down morphologically complex words into their constituent parts may help readers assign meaning to new words they encounter in a text (Anglin, Miller and Wakefield, 1993; Carlisle, 1995).

In attempt to answer the first, second, and third research question, the researcher applied *One Group Pretest-Posttest Design*, a research design in which one group of participants is pretested and then posttested after the treatments have been administered (Hatch and Farhady, 1982). The pretest was given to the students in order to measure the students' entry point before they were given the treatments

and the posttest was given to measure how far the students' achievement was after they got the treatments. The research design was presented as follows:

T1 X T2

Notes:

T1 : pretest

T2 : posttest

X : treatments (teaching morphological analysis)

(Hatch and Farhady, 1982: 24)

Then, to answer the fourth research question, this research was the qualitative one because its aim was to find out the problems faced by the students in analysing words through morphological analysis. To find out those problems, the researcher conducted an observation and interview to the students.

In brief, this research employed a quantitative approach with *One Group Pretest-Posttest Design*. There had to be a difference between the pretest and the posttest scores since the posttest was administered to measure how far the students' achievement was after they were given the treatments. When there was a significant difference, it could be revealed whether there was a positive effect of teaching morphological analysis on the students' reading comprehension achievement or not. Then, this research also used qualitative one since its aim was to find out the problems faced by the students during the treatments by observing and interviewing the students.

3.2. Population and Sample

The population of this research was the second grade of senior high school students at SMAN 9 Bandar Lampung in 2014/2015 academic year. There were 11 classes consisting of 26 to 31 students in each class at the second grade. The sample of this research was one class taken by the researcher as the experimental class, that is, XI LM (Lintas Minat) 5. That class consisted of 26 students from some students in class Social I to IV who gathered in one class to learn English. In addition, the researcher took another class as the try-out class, that is, XI LM (Lintas Minat) 3 consisting of 26 students as well. Both of the classes were chosen by using random sampling so that all the second year classes got the same chance to be the sample to avoid subjectivity.

3.3. Variables

Hatch and Farhady (1982: 12) define a variable as an attribute of a person or of an object which varies from person to person or from object to object. Besides, in order to assess the influence of the treatments in the research, variables can be defined as dependent and independent variables. They state that independent variable is the major variable that a researcher hopes to investigate and dependent variable is variable that the researcher observes and measures to determine the effect of the independent variable. This research consisted of the following variables:

1. Teaching morphological analysis was as independent variable (X) because this variable could influence or had effect on a dependent variable.

2. Students' reading comprehension was as dependent variable (Y) because this variable was observed and measured to determine the effect of the independent variable.

(Hatch and Farhady, 1982)

3.4. Data Collecting Techniques

To collect the data, the researcher used test and non-test data collecting techniques. The first data collecting technique was used in order to answer the first, second, and third research question whether there was a difference on the students' morphological analysis achievement and reading comprehension achievement before and after being taught through morphological analysis teaching and whether morphological analysis teaching affected the students' reading comprehension achievement positively or not. For the test, there were morphological analysis test and reading comprehension test as follows:

3.4.1. Morphological Analysis Test

This test was used as a proof that there had been morphological analysis teaching to the students and to investigate whether that kind of teaching could affect and result in the difference on the students' morphological analysis achievement or not. This test measured the students' ability to reflect and manipulate morphemic units in English. There were two types of morphological analysis test adapted from McBride-Chang *et al.* (2005) and Farsi (2008), that is, Morphemes Identification Test (Analytic Aspect) and Morphological Structure Test (Synthetic Aspect). The items included both inflectional and derivational affixes and also compound words.

The Morphemes Identification Test measured the students' ability to analyze and break down complex words into smaller meaningful chunks. The participants were given a set of complex words and were asked to segment them into as many smaller chunks as they could identify in each word. Below were the instruction and one sample item of this test.

Please segment the following words into meaningful chunks.

e.g. Childhoods: child, -hood, -s.

The second type was Morphological Structure Test (Synthetic Aspect). That test measured the students' morphological productivity, which was the ability to synthesize morphemes to create new meanings. The participants were presented with a frame sentence that contained the usage of the target morpheme and then asked to complete another sentence. The instruction and one sample item were as follows.

Using only one word, come up with names for the objects or actions that are described below. See the example.

Ahmed lived longer than Ali. Ahmed outlived Ali. James performed better than Juliet in the reading test. James Juliet.

Those two tests had been done in 20 minutes and divided into two sections, that is, pretest and posttest. The pretest was administered in order to find out the student's entry point of morphological analysis ability before the treatments in the experimental class. Then, the posttest was administered to measure the students' morphological analysis ability after the treatments.

3.4.2. Reading Comprehension Test

This test was also divided into two sections as follows.

a. Pretest

The pretest was administered in order to find out the student's reading comprehension entry point before the treatments in the experimental class. In this test, the students were given multiple choice test from hortatory exposition texts in 60 minutes. The test items in the pretest were identical with the posttest but the number of the items and arrangement of the texts had been changed randomly for the posttest.

b. Posttest

The aim of this test was to measure the students' reading comprehension achievement after the treatments. In this test, the students were also given multiple choice test from hortatory exposition texts in 60 minutes.

Meanwhile, non-test data collecting technique was used in order to answer the fourth research question, that is, what the problems faced by the students were in analysing words through morphological analysis. It consisted of observation and interview as follows:

3.4.3. Observation

Observation was used in this research to find out the qualitative data, that is, what the problems faced by students were in analysing words through morphological analysis. In this study, the researcher acted as a participant observer in collecting the data. On the one hand, she had observed the teaching-learning process concerning with the students' interest,

participation, and obstacle during the treatments to find out the possible problems while implementing morphological analysis teaching.

In addition, she also involved another observer to validate the data collected, that is, an English teacher at SMAN 9 Bandar Lampung. Most of that teacher's time was as non-participant observer (75% : 25%). That was because she did not join the class activities and observe the whole activities of the treatments conducted by the researcher.

