III. METHODS OF RESEARCH

A. Research Design

The objective to be achieved in this research is to find out the possibility that there might be significant correlation between students' ability in inferring word meaning from context toward their achievement on reading comprehension. To gain this objective above, the researcher conducted quantitative research by using ex post facto design. Hatch and Farhady (1982: 26) state that:

> Ex post facto design is often used when the researcher does not have control over the selection and manipulation of the independent variable. This is why the researchers look at the type and/or degree of relationship between two variables rather than at a cause-and-effect relationship.

The data of this study are students' ability in inferring word meaning from context and achievement on reading comprehension. Inferring word meaning from context that was tested is symbolized as 'X' variable. Reading comprehension is one of the language skills that was tested and the result is students' reading comprehension achievement symbolized as 'Y'. This is illustrated as follows:

X Y

X = inferring word meaning test

Y = reading comprehension test

(Hatch & Farhady, 1982:26)

To find the coefficient correlation between students' ability in inferring word meaning from context and their achievement on reading comprehension, the researcher used Pearson Product Moment Correlation. While to analyze how far the contribution of students' ability in inferring word meaning from context and their achievement on reading comprehension, the wrier used Simple Regression.

B. Population and Sample

The population of this research was the first year students of SMA Negeri 1 Kibang, East Lampung. There were five classes of the first year students with the total number of 157 students. According to Arikunto (2002: 107), if a number of samples are more than 100, it is suggested to take 10-15% or 20-25% of the samples. The selection of the sample was done through probability sampling, by using simple random sampling, where every individual in population had probability to be chosen as sample. The researcher took 8 students for each class to be chosen as sample by using lottery. The use of this method was to fulfill the external validity aspect and to get normal distribution data. Therefore, the total number of sample was 40 students.

C. Research Instruments

To collect the data, researcher used score of students' ability in inferring word meaning from context and their reading comprehension test score. Both tests of inferring word meaning from context and reading comprehension used in this

study are the objective test in the form of multiple choices. The researcher used this kind of the test because the scoring could be done quickly and no judgment was involved. Each of the correct items was scored 1 and for the item that was incorrectly answered was scored 0. Then the score for each test was changed to the scale of 1-100. It was based on Arikunto's formula in which the ideal higher score was 100. The scoring system formula was as follows:

$$S = \frac{R}{N} 100$$

Where:

S : the score of the test

R : the total of the correct answer

N : the total items

1. Test of Inferring Word Meaning from Context

The test was particularly aimed at discovering the students' achievement in inferring word meaning from context in which they were required to choose one of the words that best define the target words (bold) presented in the sentence and paragraph.

In the test of inferring word meaning from context, the researcher gave 30 items and it was administered in 60 minutes. The items were selectively adapted from several sources; Longman Preparation Course for the TOEFL test, Linked to the

World 1 English for Senior High School Students Grade X, and Steps to Academic Reading 5 (see Appendix 2)

Table 1. Table of Specification of Inferring Word Meaning from Context Test

No.	Part of Speech	Item Numbers	Percentage
1	Noun	2, 4, 8, 15, 21, 27	20%
2	Verb	5, 7, 10, 11, 14, 29	20%
3	Adjective	1, 3, 9, 13, 17, 28	20%
4	Adverb	6, 16, 19, 23, 25, 30	20%
5	Prepositional Phrases	12, 18, 20, 22, 24, 26,	20%
Total		**30**	**100%**

2. Test of Reading Comprehension

The test of reading comprehension was intended at describing students' achievement on reading comprehension. The test was valid because the whole questions of the test are related enough to reading comprehension test. It was administered for 30 items in 60 minutes. There were 30 items of multiple choices with four options and one of them was as the correct answer. The total score was 100 point; therefore, if the students answer the whole questions correctly they get 100 point. The items were adapted from worksheet and textbook; Linked to the World 1 English for Senior High School Students Grade X. (See Appendix 3)

The researcher specified the aspects to be tested as in the table of specification as follows:

Table 2. Table of Specification of Reading Comprehension Test

No.	Skills of Reading	Item Numbers	Percentage
1	Main Idea	1, 5, 11, 14, 17, 24,	20%
2	Supporting Detail	6, 7, 10, 18, 27, 29	20%
3	Inference	4, 9, 12, 15, 21, 26	20%
4	Reference	3, 13, 16, 19, 23, 28	20%
5	Vocabulary	2, 8, 20, 22, 25, 30	20%
Total		**30**	**100%**

