RESEARCH METHODOLOGY

3.1 Research Design

In this study, the researcher uses quantitative design, especially quasi experimental design to investigate the effect of PORPE strategy on reading comprehension at SMA NU 2. Quasi Experimental design was chosen for this research because experiment give the detail related to the cause-effect relations, Abbott & McKinney (2013). The research able to mentioned as experimental when found minimally one variable that has manipulated to know or learn cause-effect relations, Solso & MacLin (2002). According to Sugiyono (2009) defines that experimental research specialize to look for the influence of particular effect toward other people in controlled condition.

Quasi Experimental design divided into 2 form, they are time series design and non-equivalent control group design. Time series design and non-equivalent control group design has the same procedure like had explained before, such as there are experiment group and control group and next are giving prettest, treatment and posttest, factors that make it different are in choosing the subject, time series design the subject can not taken randomly, and non-equivalent control group able to take it randomly. And the present researcher will focus on quasi experimental time series design it means that the subject can not taken randomly. Below is the picture of quasi experimental-nonequivalent design based on Sugiyono (2010)

Group	Pre-Test	Treatment	Post-Test
Experiment	IPA 3^1	IPA 3^2	IPA 3^3
Control	IPA 2^1	-	IPA 2^2

Which is the meaning of symbol is below:

IPA 3^1 : IPA 3 and 2 will get pre-test which is administered, especially before the treatment for IPA 3

- : IPA 2 not get PORPE treatment because IPA 2 as control group

IPA 3^2 : PORPE treatment will be especially presented to IPA 3 as experimental group

IPA 3^3 & IPA 2^2: The post-test which is administered to IPA 3 and IPA 2

From the picture above can be seen that, the comparasion between experiment group and control group, before and and giving the treatment for both of group.

3.2 Population and Sample

3.2.1 Population

Population is a whole subject of this research, according to Ary et al (2010:148) population defined as all members. The population of this study is first semester of eleventh grade students at SMA NU 2 Gresik. There are two majors of eleventh grade, those are IPA and IPS. IPA class divided into 3 classes, they are IPA 1, IPA 2 and IPA 3 which are IPA 1 class has 34 students, IPA 2 has 30 students, IPA 3 has 30 students. Meanwhile IPS major only have one class, and consist of 34 students. But in this research, the population just will focus on eleventh grade of IPA, and based on the teacher IPA 2 is appropriate to be a control group and IPA 3 is appropriate to be an experimental group and automatically get the treatment, it because IPA 3 need more to be directed in english subject, so that they more deserve to get the treatment.

NO.	CLASS	NUMBER
1.	IPA 2	30
2.	IPA 3	30
TOTAL		60

3.2.2 Sample

Sample is a part of number and characteristic which belong to the population. According to Ary (2006) sample is a smaller number of observations taken from the total number making up a given population. The researcher collects the sample of grade 11 at SMA NU 2 Gresik especially IPA 2 and IPA 3. The researcher only choose two classes become the sample based on the recommendation of the teacher.

3.3 The Procedure of Collecting the Data

In this study, the researcher use quantitative method by giving a test. There are some procedures to collect the data:

1. Giving pre-test to the students grade 11 (IPA 2 and IPA 3) to measure student's reading comprehension skill before treatment.
2. And then giving 4 times treatement for experimental group and 4 times for control group.
3. Giving post-test to the students grade 11 (IPA 2 and IPA 3) to measure student's reading comprehension to know the effect of PORPE strategy after giving treatment.
4. Finding the differences between result of pre-test and post-test.
5. Analyzing the data using independent sample t-test to prove the hypothesis.

3.4 Validity of the test

According to Brown (2004) stated that a test is valid. It is appropriate, meaningful and useful in term of purpose of the test. In this study, the researcher uses content validity to analyze the test and construct validity to measuring and fix that every items is valid, According to Fraenkel and Wallen (2012, p.128) stated that construct validity refers to the nature of psychological construct or characteristic being measured. Acording to Ary (1990) content validity is not always numeric form but it can be determine whether the test items reflect the course and objectives in the curriculum guides, syllabus and course book.

3.5 Reliability of the test

In this study, the researcher used Cronbach's Alpha for measuring reliability of the test. The Formula of Cronbach's Alpha is:

$$r = \left(\frac{k}{k-1}\right)\left(1 - \frac{\Sigma Si^2}{St^2}\right)$$

Where :

    r   : Cronbach's Alpha Coefficient

    k   : Total of test items

    Σsi^2 : Total of test variance

    St^2 : Total variance

After knowing Cronbach's Alpha coefficient, we must condised in this Guilford (1956):

<0.20	: Very Low Reliability
0.20 – 0.39	: Low Reliability
0.40 – 0.59	: Intermediate Reliability
0.60 – 0.79	: High Reliability
0.80 – 1.00	: Very High Reliability

In SPSS 16.00, there are some procedures in measuring reliability of the test such as first is open SPSS 16.00 program. Second, choose file, New Data. Thridth, input the data in the data view. Fourth, click analyze, click scale and click reliability analyze. Next, it will appear dialogue box named realibility analysis. Input all variables in items box then choose alpha in the model, Last, click OK.