3.4.4. Interview

The interview was also used in this research to find out the problems faced by students in analysing words through morphological analysis. The researcher employed the interview to some of the students in the experimental class as the representatives. In conducting the interview, the researcher used structured interview (Setiyadi, 2006). In structured interview, the researcher had set a list of the same questions to the students to find out what the problems faced by the students were in analysing words through morphological analysis. The researcher recorded and noted down the students' responses and it was done informally to get the authentic answers. Within that time, the students did not know they were being interviewed.

Furthermore, that interview was aimed at getting an accurate data not only from the researcher's and teacher's own observation but also from the students' opinion about teaching and learning process about morphological

analysis teaching. By analyzing the students' response and considering the observation result, the researcher was able to answer the fourth research question.

Given the data collecting techniques mentioned, consequently, there were four research instruments as follows.

- Test items of morphological analysis test
- Test items of reading comprehension test
- Observation Guide
- Interview Guide

Each research instrument could be seen in Appendices.

3.5. Try Out of the Research Instruments

The try-out was done to prove whether the test had good quality or not. There were four criteria of good test, that is, validity, reliability, level of difficulty, and discrimination power. That try-out of the instrument was divided into two, that is, try-out of morphological analysis test and try-out of reading comprehension test. Theoretically, to determine the quality of those tests, the researcher analyzed four criteria of good test as follows.

a. Validity

Validity refers to the extent to which the test measures what is intended to measure. A test can be said valid if the test measures the object to be measured and suitable for the criteria (Hatch, and Farhady, 1982: 251). In general, there are four kinds of validity as follows:

- Face validity, concerns with the lay out of the test;
- Content validity, depends on a careful analysis of the language being stated;
- Construct validity, measures certain specific characteristic in accordance with a theory of language learning;
- Criterion-related validity, concerns with measuring the success in the future as in replacement test.

In this study, the researcher used content validity and construct validity. Content validity emphasizes on the equivalent between the material that has been given and the items tested. Simply, the items in the test must represent the material that has been taught. To get the content validity of morphological analysis test, the researcher made a table of specification in order to judge whether the content validity was good or not.

Table 3.1 Table Specification of Morphological Analysis Try-out Test

No.	Morpological aspect	Items Number	Percentage
1.	Inflectional	8A, 14A, 2B, 5B, 11B, 12B	20%
2.	Prefix Derivational	2A, 6A, 9A, 10B, 13B	16.7%
3.	Circumfix Derivational	1A, 4A, 12A	10%
4.	Suffix Derivational	3A, 5A, 7A, 11A, 15A, 1B, 3B, 6B, 8B, 14B	33.3%
5.	Compound words	10A, 13A, 4B, 7B, 9B, 15B	20%
Total		30 items	100%

In addition, to get the content validity of reading comprehension test, the researcher tried to arrange the materials based on the basic competence in syllabus taken from Curriculum 2013 for second grade of senior high school students. Then, the objectives were modified that the students were able to identify main idea, make predictions, interpret problems/solutions, understand vocabulary, and make a generalization. Moreover, the researcher also made a

table of specification in order to judge whether the content validity was good or not.

Table 3.2 Table Specification of Reading Comprehension Try-out Test

No.	Reading Skills	Items Number	Percentage
1.	Identifying main idea	1, 7, 11, 16, 23, 28, 31, 36	20%
2.	Making predictions	2, 6, 8, 12, 13, 21, 26, 33, 38	22.5%
3.	Interpreting problems/solutions	5, 15, 19, 25, 29, 34, 40	17.5%
4.	Understanding vocabulary	4, 9, 14, 17, 20, 24, 30, 32, 35, 39	25%
5.	Making a generalization	3, 10, 18, 22, 27, 37	15%
Total		40 items	100%

(Suparman, 2012)

Furthermore, construct validity is concerned with whether the test is actually in line with the theory of what it means to know the language (Shohamy, 1985: 74). To make sure the test reflected the theory in reading comprehension, the researcher examined whether the test questions actually reflected the means of reading comprehension or not.

b. Reliability

Reliability refers to the extent to which the test is consistent in its score and gives us an indication of how accurate the test score are (Hatch and Farhady, 1982: 244). To know the reliability of the test, the researcher used Pearson Product Moment formula which measures the correlation coefficient of the reliability between odd and even number (reliability of half test) as follows:

$$r_l = \frac{\sum XY}{\sqrt{[\sum X^2][\sum Y^2]}}$$

where:

r_l : coefficient of reliability between odd and even numbers items

X : odd number

Y : even number

$\sum X^2$: total score of odd number items

$\sum Y^2$: total score of even number items

$\sum XY$: total score of odd and even number

After getting the reliability of half test, the researcher used *Spearman Brown's Prophecy Formula* (Hatch and Farhady, 1982: 247) to determine the reliability of the whole tests as follows:

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

where:

r_k : the reliability of the whole tests

rl : the reliability of half test

The criteria of reliability are as follows:

0.90 – 1.00 : high

0.50 – 0.89 : moderate

0.0 - 0.49 : low

(Hatch and Farhady, 1982: 247)

c. Level of Difficulty

Level of difficulty relates to how easy or difficult the item taken from the point of view of the students who take the test. It is important since test items which are too easy (that all students get right) can tell us nothing about differences within the test population (Shohamy, 1985: 79). The students were divided into

two groups that were upper and lower group. The students' scores were listed from the highest score to the lowest score. The level of difficulty was calculated by the following formula:

$$LD = \frac{U+L}{N}$$

where:

LD : level of difficulty

U : the number of upper group who answers correctly

L : the number of lower group who answers correctly

N : the total number of students in upper and lower groups

The criteria are as follows:

