CHAPTER III

RESEARCH METHODOLOGY

This chapter describes research methodology which is used in the research. It deals with the steps and procedures of doing this research. In details, there will be description about method of research, data collection, research procedure, and data analysis.

3.1 Research Method

This research uses experimental design with quantitative and qualitative approach to answer the two research questions. Quantitative approach is used because this research is proposed to see the relationship between two variables, independent and dependent variable. In this research, the independent variable is the use of a series of pictures in teaching writing and the dependent variable is students' writing score of procedural text. Qualitative approach is used to analyze the result interview.

Specifically, this research uses quasi-experimental designs in order to get empirical data. Accrording to Hatch and Farhady (1982:24), quasi-experimental designs are practical compromises between true experimental designs and the nature of human behavior that we wish to investigate. Different with true experimental designs which can control all intern and extern variables in the research, quasi experimental designs control as many variables as we can in the research and it does not need randomization

(Sugiyono, 2009:77). Moreover, it also limits the kinds of our interpretations about cause-effect relationship and strengthens our generalization statements (Hatch and Farhady, 1982:24).

Furthermore, quasi experimental designs involve two groups, such as control and experimental groups. To see the differences between two groups, pre-test is administered to both groups before the treatments. Then, experimental group receives the treatments, while control group do not. Finally, post-test is employed in both groups to see whether there is score difference between two groups. The design of pre-test and post-test is described below:

Sample	Pre-Test	Treatment	Post-Test
G1	T1	X	T2
G2	T1	-	T2

Note:

G1 : experimental group

G2 : control group

T1 : pre-test

T2 : post-test

X : treatment

(Hatch and Farhady, 1982: 22)

3.2 Data Collection

3.2.1 Population and Sample

3.2.1.1 Population

Population is an area which has subject or object with certain quality and characteristics to be investigated by the researcher (Sugiyono, 2008:61). In this research, the population is the twelfth grade students of SMKN 3 Bandung, a business and tourism vocational school in Bandung. The reason for choosing SMKN 3 as the population is based on the assumption of the reputation as one of the best vocational schools in Bandung. Moreover, SMKN 3 has been certified by ISO:2001 which indicates the good management and the quality of the school.

3.2.1.2 Sample

This research uses purposive sampling to decide the sample of the research. Purposive sampling chooses the sample based on the researcher's judgment for a specific purpose (Fraenkel and Wallen, 1990:76). Since the researcher has an experience of teaching in SMKN 3 Bandung, then her personal judgment is used to choose the sample.

The research then takes only two groups in the twelfth grade students as control and experimental group. Twelfth grade students are chosen because teaching writing procedural text is for those classes. In

addition, twelfth grade students had experience in learning procedural text in their eleventh grade. The two classes are XII Marketing 3 (XII PJ-3) as the control group and XII Marketing 2 (XII PJ-2) as the experimental group. XII PJ-2 and XII PJ-3 are chosen as the sample due to the equal ability and characteristics among them.

3.2.2 Research Instruments

3.2.2.1 Test

Tests which consist of pre-test and post-test are given in the written form. Both tests are conducted in two groups. Pre-test in two groups is conducted to see students' prior level of writing assignment. Meanwhile, post-test is conducted to see whether or not there is difference in students' writing score before and after the treatments.

3.2.2.2 Questionnaire

Questionnaire is used to see students' response especially experimental group toward the use of series of pictures in teaching writing procedural text. Furthermore, the types of questions in the research questionnaire are closed-ended questions. Closed-ended questions have many advantages, such as providing consistency of response across respondents, generally easier to use, faster to tabulate and score for analysis on a computer (Fraenkel & Wallen, 1990:339). Closed-ended questions in the research use Likert scale such as Strongly Disagree (Sangat Tidak

Setuju/STS), Disagree (Tidak Setuju/TS), Agree (Setuju/S), and Strongly

Agree (Sangat Setuju/SS). The items of questionnaire can be seen from the

table below:

