CHAPTER III

RESEARCH METHOD

This part discusses research design, population and samples, research instrument, data collection procedure and data analysis procedure.

A. Research Design

The design of the study was an experimental design using counterbalance procedure. Experimental design is a plan for an experiment that specifies what independent variables would be applied, the number of levels of each, how subjects are assigned to groups, and the dependent variable. [1]Counterbalanced procedure is an experimental design in which the effects of order was controlled by having all groups receive all treatments but in a different order. [2]The design was appropriate since the study investigated the effects of independent variable (ICT based graphic organizer) toward the dependent variable (students' writing score). Counterbalanced procedure was applied since the effects of order were controlled by having all groups received all treatments but in a different order (ICT based graphic organizer versus pattern outline).In the present study, the single group of the subjects were divided into two half that were called two treatment groups. They were Group A and Group B. The two half of student got treatment but the treatment was in different order: ICT based graphic

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[1] Donald Ary, Lucy Cheser Jacobs, Chris Sorensen, AsgharRazavieh. *Introduction to Research in Education.(eighth edition)*.(United States: Wadsworth Cengage Learning, 2010). p.641.
[2]*Ibid.* p.639.

organizerversus pattern outline. The different order of treatments functioned to control invalidity.

B. Population and Sample

Population is the group to which a researcher would like the results of a study to be able to generalize.[3] In the present study, the population of the study was all the writing III class students of the fourth semester English Education Study Program of Palangka Raya State Islamic Institute academic year 2015/ 2016. They were class A, B, C and D. To take the sample of the population, the researcher applied cluster sampling. Cluster sampling isa probability sampling technique that randomly selects and uses completely naturally occurring group such as intact classrooms or entire voting as the samples (clusters).[4]

The class B waschosen as the sample of the study for a number of reasons. First, the average writing score of class B represented the whole writing ability of the population. Second, class B enabled to apply graphic organizer in prewriting strategies. Third, they passed Writing II course. Fourth, the course material of Writing III covered expository essays, including comparison and contrast essay and based on the new curriculum of English Education Study Program of Palangka Raya State Islamic Institute; it was taught at the fourth semester. The number of the sample was 21students.

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[3] L.R. Gay. *Educational Research: Competencies for Analysis & Application. Second Edition*. (Toronto: Charles E. Merrill Publishing Company, 1981) p. 101.

Donald Ary, Lucy Cheser Jacobs, Chris Sorensen, AsgharRazavieh. *Introduction to Research in Education.(eighth edition)*.(United States: Wadsworth Cengage Learning, 2010). P. 666

C. The Research Instruments

The data of the study were collected through two research instruments, i.e.: test, and questionnaire.

1. Test

Test instrument is a measuring device built as a series of tasks to which a person is to respond. When scored, the test gives a quantification of the characteristic that the test is designed to measure.[5]Here, the students are assigned to write a comparison and contrast essay using ICT Based Graphic Organizers and using pattern outline on different time. The tests are used to measure the students' writing scoreusing ICT Based Graphic Organizers and using pattern outline. The test is done three times: pretest, post test session 1 and post test session 2. Test was the main instrument to collect the data about the students' writing score.

2. Questionnaire

A questionnaire consists of a number of questions printed or typed in a definite order on a form or set of forms. The questionnaire is mailed to respondents who are expected to read and understand the questions and write down the reply in the space meant for the purpose in the questionnaire itself. The respondents have to answer the questions on their own.[6] To answer the research problem number 2, that was to see in what ways, ICT Based graphic organizer gave contribution to students in the writing process, the questionnaire distributed to the students. The questionnaire consisted some aspects of students' response related to the use of ICT based graphic organizer in writing class and the area of

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[5] Hopkins, Charles, D. *Understanding Educational Research: An inquiry Approach.* (Colombus: Charles E. Merril Publishing Company, 1980).p. 464.