< 0.30 : difficult/needs revising

0.30 – 0.70 : average/good

> 0.70 : easy/needs revising

(Shohamy, 1985: 79)

d. Discrimination Power

Discrimination power refers to the extent to which the items are able to differentiate between high and low level students on that test. A good item according to this criterion is the one in which good students do well and bad students fail (Shohamy, 1985: 81). The discrimination power was calculated by this following formula:

$$DP = \frac{U-L}{1/2N}$$

Notes:

DP : discrimination power

U : the number of upper group who answers correctly

L : the number of lower group who answers correctly

N : the total number of the students in upper and lower groups

The criteria are:

DP = 0.00 – 0.19 = poor

DP = 0.20 – 0.39 = satisfactory

DP = 0.40 – 0.69 = good

DP = 0.70 – 1.00 = excellent

DP = negative/minus (-), all is poor

(Shohamy, 1985: 82)

Practically, the researcher used those formulas to know the quality of morphological analysis test items. Meanwhile, ITEMAN (Suparman, 2011) was used to determine the quality of reading comprehension test items to make it easier and more practical.

3.6. Results of the Try-out Test

The try-out test was conducted on January 8th, 2015 in class XI LM (Lintas Minat)

3. That test was administered to determine the quality of the instruments used in the research and also to decide which item should have been dropped and revised for the pretest and posttest. In the try-out test, the students were given two kinds of objective tests, that is, 30 essay test items of morphological analysis test and 40 items of multiple choice reading comprehension test with five optional alternative

answers (A, B, C, D, and E), one is the correct answer and the others are the distracters. The first test had been conducted in 20 minutes and the second one had been done in 60 minutes. Each result of the try out test will be elaborated as follows.

1. Result of Morphological Analysis-Try-out-Test

Based on the table in Appendix 5, there were 30 items in morphological analysis-try-out-test. After analyzing the criteria of a good test, that is, level of difficulty and discrimination power, the researcher found that 10 items had to be dropped (5A, 6A, 7A, 10A, 13A, 11B, 12B, 13B, 14B, and 15B) and 20 items could be administered for the pretest and the posttest with 13 good items (1A, 3A, 4A, 8A, 9A, 11A, 12A, 14A, 15A, 1B, 4B, 8B, and 9B) and 7 revised items (2A, 2B, 3B, 5B, 6B, 7B, and 10B).

The result of difficulty level in the try-out test consisted of 6 difficult items (4A, 5A, 7A, 11A, 14A, and 15A) which lied < 0.30 and showed that the items were difficult for the students; 16 easy items (2A, 6A, 10A, 13A, 1B, 3B, 5B, 6B, 7B, 9B, 10B, 11B, 12B, 13B, 14B, and 15B) which lied > 0.70 and showed that the items were easy for the students; and 8 average items (1A, 3A, 8A, 9A, 12A, 2B, 4B, and 8B) which lied between 0.30–0.70 and showed that the items were good for the students. The examples of difficult and easy test items were as follows.

Here is the example of the difficult test item:

A. Morphemes Identification Test (Analytic Aspect)
Please segment the following words into meaningful chunks!

5. spaciousness

That test item was on number 5A in morphological analysis try-out test. Its difficulty level showed 0.07, indicating that it was difficult for the students.

Here is the example of the easy test item:

A. Morphemes Identification Test (Analytic Aspect)

Please segment the following words into meaningful chunks!

10. nationwide

That test item was on number 10A in morphological analysis try-out test. Its difficulty level showed 1, indicating that it was easy for the students.

For the result of discrimination power in the try-out test, there were 13 poor items (2A, 5A, 6A, 7A, 10A, 13A, 2B, 7B, 11B, 12B, 13B, 14B, and 15B) which were negative and lied between 0.00–0.19 and showed the items could not discriminate between high and low level students; 12 satisfactory items (1A, 3A, 4A, 8A, 14A, 15A, 1B, 3B, 4B, 5B, 6B, and 9B) which lied between 0.20–0.39; and 5 good items (9A, 11A, 12A, 8B, and 10B) which lied between 0.40–0.69 and showed that they could discriminate between high and low level students. The example of poor test item was as follows.

A. Morphemes Identification Test (Analytic Aspect)

Please segment the following words into meaningful chunks!

13. eyebrow


That test item was on number 13A in morphological analysis try-out test. Its discrimination power showed 0.07, indicating that it was poor and could not discriminate between high and low level students.

Based on the result of the try-out test, there were 13 good items and 7 revised items and as a result, 20 items were administered for morphological analysis pretest and posttest. The same items were given in the pretest and the posttest but the number of the items in the pretest were changed randomly for the posttest. Those 13 good items had ‘average’ difficulty level and ‘satisfactory’/’good’ discrimination power. On the other hand, there were 10 items that had to be dropped because the difficulty level showed both easy and difficult and simultaneously the discrimination power was poor. Then, the researcher had decided there were 7 revised items. Generally, they were revised because either difficulty level or discrimination power showed average/satisfactory/good result. The elaboration of those revised items were as follows.

The first revised item was number 2A, prefix derivational aspect. From 5 items of that aspect, there was only one good item from that aspect. Thus, to make sure whether the students could understand this aspect, the researcher revised this item consisting of difficulty level belonging to ‘easy’ (0.96) and ‘poor’ discrimination power (0.07). The following was the revision of that test item.

A. Morphemes Identification Test (Analytic Aspect)

Please segment the following words into meaningful chunks!

2. refill  discourage

In accordance with the example above, the word *refill* had familiar root form *fill*, thus, it was easy to predict by the students as it belonged to ‘easy’ difficulty level. The researcher then improved its difficulty level by changing that familiar root form *fill* into the unfamiliar root form *courage*. Low level

students might have possibly predicted the root form *age* for that root and it showed it did not seem so easy for the students. On the contrary, the high level students were predicted to be able to analyze that root form correctly. In brief, that test item was predicted to have ‘average’ difficulty level and ‘satisfactory’ or ‘good’ discrimination power.