If Cronbranch's Alpha value > r-table, the test items are reliable but if Cronbach Alpha Value < r-table, the test items are not reliable.

3.6 The Readability of Reading Text

Readability formula will find out the reading level and grade level of materials and help to calculate grade level. There are many kinds of readability formula that can be used such as flesch reading case, flesch kincaid grade level, Gunning fog score, SMOG Index, and Coleman Liau Index . All of the readablilty measurment able to know in one way by using readability test website on internet.

In the flesch reading case test, higher scores indicate material that is easier to read, lower number mark passages that are more difficult to read. Score can be intrepreted as shown in the table below:

Score	School level	Notes
90.0-100.0	5th grade	Very easy to read. Eeasy understood by an average 11 years old student
80.0-90.0	6th grade	Easy to read. Conversational english for consumers
70.0 – 80.0	7th grade	Fairy easy to read
60.0 – 70.0	8th grade & 9th grade	Plaid english. Easily understood by 13 to 15 years old student
50.0 – 60.0	10th grade to 12th grade	Fairly difficult to read
30.0 – 50.0	Collage	Difficult to read
0.0-30.0	Collage graduate	Very difficult to read. Best understood by university graduates.

3.7 Data Collection

3.7.1 Instrument of Research

According to the data, developing instrument is one step in conducting research. The purpose of the research is to investigate the effect of PORPE strategy on reading comprehension at SMA NU 2 Gresik. The instruments of this study are test. The test will be distributed to the students after the teacher explain the material. There are two kinds of test, they are pre-test and post-test. The researcher uses test as instruments to collect the data. In this research, researcher uses pre-test and post-test as the instrument. Pre-test will be given before applying PORPE strategy, and post-test will be given after applying PORPE strategy.

3.7.1.1 Test

The most important point in this research is to collect data. Based on Brown (2004) test is a measurement tool to collect the data and to measure student abilities. So, the research instrument plays an important role in determining the research quality. Instrument can be determine whether the research successful or not. In this study, test is use for measure students reading comprehension in experimental group and control group. The researcher was used two kinds of test, those are pre-test and post-test for both group; experimental and control group. and both test model is 25 items of multiple choice.

3.7.1.2 Pre-Test

The student will be given pre-test in collecting the data to identify the student achievement in reading comprehension test, and automatically the test is about reading comprehension test. Pre-test will be given before student in experimental group get some treatments. The items of the test are taken from internet and made by researcher for eleventh grade with several modification. The pre-test model is multiple choice about 25 items.

3.7.1.3. Post-Test

The student will be given post-test for collecting the data after the student get some treatment for experimental group and control group without treatment. The test in this research is multiple choice that related to the material. Post-test become comparator between experimental group and control group.

3.1.7.1.4 Treatment

Before conducting the treatment, the researcher prepares and arranges teaching strategy that will be done by the researcher. The design is uses to facilitate the researcher in doing research especially in teaching reading comprehension using PORPE strategy. The treatment will be given for experimental group and will be conducted four times. Before doing the treatment, the researcher will introduce and explain this strategy to the students. Then, after introducing, the researcher directly going to the first step of PORPE, that is predict, in this step the students asked to make their predicted essay questions using these keywords; explain, discuss, compare, contrast and criticize based on paragraph story paper that had shared by researcher, minimally two questions. The next step is Organize, in this step the students asked to make a summary use their own languange. After that , for the next step the students asked to Rehearse, the students has to recite aloud what they had summarize before, with their beside chairmate. And next step is Practice, the students asked to answer their own predicted questions. And last is evaluate, the students asked to evaluate their own self by checklist self-correction checklist by researcher, to know how far they comprehend their reading comprehension.

3.1.7.5 Scoring for Pre-test and Post-test

Scoring is a result, usually expressed numerically. According to Thissen & Wainer (2001, p. 1) a test score is a summary evidence of the participant through those items. And for score the test, the researcher uses multiple choice as objective test for pre-test and post-test. And to decrease guessing answer the researcher use the formula as followed:

$$Skor = \left[\frac{\left(B - \frac{S}{P-1} \right)}{N} \right] \times 100$$

Where:

B = correct items
S = incorrect items
N = total items of multiple choices
P = total of option in multiple choices
1 = fixed number

3.8 Data Analysis

In this study, reading comprehension test will analyzed quantitatively. After collecting the data, the researcher will analyze the data. Analyzing the data is very important in a research because is to answer the statement of problem with the data taken from pre-test and post-test. The researcher analyzes the data by using t-test from SPSS program especially by using Independent sample t-test. Moreover, the samples are small and the groups are independent, the t-test for independent sample is carried out to determine whether there is any significant between experimental and control group using SPSS 16.00 version.