D. Validity and Reliability of the Instruments

1. Validity

A test is said to be valid if it measures accurately what is intended to measure (Hugher, 1991: 22). There are four kinds of validity, namely face validity, content validity, construct validity, and empirical or criterion-related validity. To measure whether the test has a good validity, the researcher used content and construct validity.

a. Content Validity

Content validity is the extent to which the test measures a representative sample of the subject matter content. The focus of the content validity is adequacy of the sample and not simply on the appearance of the test (Hatch and Farhady, 1982: 251).

b. Construct Validity

The purpose of construct validity is to examine whether the test is a good representation of the material that needs to be tested (Shohamy, 1985: 75). It means that the test is a good reflection of what has been taught and of the knowledge which the researcher wants the students to know.

A test, a part of a test, or a testing technique is said to have construct validity if it can be demonstrated that it measures just the ability which is supposed to be measured. The word 'construct' refers to any underlying ability (or trait) which is hypothesized in a theory of language ability (Hughes, 1991: 26).

One of the researcher's efforts to achieve validity is to construct the instruments based on the topic that is suitable with the syllabus of first year students and the table of specification that outlines the content and the aspects of inferring word meaning and reading comprehension skill. (see Table 1. and Table 2)

2. Reliability

Reliability is a measure of accuracy, consistency, dependability or fairness of scores resulting from administration of particular examination. Hatch and Farhady (1982: 243) state that the reliability of a test can be defined as the extent to which a test procedures consistent result when administered under similar condition.

Therefore, to estimate tests reliability the researcher used Cronbach Alpha, that was measured based on the average questions correlation and estimated using the following formula based on item variances:

$$\text{Cronbach's } \alpha = \frac{k}{(k-1)}\left[1 - \frac{\sum \text{var}(i)}{\text{var}(sum)}\right]$$

where

k : the number of items

$\text{var}(i)$: the variance of an item

$\text{var}(sum)$: the variance of the totals for each participant

A slightly different Cronbach's alpha called the standardized Cronbach's alpha can also be applied under the assumption that the items are measuring the same underlying dimension on the same scale and therefore should have the same variance. The calculation is based on the inter-item correlations rather than on item variances:

$$\text{Standardized Cronbach's } \alpha = \frac{k\bar{r}}{1 + \bar{r}(k-1)}$$

where

k : the number of items

$\bar{r}$: the average inter-item correlation

The question is whether the measured alpha values signify acceptable reliability. Tuckman (1999) distinguishes between instruments that measure a univariate quantity, such as a test of knowledge of a subject area or mastery of a particular skill, and instruments that measure preferences or attitudes. In tests of the former type, a high level of proficiency in the subject area or skill being assessed should lead to correct responses to most items and a low level of proficiency should lead to mostly incorrect responses, so that a high level of correlation among the items on the scale and hence a high Cronbach alpha would be expected. On the other hand, if the assessed preferences are dependent and may vary in strength from one individual to another (as learning style preferences do), a lower correlation among the items related to that preference would be anticipated; indeed, a very high correlation would suggest that the items are not assessing independent aspects of the preference but are simply reworded variants of the same question. In light of these considerations, Tuckman (1999) suggests that an alpha of 0.75 or greater is acceptable for instruments that assess knowledge and skills and 0.50 or greater is acceptable for attitude and preference assessments such as learning styles. Every item in inferring word meaning from context test and reading comprehension test was analyzed to make sure that the items consist of good unity. The reliability

criteria range from 0.90 to 1.00 indicating high reliability, from 0.50 to 0.89 indicating moderate reliability, and from 0.00 to 0.49 indicating low reliability (Hatch and Farhady, 1985:247).

Based on the calculation of reliability analysis for inferring word meaning from context test, alpha is 0.810 (see Appendix 4). It means that the instrument of inferring word meaning from context test has moderate reliability. It can be interpreted that the instrument is proper to be used for a research. The analysis of each item showed that if the item deleted, it will make alpha lower. For example, Item 1 on column of "cronbach's alpha if item deleted" column (see Appendix 5), the alpha is 0.806. It means that, if item 1 deleted, alpha will be lower than 0.810. The higher the alpha is the better the test instrument is.