The second revised item was number 2B, inflectional aspect. From 6 items of that aspect, there were only two good items from that aspect. Thus, to make sure whether the students could understand this aspect, the researcher revised this item consisting of ‘average’ difficulty level (0.46) and ‘poor’ discrimination power (-0.31). The following was the revision of that test item.

B. Morphological Structure Test (Synthetic Aspect)

2. There is a **passer-by** near your house. Now, there are three of them.
So there are three _____.



2. This is a musical instrument called a **hux**. Now we have three of them.
These are three _____.

In line with the example above, those two test items had the same characteristic of difficulty level, that is, adding suffix *-s/-es* to the root form. Since the difficulty level had been average, the researcher focused on the discrimination power. From the result of the first test item, some of the students put the suffix *-s/-es* after *passer* and the rest put the suffix *-s/-es* after *by*. It was quite difficult to discriminate between high and low level students. Therefore, the researcher decided to change that test item into a word *hux* only. It could be predicted that the high level students would put *suffix -es* because that word ended by letter *x*, whereas the low level students would just simply put suffix

–s. In brief, that test item was predicted to have ‘average’ difficulty level and ‘satisfactory’ or ‘good’ discrimination power.

The third revised item was number 3B, suffix derivational aspect. That test item had ‘easy’ difficulty level (0.85) and ‘satisfactory’ discrimination power (0.31). Thus, the researcher focused more on how to make it into ‘average’ difficulty level by improving its difficulty level. The following was the revision of that test item.

B. Morphological Structure Test (Synthetic Aspect)

3. A soldier who **invades** foreign soil is an **invader**.
A person who **weaves** cloth is a _____.



3. Many soldiers **invaded** foreign soil. They were called **invaders**.
A person who **weaves** cloth is a _____.

According to the example above, the first test item was easy because the students just simply analyzed one transformation of a word *invades* into *invader*, changing suffix *–s* into suffix *–r*, thus, the word *weaves* into *weaver*. For the second revised item, the researcher made it more difficult by providing transformations of *invaded* in the past tense form into plural noun *invaders*, while the second clue of *weaves* that was in the present tense form had to be transformed into a singular noun *weaver*. Here, the students had to pay attention to more than one transformation of word and consider the subject of a sentence to decide whether it was singular or plural noun. In short, that test item was predicted to have ‘average’ difficulty level and ‘satisfactory’ or ‘good’ discrimination power.

The fourth revised item was number 5B, inflectional aspect. That test item had ‘easy’ difficulty level (0.81) and ‘satisfactory’ discrimination power (0.38).

Thus, the researcher focused more on how to make it into ‘average’ difficulty level by improving its difficulty level. The following was the revision.

B. Morphological Structure Test (Synthetic Aspect)

5. Joe knows how to **fleamp**. He is **fleamping** something.
He did the same thing yesterday. What did he do yesterday?
Yesterday he _____.



5. Look! Joe is **fleamping** something. He knows how to **fleamp**.
He does the same thing everyday. What does he usually do?
He usually _____.

Based on the example above, the first test item was easy because the students just simply put suffix *-ed* to the word *fleamp* to indicate what activity Joe did yesterday. For the second revised item, the researcher made it more difficult by changing the question of what Joe usually does everyday. Compared to past tense form, the students usually faced difficulty in forming present tense form because the subject of the sentence affected the transformation of a verb. If the subject was singular, the verb form had to be added by suffix *-s/-es*. That was the point that students usually forgot, adding suffix *-s/-es* when the subject was singular. Thus, that test item was predicted to have ‘average’ difficulty level and ‘satisfactory’ or ‘good’ discrimination power.

The fifth revised item was number 6B, suffix derivational aspect. That test item had ‘easy’ difficulty level (0.77) and ‘satisfactory’ discrimination power (0.31). Thus, the researcher focused more on how to make it into ‘average’ difficulty level by improving its difficulty level. The following was the revision of that test item.

B. Morphological Structure Test (Synthetic Aspect)

6. I am afraid he won't soon forget his **humiliation** because their mocking laughter **humiliated** him.

The long walk **exhausted** him. We noticed his _____ right away.



6. Their mocking laughter **has humiliated** him and I am afraid he won't soon forget his **humiliation**.

We noticed his _____ right away because the long walk **had exhausted** him.

Based on the example above, the first test item was easy because the students just simply analyzed one transformation of a word *humiliation* into *humiliated*, changing suffix *-ion* into suffix *-ed*, thus, the word *exhausted* into *exhaustion*. For the second revised item, the researcher made it more difficult by providing transformations of *has humiliated* in the present perfect tense form into noun *humiliation*, while the second clue of *had exhausted* that was in past perfect tense form had to be transformed into noun *humiliation* as well. The distracter of difficulty was in the transformation of *has humiliated* and *had exhausted*. Although they differed, the needed answer was still noun *exhaustion* and that was the point of difficulty the students had to consider. Thus, that test item was predicted to have 'average' difficulty level and 'satisfactory' or 'good' discrimination power.

The sixth revised item was number 7B, compound words aspect. From 6 items of that aspect, there were only two good items of that aspect. Thus, to make sure whether the students could understand this aspect, the researcher revised this item consisting of 'easy' difficulty level (0.92) and 'poor' discrimination power (0.15). The following was the revision of that test item.

B. Morphological Structure Test (Synthetic Aspect)

7. Many people wear laces on their **neck** called a **necklace**. Some people wear laces on their **foot**, what should we call that?

_____.



7. Some people wear rings on their **ears**, they are called **earrings**.
Some people wear a ring on their **nose**, what should we call that?