Table 3.1 the Items of Questionnaire

Variable	Aspects assessed	Indicators	The amount of items	No.
Series of pictures in teaching writing procedural text	The students' response toward the teaching and learning of procedural text	*Students' responses:* - Students like writing procedural text rather than writing other texts. - Ss feel that writing procedural text is easier than writing other texts.	2	1 2
	Students' response toward the use of series of pictures in: - Teaching Success	*By process:* - Ss is easy to write procedural text through series of pictures. - Ss are motivated. - Ss can know the text and language features of procedural text through series of pictures. - Teaching process is more interactive. - Teaching and learning process becomes more active. - Teaching and learning process is more fun. *By product:* - Vocabulary increases. - Writing skill increases. - Ideas of writing are easy to develop. - Grammar increases.	10	6 7 8 13 14 3 9 12 10 20
	- The teaching component	*Instructional objective:* - Ss can find out new knowledge. - Ss can develop their creativity. - The media is applicable. - Ss find difficulties in writing procedural text through series of pictures. *Teaching material:* - The material is understandable - Teaching instruction is understandable - The material is challenging. *Assessment:* - T corrects Ss' works during the process of teaching and learning.	8	18 11 4 17 5 19 15 16
	- The communication in learning and teaching process.	*Interaction:* - Ss give opinion at the classroom. - Ss are involved in the discussion.	2	21 22

*) The questionnaire items above is developed based on the fundamentals of teaching suggested by Sudjana (2005) cited in Furi (2008).

3.2.2.3 Interview

Interview is used to see students' responses which are not encountered in questionnaire. Interview has advantages such as the researcher can use open-ended questions to ask particular questions of special interest are asked deeper, follow-up questions can be asked, and answers that are unclear in questionnaire can be more explained (Fraenkel & Wallen, 1990:10).

3.3 Research Procedure

3.3.1 Organizing Teaching Procedure

In this research, series of pictures are used as treatment for the experimental group in teaching writing procedural text. Meanwhile, the control group uses conventional teaching in teaching writing procedural text. The researcher plays role as an instruction for teaching writing procedural text in both groups.

3.3.2 Administering Pilot-test and Questionnaire Try-out

Pilot-test is conducted to see whether the test is appropriate or not for the students. Pilot-test is conducted in 30 students of XII Marketing 1 (XII PJ-1) on November 3, 2009. Furthermore, because the questionnaire needs the validity and reliability test, therefore questionnaire try-out is conducted in this research. This is also conducted in XII PJ-1 on the same date of the pilot test.

3.3.3 Conducting Treatment

Both groups conduct the teaching and treatment in eight meetings. The procedures are:

- Preparing series of pictures for the experimental group and learning materials for conventional teaching in the control group.
- Preparing research instruments for pre-test, post-test, and questionnaire.
- Trying out research instruments in both groups.

In details, the schedule of research in both groups is described below:

Table 3.2 Schedule of Research in Control and Experiment Group

No.	Control Group		Experiment Group	
	Date	Materials	Date	Materials
1.	November 4, 2009 (3 x 45')	**Pre-test:** How to make avocado juice **Treatment 1:** Overview procedural text	November 6, 2009 (2 x 45')	**Pre-test:** How to make avocado juice
2.	November 5, 2009 (2 x 45')	**Treatment 2:** How to make fried rice	November 10, 2009 (3 x 45')	**Treatment 1:** Overview procedural text **Treatment 2:** How to make fried rice
3.	November 11, 2009 (3 x 45')	**Treatment 3:** How to install printer **Treatment 4:** How to remove a SIM-Card in hand phone	November 13, 2009 (2 x 45')	**Treatment 3:** How to install printer
4.	November 12, 2009 (2 x 45')	**Treatment 5:** Tie-dye project	November 17, 2009 (3 x 45')	**Treatment 4:** How to remove a SIM-Card in hand phone. **Treatment 5:** Tie-dye project
5.	November 18, 2009 (2 x 45')	**Post-test:** How to make avocado juice	November 20, 2009 (2 x 45')	**Post-test:** How to make avocado juice **Questionnaire**

3.4 Data Analysis

3.4.1 Scoring Technique of Pre-test and Post-test

The data of pre-test and post-test calculated by using scoring form of writing assessment by Brown & Bailey (1984:39-41) cited in Brown (2004: 244-245). There are five components which are examined in students' writing, such as organization, logical development of ideas (content), grammar, mechanics, and quality of expression (style and vocabulary). After scoring pre-test and post-test, then the data is analyzed by t-test formula in SPSS 16.0 windows.