[6] C.R Kothari. 2004. Research Methodology. Method and Techniques. **New Age International (P) Limited, Publishers.** 4835/24, Ansari Road, Daryaganj, New Delhi – 110002.

contribution of GO in writing process.The result of the questionnaire was analyzed using percentage.

D. Instrumentation

1. Test Type

The type of the test used to collect the data was in the form of writing test, especially comparison and contrast writing test using and without using ICT basedgraphic organizer. The test consisted of the instructions/ directions and statements the subjects addressed in their writing and the alternative topics to be chosen. In this sense, the students were assigned to choose one of topics that interest them. They were asked to develop the topic into an essay containing about 400 to 500 words. The allocated time was about 120 minutes.

2. Test Construction

The test construction was based on the objectives of the study. The study was aimed at finding out the effectiveness of using ICT based graphic organizerin writing comparison and contrast essay. To investigate the effectiveness of using ICT based graphic organizerin writing comparison and contrast essay, the subjects were assigned to write comparison and contrast essay using ICT based graphic organizerand without using ICT based graphic organizer. The results of the two tests were investigated using statistical analysis and the outcomes were compared to see the effects of using ICT based graphic organizeron writing. In addition both tests were scored using scoring guidelines below:

Table 3.1. Scoring Guide for Try Out[7]

Category	4	3	2	1
Content	Develops and shapes information with well-chosen details across the paragraph	Develops and shapes information with well-chosen details in parts of the paragraph Develops information with some details.	Presents some clear information, but is list like, undeveloped, or repetitive, or offer no more than a well-written beginning	Attempts to respond to prompt, but provides little or no clear information; may only paraphrase the prompt.
Purpose and supporting details	The paper compares and contrast items clearly. The paper points to specific examples to illustrate the comparison. The paper includes only the information relevant to the comparison.	The paper compares and contrasts items clearly, but the supporting information is general. The paper includes only the information relevant to the comparison.	The paper compares and contrast items clearly, but the supporting information is incomplete. The paper may include information that is not relevant to the comparison	The paper compares and contrast, but does not include both. There is no supporting information or support is incomplete.
Organization and structure	The paper breaks the information into whole-to-whole, similarities-to-differences, or point-by-point structure. It follows a consistent order when discussing the comparison.	The paper breaks the information into whole-to-whole, similarities-to-differences, or point-by-point structure. But does not follow a consistent order when discussing the comparison.	The paper breaks the information into whole-to-whole, similarities-to-differences, or point-by-point structure. But some information is in wring section. Some details are not in a logical or expected order, and this distracts the reader.	Many details are not in a logical or expected order. There is little sense that the writing is organized.

a. Test Validity and Reliability

Validity is the degree to which a method actually measured what it claimed to measure.[8] The validity is classified into content, construct, and face validity. In this study, the validation of instrument is mainly directed to the face and content validity, that is, to make the test items (contents) match with what is

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[7]International Journal of English language Teaching Vol.3, No.1, pp.11-31, March 2015 Published by European Centre for Research Training and Development UK (www.eajournals.org)

[8]Hellriegel, et.al..*Organizational Behavior*. (Ohio: South Western College Publishing, 1998) p. 632.

supposed to measure. Related to writing test, the content validity can be checked by examining the agreement between the objectives of the course and the test used to measure the objectives. In this case, the students were assigned to write a comparison and contrast essay, which was matched with the syllabus of Writing III course. Then, in terms of the face validity, the test assigned the students to write a comparison and contrast essay. The topics to be selected were also familiar to students. Next, construct validity meant that the test really measure the intended construct. [9]

In this sense, there were some efforts to make the test construction and content valid (test of validity). First, the researcher made the test be true measure. It means that the test matched with what supposed to measure. Here, the test showed agreement between the test scores and objectives. Second, the researcher determined that the test types matches with test objectives. After determining the test types, the researcher determined the test content suitable with the test. In this sense, the primary concern was focused on the topics of the essay. The topic selection was based on the objectives of test, students' background knowledge and interests.