In line with the example above, the first test item was easy because the students just simply analyzed the transformation of *neck* into *necklace*, adding free morpheme *-lace*, thus, *foot* into *footlace*. The students from both low and high level students could do it. Seeing that, to make it more difficult and to be able to discriminate between high and low level students, the researcher revised the second item by providing the transformation *ears* into *earrings*, while the second clue *nose* into *nosering*. Here, the students had to pay attention whether the stated noun was singular or plural. If it was plural, the suffix *-s* was added and vice versa. That was the point of difficulty the students had to face. Sometimes, they forgot to put plural noun with suffix *-s*. On the other hand, high level students were supposed to be able to put that suffix *-s* on plural noun. In short, that test item was predicted to have ‘average’ difficulty level and ‘satisfactory’ or ‘good’ discrimination power.

The last revised item was number 10B, prefix derivational aspect. That test item had ‘easy’ difficulty level (0.73) and ‘good’ discrimination power (0.54). Thus, the researcher focused more on how to make it into ‘average’ difficulty level by improving its difficulty level. The following was the revision of that test item.

B. Morphological Structure Test (Synthetic Aspect)

10. If you **miscalculate** something, you wrongly **calculate** it.
If you incorrectly **judge** other, it means that you _____ him/her.



10. If you **miscalculate** something, that means you wrongly **calculate** it.
Fia and Nia incorrectly **judge** other. That means, Fia _____
him/her.

In accordance with the example above, the first test item was easy because the students just simply analyzed the transformation of *calculate* into *miscalculate*, adding prefix *mis-* before the root, thus, the word *judge* into *misjudge*. To make it more difficult, the researcher revised it by providing the transformation of *calculate* into *miscalculate* and *judge* into *misjudges*. Here, the students had to consider the subject of the sentence, that is, *she*. When the subject was singular, the transformation of verb form had to be added by suffix *-s*. That was the point of difficulty that the students sometimes forgot to add it. In brief, that test item was predicted to have ‘average’ difficulty level and ‘satisfactory’ or ‘good’ discrimination power.

Then, to find out the reliability of the test, the researcher used *Spearman Brown's Prophecy Formula* for morphological analysis test. Based on the statistical calculation, it was found that the reliability was 0.99 (see Appendix 6). According to the criteria of reliability proposed by Hatch and Farhady (1982), that test had high reliability because it lied between 0.90-1.00. Therefore, it could be indicated that morphological analysis test as one of the instruments in this research was reliable and good.

2. Result of Reading Comprehension Try-out Test

After analyzing the result of reading comprehension try-out test, the researcher found that there were 5 items which had to be dropped (1, 7, 12, 15, and 25) and 35 items could be administered for the pretest and posttest with 28 good items (2, 3, 5, 6, 8, 9, 10, 11, 13, 16, 17, 18, 21, 23, 24, 26, 27, 28, 29, 30, 31, 32, 33, 34, 36, 37, 38, and 40) and 7 revised items (4, 14, 19, 20, 22, 35, and 39) (see Appendix 12).

The result of difficulty level in the try-out test consisted of 2 difficult items (7 and 39) which lied between 0.100-0.299 and showed that the items were difficult for the students; 6 easy items (4, 12, 19, 22, 27, and 38) which lied between 0.701-0.900 and showed that the items were easy for the students; 4 very easy items (1, 14, 15, and 25) which lied between 0.901-1.000 and showed that the items were very easy for the students; and 28 average items (2, 3, 5, 6, 8, 9, 10, 11, 13, 16, 17, 18, 20, 21, 23, 24, 26, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, and 40) which lied between 0.300–0.700 and showed that the items were good for the students. The examples of difficult, easy, and very easy items were as follows.

Here is the example of the difficult test item:

39. "...and laden with *unrecognizable* ingredients." (paragraph 1)
The italicized word is best replaced by...
- A. various
 - B. well-known
 - C. indistinguishable
 - D. additional
 - E. favorable

That test item was on number 39 in reading comprehension try-out test. Its difficulty level showed 0.23, indicating that it was difficult for the students.

The following is the example of the easy test item:

12. What can you predict when pesticides affect bees and fish?
- That will reduce the quality of farm products.
 - The chemicals in the pesticides will be absorbed in the soil.
 - The ecology and environment will be affected.
 - The chemicals in the pesticides may build up as residues in the environment.
 - The newer and stronger pesticides have to be developed.

That test item was on number 12 in reading comprehension try-out test. Its difficulty level showed 0.85, indicating that it was easy for the students.

The following is the example of very easy test item:

14. "...but many others are too *addicted* to quit." (paragraph 1)
The italicized word means ...
- able to stop to do something
 - reluctant to do something
 - willing to stop something
 - unable to stop something
 - worried to do something

That test item was on number 14 in reading comprehension try-out test. Its difficulty level showed 1, indicating that it was very easy for the students.

For the result of discrimination power in the try-out test, there were 9 very low items (4, 7, 11, 12, 14, 15, 20, 35, and 39) which lied ≤ 0.199 and showed the items were very low to discriminate between high and low level students; 10 low items (10, 19, 22, 25, 28, 31, 33, 34, 36, and 37) which lied between 0.200–0.299 and showed that the items were low and still could not discriminate between high and low level students; 8 quite average items (1, 5, 16, 18, 21, 24, 27, and 30) which lied between 0.300–0.399; and 12 high items (2, 3, 8, 9, 13, 17, 23, 26, 29, 32, 38, and 40) which lied ≥ 0.400 and showed the items were very good to dicriminate between high and low level students.

The examples of very low and low test items were as follows.

Here is the example of very low test item:

15. As a serious social problem, what has the government done relating to smoking?
- A. The government has permitted cigarette with low tar.
 - B. The government has warned the danger of smoking.
 - C. The government has conducted a research in California.
 - D. The governments has estimated a number of toxic materials in cigarettes.
 - E. The government has agreed that smoking can raise inspiration.

That test item was on number 15 in reading comprehension try-out test. Its discrimination power showed -0.15, indicating that it was very low to discriminate between high and low level students.