Another example, Item 2 of "cronbach's alpha if item deleted" column, the alpha is 0.805. Alpha of this item (0.805) did not make the alpha of coefficient reliability (0.810) increased if this item is deleted. With alpha 0.810, the researcher reported that this inferring word meaning from context test has significant reliability and reliable to be administered.

While the calculation of reliability analysis for reading comprehension test, alpha is 0.790 (see Appendix 4). By referring to the criteria of the reliability above, it means that the instrument of reading comprehension test has moderate reliability. It can be interpreted that the instrument is proper to be used for a research. The analysis of each item showed that if the item deleted, it will make alpha lower. For

example, Item 1 on column of "cronbach's alpha if item deleted" column (see Appendix 6), the alpha is 0.777. It means that, if item 1 deleted, alpha will be lower than 0.790. The higher the alpha is the better the test instrument is.

Another example, Item 2 of "cronbach's alpha if item deleted" column, the alpha is 0.786. Alpha of this item (0.786) did not make the alpha of coefficient reliability (0.790) increased if this item is deleted. With alpha 0.790, the researcher reported that this inferring word meaning from context test has significant reliability and reliable to be administered.

E. Difficulty Level and Discrimination Power of the Instruments

1. Difficulty Level

To see the level of difficulty, the researcher used the following formula:

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

Where:

LD : level of difficulty

U : the number of upper students who have given correct answers

L : the number of lower students who have given correct answers

N : the total number of the students who have taken part in the test

The criteria are;

< 0.30 : difficult

0.30 – 0.70 : average

> 0.70 : easy

(Shohamy, 1985: 79)

The results of the difficulty level for inferring word meaning from context test are available on Appendix 10. Based on the criteria above, inferring word meaning from context test consisted of eight easy items (1, 7, 8, 10, 20, 23, 24, 27), one difficult items (14) and the rest items (twenty one items) were average in the level of difficulty. The result is shown in the table below, which summarizes the difficulty level of inferring word meaning from context test items.

Table 3. Difficulty Level of the Inferring Word Meaning from Context Test Items

No.	Item Number	Value Range	Criteria
1	14	< 0.30	Difficult
2	2, 3, 4, 5, 6, 9, 11, 12, 13, 15, 16, 17, 18, 19, 21, 22, 25, 26, 28, 29, 30	0.30-0.70	Average
3	1, 7, 8, 10, 20, 23, 24, 27	> 0.70	Easy

While in reading comprehension test, the results of the difficulty level for reading comprehension test are also available on Appendix 11. It consisted of sixteen easy items (2, 4, 6, 7, 8, 10, 12, 15, 17, 18, 21, 24, 25, 27, 29, 30) and the rest items (fourteen items) were average in the level of difficulty. The result is shown in the table below, which summarizes the difficulty level of reading comprehension test items.

Table 4. Difficulty Level of Reading Comprehension Test Items

No.	Item Number	Value Range	Criteria
1	-	< 0.30	Difficult
2	1, 3, 5, 9, 11, 13, 14, 16, 19, 20, 22, 23, 26, 28	0.30-0.70	Average
3	2, 4, 6, 7, 8, 10, 12, 15, 17, 18, 21, 24, 25, 27, 29, 30	> 0.70	Easy

2. Discrimination Power

To see the discrimination power, the researcher used the following formula:

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

Where:

DP : discrimination power

U : the proportion of the upper group students

L : the proportion of the lower group students

N : total number of the students

The criteria are:

a. If the result is positive, it means the number of high students who have given correct answers is more than the number of low students who have given correct answers. But if the result is zero, it means there is no discrimination.
b. If the result is negative, it means there are more low students who have given correct answers than high students.
c. In general, the higher the discrimination index, the better. In classroom situation most items should be higher than 0.20 indexes.

(Shohamy, 1985: 81)

The results of the discrimination power for inferring word meaning from context test and reading comprehension test are available on Appendix 10 and 11. Based on the criteria above, calculation discrimination power indicates inferring word meaning from context test consisted of one poor item (8) and the rest items (twenty nine items) were good in discrimination power. While in reading comprehension test, it consisted of thirty good items in discrimination power.

F. Data Treatment

The researcher used the procedures to treat the data as follows:

1. Normality Test

Normality test is used to test whether the data has normal distribution. According to Setiyadi (2006: 168:169), one of the assumptions should be fulfilled in using T-test is that the data should have a normal distribution.