Afterwards, the writing test was constructed. It contained the directions that the students have to do the test. Then, the test try out was done to the students having the same characteristics with the subjects of the study. It was done for the improvement and clarification of the instructions. The revision of test instruction

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[9] Donald Ary, Lucy Cheser Jacobs, Chris Sorensen, AsgharRazavieh. *Introduction to Research in Education.(eighth edition)*.(United States: Wadsworth Cengage Learning, 2010). p.235.

was made after having the test try out. Finally, the final form of writing test was done to the experiment class.

In addition, reliability is the accuracy of measurement and the consistency of results.[10] It is the degree of consistency with which it measures whatever it is measuring.[11]Similarly, Sekaran states that reliability is the extent of consistency and stability of the measuring instrument.[12] In this case, to score composition as fairly and consistently as possible, the researcher used inter-rater method (test of reliability). Inter-rater reliability is the consistency of the judgment of several raters on how they see a phenomenon or interpret the responses of the subjects.

In this case, two raters were employed to score the students' writing. The two raters were the researcher and the English teachers who have a lot of experience in teaching English at English Education Study Program of Palangka Raya State Islamic Institute. One important thing in using the inter rater method in rating process is focused with the training of the raters.[13] It can maximize the accuracy of the writing assessment. This makes the raters be consistent in scoring and avoid subjectivity of the raters in scoring. For this purpose, the training was done to get inter rater agreement in order to give reliable scores to students' writing product.

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[10]Hellriegel. *Organizational Behavior*. (Ohio: South Western College Publishing, 1998) p. 631.

[11] Donald Ary, Lucy Cheser Jacobs, Chris Sorensen, AsgharRazavieh. *Introduction to Research in Education.(eighth edition)*.(United States: Wadsworth Cengage Learning, 2010). p.236.

[12]Umi, Sekaran. *Research Methods for Business: A Skill Building Approach*. (New York: John Wiley & Sons, Inc, 1992) p. 367.

[13]Weigle, S.C. *Assessing Writing*. (Cambridge: Cambridge University Press, 2002) p. 36.

Relevant to this, Nunan stated that the acceptance reliability on composition scores are possible to get through careful training of raters.[14] Moreover, Latief argues that reliability on composition scoring is affected by both raters and writers of the essay. Raters' reliability refers to the accuracy of the raters' judgment. Meanwhile, writers' reliability refers to the accuracy of the writers' performance.[15]

In this study to make test item was validity and reliability, the researcher tried out the test item into Writing III in class A on Friday, March 25, 2016 in room F.2.1.The students of class A consisted of 20 students.

b. Rater Reliability

Reliability refers to the consistency with which a test measured whatever it measured.[16] Similarly, Latief states that reliability refers to the preciseness of the language skill assessment results in representing the actual level of the examinee's skills.[17] In this study, reliability of the writing test mainly focuses on the rater reliability since the scores are obtained from the judgment of two different raters. Here, the consistency in rating scores is very important in measuring the students' writing skill. The consistency can be achieved through rater training.

In rater reliability, there are inter-rater and intra-rater reliability. Inter-rater reliability indicates accuracy in scoring compositions of different raters.

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[14] David, Nunan. *Research Methods in Language Learning*. (Cambridge: Cambridge University Press, 1992) p.56.
[15] Adnan, M. Latief. Reliability of Language Skills Assessment Results. *JurnalIlmuPendidikan*VIII No 3, 214-224., 2001.
[16] Hopkins, C.D. & Richard, L.A. *Classroom Measurement and Evaluation.* (Illinois: F.E. Peacock Publishers, Inc., 1990) p.295.
[17] Adnan, M. Latief. Reliability of Language Skills Assessment Results. *JurnalIlmuPendidikan*VIII No 3, 214-224., 2001.