3.8.1 Normality Distribution Test

To analyze the normal distribution, this study uses Kolmogrov Smirnov Sample Test in version 16.0. It is aim to find whether or not the distribution of pre-test score in two groups are normally distributed. In this case, the result of the normality distribution is also used to find out whether or not the hypothesis that has determined is accepted. The first step in calculating the normality distribution test states that hypothesis. **H_0**: the score of the experimental and control group are normally distributed.

The second step is calculating the normality distribution test tried to compare the Sig. with the level of significance (0.05) the null hypothesis is accepted. The score normally distributed. On the other hand if the Sig. is less than the level of significance (0.05) the null hypothesis is rejected. The procedure to analyze is click the menu button, click analyze, click descriptive statistic, click explore and move all variable to Dependent list box, click Plots and then click Normality Plots with test then click continue.

3.8.2 Homogeneity Test of Variance

Homogeneity test of variance uses to know whether two groups are in the same position. For homogeneity test, the researcher uses Levene's test of homogeneity in SPSS 16.0 version because Levene's test of the homogeneity uses to assess the equality of the variance for a variable calculates for two or more groups. In this study has two groups; experimental and control groups. So, in study uses Levene's test. The test of Levene's test or P, defined as follow:

symbols defined as follow:

W $\quad W = \dfrac{(n-k)}{(k-1)} \dfrac{\sum_{i=1}^{k} n_i (\bar{Z}_{i.} - \bar{Z}_{..})^2}{\sum_{i=1}^{k} \sum_{j=1}^{n_i} (Z_{ij} - \bar{Z}_{i.})^2}$ $\qquad$: The result of the test

K $\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$: The number of different groups which the sample belong

N $\qquad$: The total number of sample in all groups

Ni $\qquad$: The number of sample in i group

$Y_{ij=}$ $\quad$: The value of jth sample from i^{th} group

$$Z_{ij} = \begin{cases} |Y_{ij} - \bar{Y}_i| & \bar{Y}_i \quad isameanofi^{th} group \\ |Y_{ij} - \tilde{Y}_i| & \tilde{Y}_i \quad isamedianofi^{th} group \end{cases}$$

The significance of P is tasted a gained F (α, k-1, N-k) where F is a quintile of the test distribution, with k – 1 and N – k its degrees of freedom, and __ is the chosen level of significance (0.05). To analyze the homogeneity, the researcher uses SPSS 16.0. The homogeneity will check in SPSS by Levene's test with the following procedure. First, a procedure is inserting the pre-test score of both groups using data view. The second is going to analyze menu, selecting compare means and the choosing independent sample t-test. The last procedure is interpreting the homogeneity test output, the researcher looks (sig.) at the Levene's test columns to know whether the quality of variance in group scores was homogeneity or not. If the sig. > α (0.05), two populations of variance were homogenous or equal but if sig. <α (0.05) two populations of variance were not homogenous or not equal.

3.8.3 Hypothesis Testing

Independent t-test uses to find out the significant difference of applying PORPE strategy on student's reading comprehension between experimental and control group. The steps of t-test calculation are: First, the test, the hypothesis of the research and the setting α (alpha) level at 0.05 (two-tailed test). The hypothesis in this research could be formulated as follow:

H_0 : There is no significance effect of applying PORPE strategy on student's reading comprehension at SMA NU 2 Gresik.

H_1 : There is significance effect of applying PORPE strategy on student's reading d comprehension at SMA NU 2 Gresik.

The second step is finding t-value using independent sample T-test and comparing the probability with the level of significance for testing the hypothesis. After the scores compute in SPSS 16.00 version, then see the output of Independent-Sample T-Test and interpret the output that if sig. (2 tailed) > α (0.05), the researcher should accept the H0, but if sig. (2 tailed) < α (0.05), the researcher can be rejected the H0, it means H1 accepted. T-test calculates to find out the comparison of two means between pre and post-test score of experimental and control group. In analyzing the data, the researcher uses independent t-test formula.

In calculating t-test, the researcher uses SPSS 16.00 version. The first steps, input the data of post-test in SPSS program between experimental and control group, then click Analyze then Compare Mean then Independent Sample T-Test. In Independent Sample T-Test, input the score variable into Test Variable column, and group variable in Grouping Variable column, then clicks Define Group, Choose group 1 (for experimental) and group 2 (for control), then click OK.