The criteria are as follows:

H_0 : the data is distributed normally

H_1 : the data is not distributed normally

In this research, H_0 would be accepted if Sign>α and the researcher used the level of significant 0.05. Based on the result (see Appendix 8), we can see that the classes gave sign > α. Therefore, it proved that H_0 was accepted and the whole data were distributed normally.

2. Random Test

Random test is used to ensure whether the data is random or not, as stated by Setiyadi (2006: 168-169), one of the assumptions should be fulfilled in using T-test is that the data should be taken from random sample in a population.

The criteria are as follows:

H_0 : the data is random

H_1 : the data is not random

In this research, H_0 would be accepted if Sign>α and the researcher used the level of significant 0.05. Based on the result (see Appendix 9), we can see that the classes gave sign > α. Therefore, it proved that H_0 was accepted and the whole data were random.

G. Research Procedure

In conducting the research, researcher used the steps as follows:

1. Determining the sample of population

   The researcher took the first year students at SMA Negeri 1 Kibang, East Lampung as the sample in this study. There were 5 classes consist of 30 to 35 students. The researcher took 8 students in each class to become sample.

2. Preparing the test of inferring word meaning from context

   The test consisted of 30 items of multiple choices. The students were required to choose one of the words that best defines the target words (bold) presented in the sentence and paragraph.

3. Preparing the test of reading comprehension.

   The test consisted of four texts with 30 items of multiple choices with four options and one of them was as the correct answer.

4. Administrating the test of inferring word meaning from context

   The researcher gave the test of inferring word meaning from context to the students. It was administered in 60 minutes.

5. Administrating the test of reading comprehension

   The researcher gave the test of reading comprehension. It was administered in 60 minutes.

6. Collecting the data

   After administering the test, the data from both tests was collected.

7. Analyzing the data

   The data was analyzed by using Statistical Package for Social Science (SPSS) version 18. to investigate whether there is any significant correlation or not.

H. Data Analysis

The research has two variables, dependent and independent. Since this research was a correlative study, in collecting the data the researcher only used tests for those two variables. They were the test of inferring word meaning from context and test of reading comprehension. The researcher classified the inferring word meaning from context ability as independent variable because the researcher assumed that inferring word meaning from context ability has an influence to the

language achievement; reading comprehension achievement. The data from reading comprehension test was classified as a dependent variable because the achievement is influenced by inferring word meaning from context ability.

After analyzing the result of students' ability in inferring word meaning from context, the researcher correlated it with the result of their achievement in reading comprehension in order to investigate whether there is any correlation or not by using Pearson product Moment Correlation as follows:

$$r_{xy} = \frac{n\,(\sum xy) - (\sum x)\,(\sum y)}{\sqrt{[N\ \sum x^2 - (\sum x)^2]\,[N\ \sum y^2 - (\sum y)^2]}}$$

(Hatch & Farhady, 1982: 198)

Note:

r : the coefficient correlation

x : inferring word meaning from context score

y : reading comprehension score

$\sum x$: the sum of scores in X-distribution

$\sum y$: the sum of scores in Y-distribution

$\sum xy$: the sum of products of paired X and Y distribution

$\sum x^2$: the sum of the squared scores in X distribution

$\sum y^2$: the sum of the squared scores in Y distribution

N : the number of paired X and Y scores

After that, Simple Regression was done to find how far the contribution of students' ability in inferring word meaning from context to their reading comprehension achievement. With the formulation as follows:

$$R = r^2$$

Note:

R : Regression

r : coefficient correlation

I. Hypothesis Testing

After finding the coefficient correlation between the students' ability in inferring word meaning from context and their achievement in reading comprehension, the researcher found out the criterion of the hypothesis acceptance. To determine whether the first hypothesis was accepted or rejected, the following criterion acceptance was used:

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

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

With the explanation as follows:

a. $H_{0.}$ There is no significant correlation between the students' ability in inferring word meaning from context and their achievement in reading comprehension. We could accept this hypothesis if r_{value} is lower than $r_{table.}$

b. H_1. There is significant correlation between the students' ability in inferring word meaning from context and their achievement in reading comprehension. We could accept this hypothesis if r_{value} is higher than $r_{table.}$