Meanwhile, intra-rater reliability refers to the consistency of the rater in scoring the same paper at two different points of time.[18] It points out an individual accuracy in scoring a particular composition.

To obtain inter rater reliability; the scores of the two raters were correlated using SPSS 16 program using Product Moment Correlation calculation. Here, the students' writing products were assessed by two raters: the researcher and the writing lecturer. The two different writing scores were correlated using Product Moment correlation in order to see the reliability of the students' score. The result was in Table 3.2.

Table 3.2 Correlations

		RATER1	RATER2
RATER1	Pearson Correlation	1	.919[**]
	Sig. (2-tailed)		.000
	N	20	20
RATER2	Pearson Correlation	.919[**]	1
	Sig. (2-tailed)	.000	
	N	20	20

**. Correlation is significant at the 0.01 level (2-tailed).

The obtained inter-rater reliability coefficient for scores of both raters was 0.919. It lied between .90 to 1.00 (See Appendix 8 for detail). Based on the intrepratation of coefficient correlation, it belonged to high positive inter-rater reliability category. The obtained coefficient indicated that the students' writing products achieved the acceptable level of reliability. It meant that the students'

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[18]Nur, Mukminatien. *The Differences of Students' Writing Achievements Across Different Course Level.* Unpublished Dissertation. Malang: State University of Malang, 1997) p.8.

writing product had been scored as fairly and consistency as possible. In this case, the researcher applied the coefficient correlation and the interpretation of inter-rater reliability proposed by Winkle et al as shown in Table 3.3.

Table 3.3 Inter-rater Coefficient Correlation and Interpretation[19]

Correlation Coefficient	Interpretation
.90 to 1.00 or -.90 to -1.00	Very high positive or negative correlation
.70 to .89 or -.70 to -.89	High positive or negative correlation
.50 to .69 or -.50 to -.69	Moderate positive or negative correlation
.30 to .49 or -.30 to -.49	Low positive or negative correlation
.00 to .29 or -.00 to -.29	Little if any correlation

D. Data Collection Procedure

The study was aimed at investigating the effectiveness of using ICT basedgraphic organizeron the quality of composition written by experimental group of students. To collect the data, the researcher employed counterbalanced procedure. In the procedure, the single group of the subjects were divided into two half that are called two treatment groups. The two half of students got treatment but the treatment was in different order: ICT based graphic organizerversus pattern outline. The different order of treatments functioned to control invalidity. Here, there were two sessions of test. Thetest session 1 was given to the students on Thursday, 31 March 2016 at 07.00- 09.15 in Room A2.2. The numbers of the students were 21 of 25 students.Meanwhile, the test session 2 was given to the students on Thursday, 21April 2016 at 07.00- 09.15 in Room A2.2. The numbers of the students were 21 of 25 students.

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[19] Anthony C. Winkle, and Jo Roy McCuen. *Writing the Research Paper*. (Orlando: Harcount Brace Jovanovich Publishers, 1989) p. 35.

In short, the procedure to collect the data was as follows:

1. Conducting preliminary study. The preliminary study was done on on Thursday, 17 March 2016 at 07.00- 09.15 in Room A2.2. Here the researcher observed the class that would be researched. The observation covered the syllabus of Writing III. It was about the class schedule, materials, course outline and the learning process. (see Appendix 9). This was done in order to know the early problems in writing class and to check the material covering comparison and contrast in Writing III.

2. Determining the subject of research using cluster sampling technique. Here, there were four writing III classes. The researcher determinedone of the classes selected to be the subject of research that representedthe average writing ability of the whole class. The students of Writing III B class were selected to be the subject of the study. The number of the subject was 21 students.

3. Giving a try out test in order to see the validity and reliability of the test.The try out test was done on 25 March 2016 in Writing III A. The test assigned the students to write a comparison and contrast essay with various topics. (see Appendix 8). The try out was given to the students of Writing III Class A. The number of the subject was 20 students. It was done on Friday, April 25, 2016 in room F2.1.