The following is the example of low test item:

19. According to the passage above, what is the problem faced by the addicted smokers?
- A. They smoke just to socialize with others.
 - B. They are not allowed to smoke cigarettes with high tar.
 - C. They are never satisfied with one cigarette.
 - D. They will be neglected by their surroundings.
 - E. They are able to stop smoking easily.

That test item was on number 19 in reading comprehension try-out test. Its discrimination power showed 0.28, indicating that it was low to discriminate between high and low level students.

Based on the result of the try-out test, there were 35 items with 28 good items and 7 revised items in which five items from understanding vocabulary aspect were revised to know whether the students were able to overcome those questions by morphological analysis or not. Hence, 35 items were administered for reading comprehension pretest and posttest. The same items were given in the pretest and the posttest but the number of the items and arrangement of the texts in the pretest were changed randomly for the posttest. Those 28 good items had 'good' difficulty level and 'quite average'/'high' discrimination power. On the other hand, there were 5 items that had to be dropped because

the difficulty level showed difficult/very easy/easy and simultaneously the discrimination power was very low/low. Then, the researcher had decided there were 7 revised items. Generally, they were revised because either difficulty level or discrimination power showed average/satisfactory/good result. The elaboration of those revised items were as follows.

The first revised item was number 4, understanding vocabulary aspect. From 10 items of that aspect, there were only five good items of it. Thus, to make sure whether the students were able to overcome that question by morphological analysis or not, the researcher revised this item. It consisted of 'easy' difficulty level (0.88) and 'very low' discrimination power (0.03) and that indicated the item needed revising.

Based on the result of the test item number 4, the meaning of phrase 'should not be banned' was easy for the students to analyze. Thus, the researcher revised it by changing that phrase into the other morphologically complex word, that is, *conclusive* to make it more difficult for the students to analyze. That word could be analyzed by breaking it down into a root *conclusion* and suffix *-ive*. When the students had known that word related to the word *conclusion*, they might have been able to predict the opposite meaning of that word. The researcher also changed the alternative answers consisting of five morphological complex words. They were *obviously*, *unquestionable*, *clearly*, *undeniable*, and *ambiguous*.

The second revised item was number 14. It was also understanding vocabulary aspect. The consideration for revising this item was just because the researcher

would like to see whether the students were able to overcome that question by morphological analysis or not. This test item had ‘very easy’ difficulty level (1) and ‘very low’ discrimination power (0) and that indicated the item needed total revising. Seeing that, the researcher revised that item by changing the word *addicted* into the other morphologically complex word ‘undoubtedly’ to make it more difficult for the students to analyze. That word could be analyzed by breaking it down into a root *doubt*, prefix *un-*, and suffixes *-ed*, *-ly*. When the students had known that word related to the word *doubt*, they might have been able to predict the synonym of that word. The researcher also changed the alternative answers consisting of five morphologically complex words. They were *probably*, *importantly*, *implicitly*, *definitely*, and *partially*.

The third revised item was number 19, interpreting problems/solutions aspect. It was revised because it had ‘easy’ difficulty level (0.73) and ‘low’ discrimination power (0.28) and that indicated the item needed revising. Therefore, the researcher changed the alternative answers based on the general possible problems faced by the addicted smokers and all the options could be suitable as the answer. However, the students had to read the text carefully because the problem asked was based on the passage.

The fourth revised item was number 20, understanding vocabulary aspect. The reason for revising this item was the same as the reason for the first and second revised items. This item had ‘good’ difficulty level (0.42) and ‘very low’ discrimination power (0.01) and that indicated the item needed total revising. Therefore, the researcher changed the word ‘substances’ into ‘notified’ to make

it more morphologically complex form so that the students were able to analyze it by using morphological analysis.

The fifth revised item was number 22, making a generalization aspect. It was revised because it had 'easy' difficulty level (0.81) and 'low' discrimination power (0.22) and that indicated the item needed revising. Therefore, the researcher changed the alternative answers based on the statements stated on the text. However, the students had to read the text carefully and considered one thing that could be true for all the things and in all cases as the answer of the generalization aspect.

The sixth revised item was number 35, understanding vocabulary aspect. The reason for revising this item was the same as the reason for the first, second, and fourth revised items. This item had 'good' difficulty level (0.69) and 'very low' discrimination power (0.14) and that indicated the item needed total revising. Therefore, the researcher changed the phrase 'laden with' into a morphologically complex word *instantaneous* so that the students were able to analyze it by using morphological analysis. When the students had known that word related to the word *instant*, they might have been able to predict the antonym of that word. The researcher also changed the alternative answers consisting of five morphologically complex words. They were *unhurried*, *briefly*, *sudden*, *produced for*, and *limited to*.

The last revised item was number 39, understanding vocabulary aspect. The reason for revising this item was the same as the reason for the first, second, fourth, and fifth revised items. This item had 'difficult' difficulty level (0.23)

and ‘very low’ discrimination power (0.13) and that indicated the item needed total revising. Therefore, the researcher changed the word *unrecognisable* into the other easier morphologically complex word *unnecessarily* so that the students were able to analyze it by using morphological analysis. When the students had known that word related to the word *necessary*, they might have been able to predict the antonym of that word. The researcher also changed the alternative answers consisting of five morphologically complex words. They were *basically*, *unrecognizably*, *needlessly*, *essentially*, and *extremely*.

Then, to find out the reliability of reading comprehension try-out test, the researcher used ITEMAN (Suparman, 2011). Based on the result of ITEMAN analysis, it was found that the reliability (Alpha) was 0.726 (see Appendix 13), indicating that it had high reliability because it lied between 0.701-1.000.

3.7. Research Procedures

The researcher used the following procedures in order to collect the data:

1. Determining the research problem

The main problem of this research was whether teaching morphological analysis would give a positive effect on the students’ reading comprehension achievement or not.