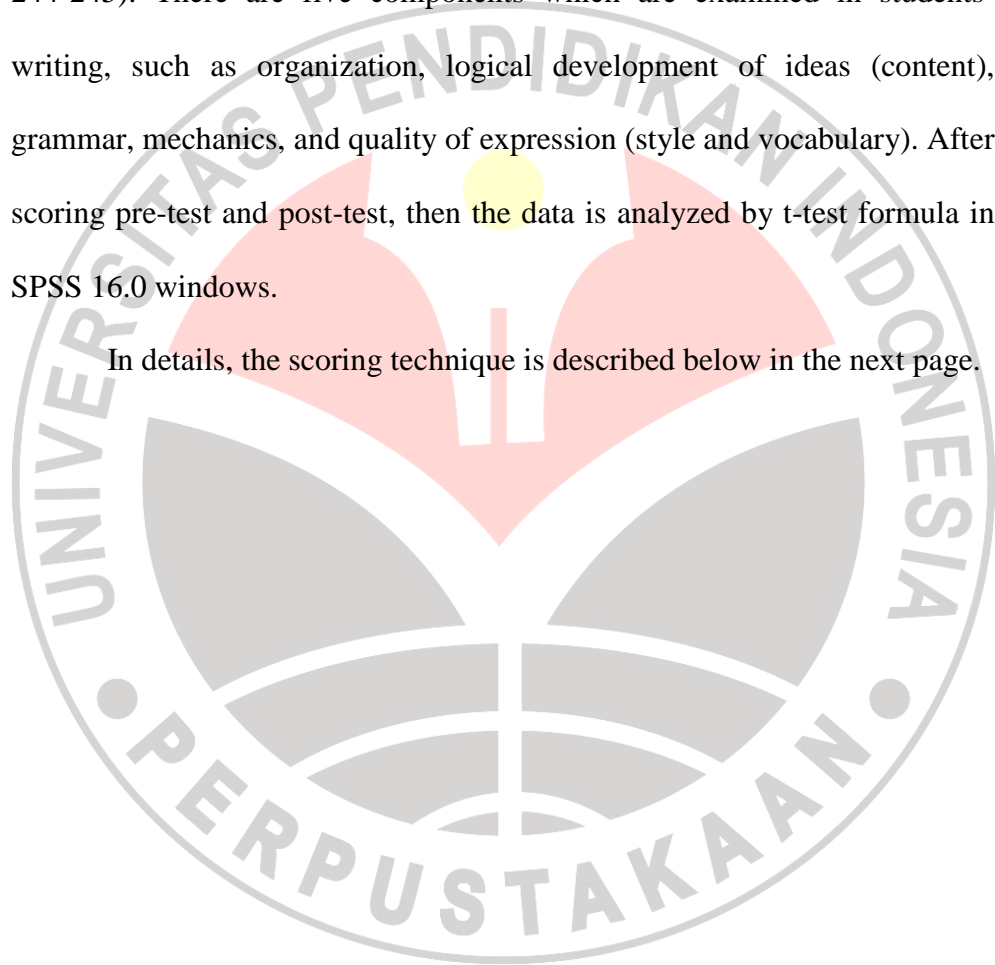In details, the scoring technique is described below in the next page.

Table 3.3 Analytic scale for rating composition tasks (Brown & Bailey, 1984:39-41 cited in Brown, 2004)