4. Giving treatment. Here, the researcher socialized the use of ICT based graphic organizer in writing comparison and contrast essay. The socialization covered the software of ICT based graphic organizer, the procedures to use

ICT based graphic organizer in writing comparison and contrast essay. In giving treatment, the counterbalance procedure were applied. In the procedure, the single group of the subjects were divided into two half that were called two treatment groups (Group A and group B). The two half of students get treatment but the treatment is in different order: ICT based graphic organizer versus Pattern Outline). (see Appendix 4).

5. Giving final test. After doing the treatment, the researcher gave test in two sessionsin order to measure the effect of pattern outlining and ICT based graphic organizer in writing comparison and contrast essay. Here, each the student was assigned to write two model of comparison and contrast essay using ICT based graphic organizer versus pattern outline) in different period of time (see Appendix 1).

6. Analyzing data to answer the research problem number one. Here, the means of both students' writing scores: (ICT based graphic organizer versus outline pattern) of Group A and Group Bwere compared in order to see effects of ICT based graphic organizer in writing comparison and contrast essay. The t paired sample t test applied to analyze the data, since the subjects were the same.

7. Distributing questionnaire. The questionnaire was distributed to the students on Thursday, 21April 2016 at 09.30- 10.00 in Room A2.2. The numbers of the students were 21 respondents. It was done to answer the research problem number two. To see in what ways, ICT Based graphic organizer gave contribution to students in the writing process, the questionnaire distributed to

the students. The questionnaire consisted some aspects of students' response related to the use of ICT based graphic organizer in writing class and the area of contribution of GO in writing process. (see Appendix 6)

8. Interpreting the result. The result of the t test from manual calculation was interpreted. If the t observed was higher than t table, the Ha stating that the students who taught using ICT based graphic organizer get better achievement than those who taught without using ICT based graphic organizer was accepted, and the Ho stating that the students who taught using ICT based graphic organizer do not get better achievement than those who taught without ICT based using graphic organizer was rejected. Meanwhile, if the t observed was smaller than t table, the Ha was rejected and the Ho was accepted. Meanwhile, the result of Sig from SPSS 16 program was identified, If the Sig was smaller than 0.05, the Ha was accepted and Ho was rejected. On the contrary, if the Sig was higher than 0.05, the Ha was rejected and Ho was accepted.

9. Making discussion and conclusion. The discussion was made to clarify the research finding. Here, the researcherquoted some experts' theory to support the research finding.

The procedure to collect the data was described as the following steps. After given short explanation on the purpose of the study and the way to carry out, the students were divided into two halves of treatment groups. Each treatment group consisted of 21 students. Two treatment groups of the subjects were exposed to two treatments: ICT based graphic organizer versus pattern outline.

The essay writing both using ICT based graphic organizer pattern outlinestarted at the different time. Before starting to write, the ICT based graphic organizer group made graphic organizerof the topic selected. On the contrary, the non- ICT based organizer group started to write an essay with outline pattern. The data were collected in two meetings during the proposed semester.

To sum up, the data collection was in two sessions. In the first session, the two groups of subjects were assigned to write a comparison and contrast essay. Group A wrote a comparison and contrast essay using a pattern outline. Meanwhile, Group B wrote a comparison and contrast essay using ICT Based Graphic Organizer. In the second session, the two groups of subjects were assigned to write a comparison and contrast essay. Group A wrote a comparison and contrast essay using ICT Based Graphic Organizer. Group B wrote a comparison and contrast essay using a pattern outline.

The data were collected in two meetings during the proposed semester. In order to have better understanding on the procedure in essay writing with counterbalance procedure, it could be seen in Table 3.4.