2. Determining population and sample

The population of this research was the second grade of SMAN 9 Bandar Lampung students in 2014/2015 academic year and the sample was chosen randomly. The researcher took two classes, the first one was the experimental class and the second one was the try-out class.

3. Selecting the material

The material of this research was hortatory exposition text based on Curriculum 2013 for senior high school students at the second grade.

4. Administering the try-out test

This test was conducted before the pretest was administered and was intended to determine the quality of the test used as the instrument of the research and to determine which item should have been revised or dropped for the pretest and the posttest. This test consisted of 15 items of Morphemes Identification Test (Analytic Aspect), 15 items of Morphological Structure Test (Synthetic Aspect), and reading comprehension test taken from hortatory exposition text comprised of 40 items of multiple choices with five options and one of them is as the correct answer.

5. Administering the pretest

The pretest was administered in order to find out the students' morphological analysis and reading comprehension entry point before they were given the treatments in the experimental class. This test also consisted of Morphemes Identification Test (Analytic Aspect), Morphological Structure Test (Synthetic Aspect), and reading comprehension of multiple choice test taken from hortatory exposition text. Each test item could be determined after the try-out test had been administered. From that try-out test, the researcher could know which items of the test should have been taken, revised, and dropped for the pretest. Morphological analysis pretest had been conducted in 20

minutes while reading comprehension pretest had been conducted in 60 minutes.

6. Conducting treatments

In this research, the treatments were conducted in three meetings which took 2 x 45 minutes for every meeting in the experimental class. There were three lesson plans for each meeting. For the first meeting, the researcher gave hortatory exposition text to the students. Then, the researcher chose some words from the text consisting of frequent prefixes and some suffixes forms. The researcher began to introduce them and discuss the meaning of words consisting of prefixes and some suffixes forms. Besides, compound words as the element in morphological analysis was introduced. For the second and third meeting, the researcher introduced and discussed more about the other forms of frequent suffixes usually encountered in reading text. For every meeting, the researcher had also introduced how the words were transformed using prefixes and suffixes, such as from noun to adjective or vice versa.

7. Conducting observation

Observation was done simultaneously while the researcher was conducting the treatments. The researcher observed the students' interest in teaching learning activity while conducting morphological analysis teaching, the way the students participated in that activity, and the obstacles faced by them. Observation sheet, in the form of a check list, was used to observe those things. Definitely its purpose was to find out what the problems faced by students were in analysing words through morphological analysis.

8. Administering posttest

This test was conducted in order to find out the students' morphological analysis and reading comprehension achievement after they had some treatments. That test consisted of Morphemes Identification Test (Analytic Aspect), Morphological Structure Test (Synthetic Aspect), and reading comprehension of multiple choice test taken from hortatory exposition text. Each test item could be determined after the try-out test had been administered. From that try-out test, the researcher could know which items of the test should have been taken, revised, and dropped for the posttest. Morphological analysis posttest had been conducted in 20 minutes while reading comprehension posttest had been administered in 60 minutes.

9. Administering Interview

The researcher interviewed some of the students as the representatives in the experimental class after doing the posttest. The purpose of the interview was to get an accurate data not only from the researcher's and teacher's own observation but also from the students' opinion about teaching and learning process about morphological analysis teaching. That was done to decide what the problems faced by the students were in analysing words through morphological analysis.

10. Analyzing the data

The last but not least step of the research was analyzing the data. In this step, the researcher drew conclusion from the tabulated results of the pretest and the posttest that had been administered.

Those ten things, starting from determining the research problem until analyzing the data, were the whole procedures in administering this research.

3.8. Scoring System

There were two different tests in this research. Those two tests belonged to objective test because there was only one single correct answer for every test item. To score the first test, that is, morphological analysis test, the researcher gave one point for every right answer of the test item. Take an example, in Morphemes Identification Test (Analytic Aspect), the students were asked to segment the words into their meaningful chunks. If they segmented one of the chunks of the word incorrectly, they did not get any point. But if they were able to segment every chunks of the word correctly, they could get one point. Therefore, to know the students' results of morphological analysis test, the students' right answers were divided by the total items and multiplied by 100 as in Henning's formula.

Furthermore, to get the score of the students' reading comprehension result of the test, the researcher also employed Hennings's formula. The ideal highest score is 100. Each score of the pretest and the posttest was calculated by using the following formula:

$$PS = \frac{R}{N} \times 100$$

Notes:

PS : Percentage Score

R : the total of right answer

N : total item

(Henning, 1987)

3.9. Data Analysis

As the data collected in this study were both quantitative and qualitative, the researcher analyzed the data into statistical analysis and qualitative way of data analysis. To answer the first, second, and third research question concerning with whether there was a difference on both the students' morphological analysis achievement and reading comprehension achievement before and after being taught through morphological analysis teaching and whether teaching morphological analysis would result in the positive effect on the students' reading comprehension achievement, the researcher analyzed the statistical analysis by doing the following steps:

1. Scoring the pretest and posttest

The pretests and posttests in this study consisted of morphological analysis test and reading comprehension test. Each score of the pretest and posttest was then calculated.