Analysis	20-18 Excellent to Good	17-15 Good to Adequate	14-12 Adequate to Fair	11-6 Unacceptable	5-1 Not High school-level work
I. **Organization: Introduction, body, and conclusion**	- Appropriate title - States effective introductory paragraph - Topic is stated, leads to body (organizes the steps logically) - Provides clear transitional expressions between steps (first, next, etc.) - Arrangement of material shows plan (could be outlined by reader) - Conclusion logical and complete.	- Adequate title introduction, and conclusion - Body of writing is acceptable, but some evidence may be lacking - Some ideas are not fully developed - Sequence is logical but transitional expressions may be absent or misused.	- Inadequate introduction or conclusion - Transitional expression between steps are thin - Problems with the order of ideas in body - The generalizations may not be fully supported by the evidence given - Problems of organization interfere.	- Uncertain or minimally recognizable introduction - Organization can barely be seen - Severe problems with ordering of ideas - Lack of supporting ideas - Lack of supporting evidence - Conclusion weak or illogical - Inadequate effort at organization	- Absence of introduction or conclusion - No apparent organization of body - Severe lack of supporting evidence - Writer has not made any effort to organize the composition (could not be outlined by reader)
II**. Logical development of ideas: Content**	- Writing addresses the assigned topic - The ideas are concrete and thoroughly developed - Writing reflects thought. - Provides materials and tools completely - Presents enough information so that the reader knows when the procedure is appropriate - provides details information such as amount, size, shape, etc.	- Writing addresses the issues but misses some points - Ideas could be more fully developed. - Materials and tools are stated but some are missing - Detail information is very thin	- Development of ideas not complete or writing is somewhat off the topic - Paragraphs are not divided exactly right. - Materials and tools are missing - Detail information is missing	- Ideas incomplete - Writing does not reflect careful thinking or was hurriedly written - Inadequate effort in area of content.	- Writing is completely inadequate and does not reflect high-school level work - No apparent effort to consider the topic carefully.
III. Grammar	- Native-like fluency in English grammar - Correct use of relative clauses, prepositions, modals, articles, verb forms, and tense sequencing - No fragments or extend sentences	- Advanced proficiency in English grammar - Some grammar problems do not influence communication, although the reader is aware of them - No fragments or extend sentences.	- Ideas are getting through to the reader, but grammar problems are apparent and have negative effect on communication - extend sentences or fragments present	- Numerous serious grammar problems interfere with communication of the writer's ideas - Grammar review of some areas clearly needed - Difficult to read sentences.	- Severe grammar problems interfere greatly with the message - Reader can not understand what the writer was trying to say - Unintelligible sentence structure.
IV. Punctuation, spelling, and mechanics	- Correct use of English writing conventions: left and right margins, all needed capitals, paragraphs intended, punctuation and spelling.	- Some problems with writing conventions or punctuation - Occasional spelling errors - Left margin correct	- Uses general writing conventions but has errors - Spelling problems distract reader - Punctuation errors interfere with ideas.	- Serious problems with format of paper - Parts of essay not legible - Errors in sentence punctuation and final punctuation - Unacceptable to educated readers	- Complete disregard for English writing conventions - Paper illegible - Obvious capitals missing, no margins, and severe spelling problems.
V. Style, vocabulary, and quality of expression	- Precise vocabulary usage - Use of parallel structures - Concise and register are well.	- Attempts variety, good vocabulary - Not wordy - Register OK - Style fairly concise.	- Some vocabulary misused - Lacks awareness of register - May be too wordy	- Poor expression of ideas - Problems in vocabulary - Lacks variety of structure	- Inappropriate use of vocabulary - No concept of register or sentence variety.

3.4.2 The Normality Distribution Test

The second step of analyzing the data is calculating the normality distribution test to see whether the data are normal or not. Kolmogorov-Smirnov test in SPSS 16.0 windows is used to analyze the normality distribution. Field (2005:93) states that Kolmogorov-Smirnov compares the scores in the sample to normally distributed scores with same mean and standard deviation. The steps of analyzing the normality distribution are as follows:

- Setting the alpha level at 0.05 (two tailed) and stating the hypothesis as follows:

    (H_0) = the scores of both experimental and control groups are normally distributed.

    (H_1) = the scores of both experimental and control groups are not normally distributed.

- Analyzing the normality distribution using Kolmogorov-Smirnov test in SPSS 16.0.

- Comparing the Asymp. Sig. (probability) with the level of significance for testing the hypothesis. If the Asymp. Sig. is more than the level of significance, the null hypothesis (H_0) is accepted, the scores are normally distributed (Trihendradi, 2009:140).

3.4.3 The Variance Homogeneity Test

After knowing that pre-test and post-test are normally distributed, the next step is analyzing its homogeneity by using Levene's test. Levene's test is used to test whether the variances in the groups are equal (Field, 2005: 98). The steps are described below as follows:

- Setting the alpha level at 0.05 (two tailed) and stating the hypothesis as follows:

    (H_0) = the variances of both experimental and control groups are homogenous.

    (H_1) = the variances of both experimental and control groups are not homogenous.

- Analyzing the homogeneity of variance by using Levene's test for equality of variance in SPSS 16.0.

- Comparing the Asymp. Sig. (probability) with the level of significance for testing the hypothesis. If the Asymp. Sig. > the level of significance, then (H_0) is accepted.