2. Tabulating the result of the test and calculating the mean of the pretest and posttest.

Since there were two tests in this research, that is, morphological analysis test and reading comprehension test, the means of morphological analysis pretest and posttest were firstly calculated. The means of reading comprehension pretest and posttest were also calculated. Those means were calculated by applying the following formula:

$$\bar{X} = \frac{\sum x}{N}$$

Notes:

\bar{X} : mean

$\sum x$: the total number of the students score

N : number of students

(Hatch and Farhady: 1982)

3. Calculating the significant difference of the test by comparing the means of the pretest and posttest.

To know whether teaching morphological analysis could result in the positive effect on the students' reading comprehension achievement, the researcher firstly analyzed the difference of morphological analysis test from the pretest to the posttest. In order to know that difference, the formula was as follows:

$$I = \bar{X}_2 - \bar{X}_1$$

Notes:

I : the increase of the students' morphological analysis achievement

\bar{X}_2 : the average score of posttest (morphological analysis)

\bar{X}_1 : the average score of pretest (morphological analysis)

Then the data were analyzed by using *Repeated Measure T-test* in order to know the significance of the treatments effect. The formula is:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{S_{\bar{D}}}$$

in which: $S_{\bar{D}} = \frac{SD}{\sqrt{N}}$

$$SD = \sqrt{\frac{\sum D^2 - (1/n) - (\sum D)^2}{n-1}}$$

Notes:

$S_{\bar{D}}$: standard error between two means

SD : standard deviation

- n : number of students
 X_1 : arithmetical mean of pretest
 X_2 : arithmetical mean of posttest
 N : number of students
 t : test

(Hatch and Farhady: 1982)

After doing those steps, the significant difference of morphological analysis test was revealed. It could be seen from the mean score in the posttest which was higher than that of in the pretest. That meant there was a significant progress of the students' morphological analysis achievement. The researcher used that progress as a proof that there had been morphological analysis teaching to the students and that kind of teaching had affected the students' morphological analysis achievement. Then to investigate whether morphological analysis teaching could result in the positive effect on the students' reading comprehension achievement, the researcher analyzed the difference of the reading comprehension test from the pretest to the posttest. The formula is also as follows:

$$I = \overline{X_2} - \overline{X_1}$$

Notes:

I : the increase of the students' reading comprehension achievement

$\overline{X_2}$: the average score of posttest (reading comprehension)

$\overline{X_1}$: the average score of pretest (reading comprehension)

Furthermore, the data were analyzed by using *Repeated Measure T-test* in order to know the significance of the treatments effect. The formula is:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{S_{\bar{D}}}$$

in which: $S_{\bar{D}} = \frac{SD}{\sqrt{N}}$

$$SD = \sqrt{\frac{\sum D^2 - (1/n) - (\sum D)^2}{n-1}}$$

Notes:

$S_{\bar{D}}$: standard error between two means

SD : standard deviation

n : number of students

X_1 : arithmetical mean of pretest

X_2 : arithmetical mean of posttest

N : number of students

t : test

(Hatch and Farhady: 1982)

Practically, the researcher used *Repeated Measure T-test* computed through SPSS version 16.0 to analyze the data.

4. Drawing conclusion from the data.

To make a conclusion of whether teaching morphological analysis would result in the positive effect on the students' reading comprehension achievement, the researcher firstly analyzed the difference in the students' morphological analysis achievement. When there was a significant difference that the students' mean score in the posttest was higher than that of in the

pretest, that meant there was a progress of the students' morphological analysis achievement. If there was a progress, the researcher could analyze the difference of the students' reading comprehension achievement. If both of them showed any progress, that meant morphological analysis teaching had affected the students' reading comprehension achievement positively. On the contrary, if there was no difference and progress on the students' morphological analysis achievement, that meant morphological analysis teaching did not affect the students' reading comprehension achievement.

To answer the fourth research question, the researcher used Descriptive Analysis. It was used to describe the problems faced by the students in analysing words through morphological analysis. It had been done by analysing the researcher's and the teacher's observation and also the students' responses in the interview that had been conducted. The researcher provided an analysis of the data by using the steps proposed by Setiyadi (2006) as follows:

1. Making abstraction of the collected data to be treated in one unit. The researcher interpreted all data available by selecting them into an abstraction.
2. Identifying the data based on the research question.
3. Categorizing the data based on the research question.
4. Interpreting the data which belong to the problems faced by the students in analysing words through morphological analysis.

3.10. Hypothesis Testing

The pretest and the posttest results of morphological analysis test and reading comprehension test were compared in order to know the gain. The researcher used

Repeated Measure T-test computed through SPSS version 16.0 towards the average scores of the pretest and posttest. Moreover, the result of t-test was used to investigate the difference on the students' morphological analysis achievement and reading comprehension achievement before and after the treatments and to prove whether the proposed hypotheses were accepted or rejected. The researcher used significant level of 0.05 in which that the probability of error in the hypothesis was only about 5%.

Concerning with the first research question, the hypotheses were drawn as follows:

H₀₁: There is no significant difference on the students' morphological analysis achievement before and after being taught through morphological analysis teaching.

H₁: There is a significant difference on the students' morphological analysis achievement before and after being taught through morphological analysis teaching.

(Hatch and Farhady, 1982)

The criteria for accepting the hypotheses are as follows:

1. H₀₁ is accepted if the t-value is lower than T-table.
2. H₁ is accepted if the t-value is higher than T-table.

Concerning with the second research question, the hypotheses were drawn as follows:

H₀₂: There is no significant difference on the students' reading comprehension achievement before and after being taught through morphological analysis

teaching.

H₂: There is a significant difference on the students' reading comprehension achievement before and after being taught through morphological analysis teaching.

(Hatch and Farhady, 1982)

The criteria for accepting the hypotheses are as follows:

1. H₀₂ is accepted if the t-value is lower than T-table.
2. H₂ is accepted if the t-value is higher than T-table.

Since an effect was indicated with a difference in the result of teaching morphological analysis on the students' reading comprehension achievement before and after the treatments and the posttest score is better than the pretest one, therefore, in accordance with the hypotheses above, if H₀₂ is accepted, it means the following H₀₃ is also accepted.

H₀₃: There is no effect of teaching morphological analysis on the students' reading comprehension achievement.

In contrast, if H₂ is accepted, the following H₃ is also accepted.

H₃: There is a positive effect of teaching morphological analysis on the students' reading comprehension achievement.

This is the end of the discussion in this chapter. The research methods of this research, starting from research design until hypothesis testing, have been all discussed. Then, the next chapter will discuss the results of the data analysis and discussions.