3.4.4 Independent t-test

Independent t-test is to see the difference between pre-test and post-test scores in both groups. Independent t-test is to find out whether there is a significant difference between the experimental and control groups' means

(Coolidge: 2000:141). In other words, it compares pre-test or post-test result between two groups, control and experimental groups.

The procedures of using the independent t-test by using SPSS 16.0 windows are described as follow:

- Stating the hypothesis as follows:

  (H_0) = there is no significant difference between pre-test mean for both control and experimental groups.

  (H_1) = there is significant difference between post-test mean for both control and experimental groups.

- The significant value is determined as follows: if the probability > 0.05, (H_0) is accepted. While if the probability < 0.05, (H_0) is not accepted. (Trihendradi, 2000:140).

3.4.5 The Effect Size

Effect size is used to see the effect size in the independent t-test of the research. The formula of effect size is:

$$r = \sqrt{\frac{t^2}{t + df}}$$

Note:

r : effect size

t   : t_{obs} or t_{value} from the calculation of independent t-test (post-test score)

df   :   degree of freedom

After the value is calculated, then the score is matched with the following scale to know the degree of effect size.

Table 3.4 Effect Size

Effect Size	r value
small	0.100
medium	0.243
large	0.371

(Coolidge, 2001: 151)

3.4.6 The Dependent t-test

The dependent t-test is used to analyze the score before and after treatments in the experimental group (Trihendradi, 2009: 146).

The procedures of using the dependent t-test by using SPSS 16.0 windows are described as follow:

- Stating the hypothesis as follows:

    (H_0) = there is no significant difference between the pre-test mean and post-test mean in the experimental group.

    (H_1) = there is significant difference between pre-test mean and post-test mean in the experimental group.

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- The significant value is determined as follows: if the probability $>$ 0.05, (H_0) is accepted. While if the probability $<$ 0.05, (H_0) is not accepted.

- Moreover, dependent t-test also can be analyzed through t_{crit}. The hypothesis are as follows:

  - H_0 is accepted and H_i is not accepted, if t_{obs} is between $\pm t_{crit}$ ($-t_{crit} < t_{obs} < t_{crit}$)
  - H_0 is not accepted and H_i is accepted, if $\pm t_{obs}$ is not between $\pm t_{crit}$ ($t_{obs} > t_{crit}$ or $t_{obs} < t_{crit}$). (Trihendradi, 2009: 148-149).

3.4.7 Data analysis of Questionnaire

3.4.7.1 Data Analysis of Questionnaire Try-out: Validity and Reliability

Validity and reliability in the research instruments means that those research instruments can be used to measure what we wish to investigate (Sugiyono:121, 2009). Validity and reliability are measured by implementing the formula of correlation coefficient by Cronbach's Alpha formula.

$$r_{11} = \left[\frac{k}{k-1}\right]\left[1 - \left[\frac{\sum \sigma_i^2}{\sigma t^2}\right]\right]$$

Note:

r_{11} : instrument reliability

k : number of question items

$\sum \sigma_i^2$:   the numbers of score variance

σt^2 :   total variance

The validity and reliability test used in this research is to test questionnaire only. Whereas, writing task in pre-test and post-test are not tested by the validity and reliability test because unlike listening and reading which have structured questions, the questions or command in writing task are clues only. Therefore, it is difficult to test the validity of writing tasks in this research.

However, Cronbach's Alpha formula is chosen to test the questionnaire because its item answers use Likert's scale which has four scales. According to Nugroho (2005) cited in Furi (2008), to measure the validity of the Likert's scale questionnaire, the result of the questionnaire try out is analyzed through Cornbach Alpha formula.

Moreover, Nugroho (2005) as cited in Furi (2007:45) says that a research instrument is indicated having high reliability if the coefficient of Cronbach's Alpha is ≥ 0.60. In addition, because there are 30 students in the questionnaire try out, therefore the degree of freedom is (df) n-2 or (30-2=28) and the level of significance is 5%. Based on the Corrected Item-Total Correlation table, the r_{table} is 0.361. Therefore, the item is valid if the $r_{count} > 0.361$ and invalid if $r_{count} < 0.361$. Only the valid items will be used for the questionnaire.

3.4.7.2 Data Analysis of Questionnaire Result

The formula for counting students' answer in questionnaire is the formula of percentage:

$$P = \frac{F_0}{n} \ x \ 100\%$$

Note:

P : percentage

F_0 : amount of each response for certain question

n : amount of all response for certain question