Table 3.4The Procedure of Essay Writing Test

Sessions	Subjects: 21=10/ 11		Writing Strategy
First	Group A		Using pattern outline
		Group B	Using ICT Based Graphic Organizer
Second	Group A		Using ICT Based Graphic Organizer
		Group B	Using pattern outline

The method of data collection used in the present study and how the research problems would be answered were summarized in Table 3.5.

Table 3.5 The Source of data, instruments, and data needed

Source of data	Instruments	Data needed
Students of writing III B class	test	To give try out test in order to find the validity and rater reliability of the test
Students of writing III B class	Test session 1	To know the students' score in writing essay using pattern outline and ICT Based Graphic Organizer
Students of writing III B class	test session 2	To know the students' score in writing essay using ICT Based Graphic Organizer and pattern outline.
Students of writing III B class	Questionnaire	To find the area of contribution of GO in the students' writing progress.

E. Data Analysis Procedure

The data of the study were the students' writing scores. In this case, the data were in form of quantitative data. The data were analyzed by means of inferential statistics. This statistical analysis was suitable to use to answer the research problem. In this case, the researcher applies T-test for paired samples to examine the difference score between the students who use graphic organizerand those who do not use ICT based graphic organizerin writing comparison and contrast essay. T-test for correlated samples is a statistical test that establishes a significant mean difference in a variable between two groups.[20] In this design the subjects were exposed to a combination of treatments.

In order to analyze the data, the researcher did some procedures:

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[20] Uma, Sekaran. *Research Methods for Business: A Skill Building Approach*. (New York: John Wiley & Sons, Inc, 1992) p. 372.

1. Collecting the score of the students' writing product (students' worksheet using ICT based graphic organizer and pattern outline, portfolios covering the students' composition, and revising checklists using peer correction).

2. The researcher measured normality of score in order to know the normality of the data that is needed to test the hypothesis. Here, the Kolmogorov-Smirnov[a] test was applied to find the normality. Based on the Kolmogorov-Smirnov[a]test, it was shown that the value of Sig. was 0.162. Since it was higher than 0.05, the data was said to be normally distributed.

3. The researcher measured homogeneity. It was used to know relatively same variant or not of the data. Here, the levene's test was applied to see the homogeneity. Based on the Levene'stest, it was shown that the value of Sig. was 0.142. Since it was higher than 0.05, the data was not violated the homogeneity.

4. Tabulating the data into the table of difference sore, then find out the mean of students' score, standard deviation of variable by using the formulas bellow:

   a. Mean

   $$M = \frac{\sum FX}{N}$$

   Where:
   M = Mean
   F = Frequency
   X= The scores

   b. Computing the probability of the mean differences of this sample given that the sample comes from the null hypothesis population of difference scores.

First, Calculating the difference scores and the intermediate numbers for the SS formula:

	$M = \dfrac{\sum FX}{N}$	$M = \dfrac{\sum FX}{N}$	$\sum D$	$\sum d$	$\sum d^2$

Where:

M = means of X, D= difference score, d= difference score − means of D, d^2 = result of d squared.

Second, measuring correlated sample t-test. In the beginning, measure the mean in each group or $\bar{X}$ = Mean of X. $\bar{X}_1$ is mean of writing score using GO. $\bar{X}_2$ is mean of writing score using Pattern Outline. $\sum d^2$ = Total of deviation is squared from different mean between X_1(GO) and X_2 (Pattern Outline). *n* is Number of Students, consisted of 21 of 25 students.

Third, measured correlated sample t-test. Here, the formula of t_{1-2} in correlated sample t-test:

$$t_{1-2} = \dfrac{\overline{X_1} - \overline{X_2}}{\sqrt{\dfrac{\sum d^2}{n \ (n-1)}}}$$

Where:

$\bar{X}_1$ = Means of X

$\sum d^2$ = Total of deviation from different mean between X_1-X_2

n   = Number of Students.

Fourth, determining the degree of freedom *(d.f)* using formula: *df*= N-1. *df*=21-1=20. Level of Significance for a Nondirectional (one-Tailed) Test
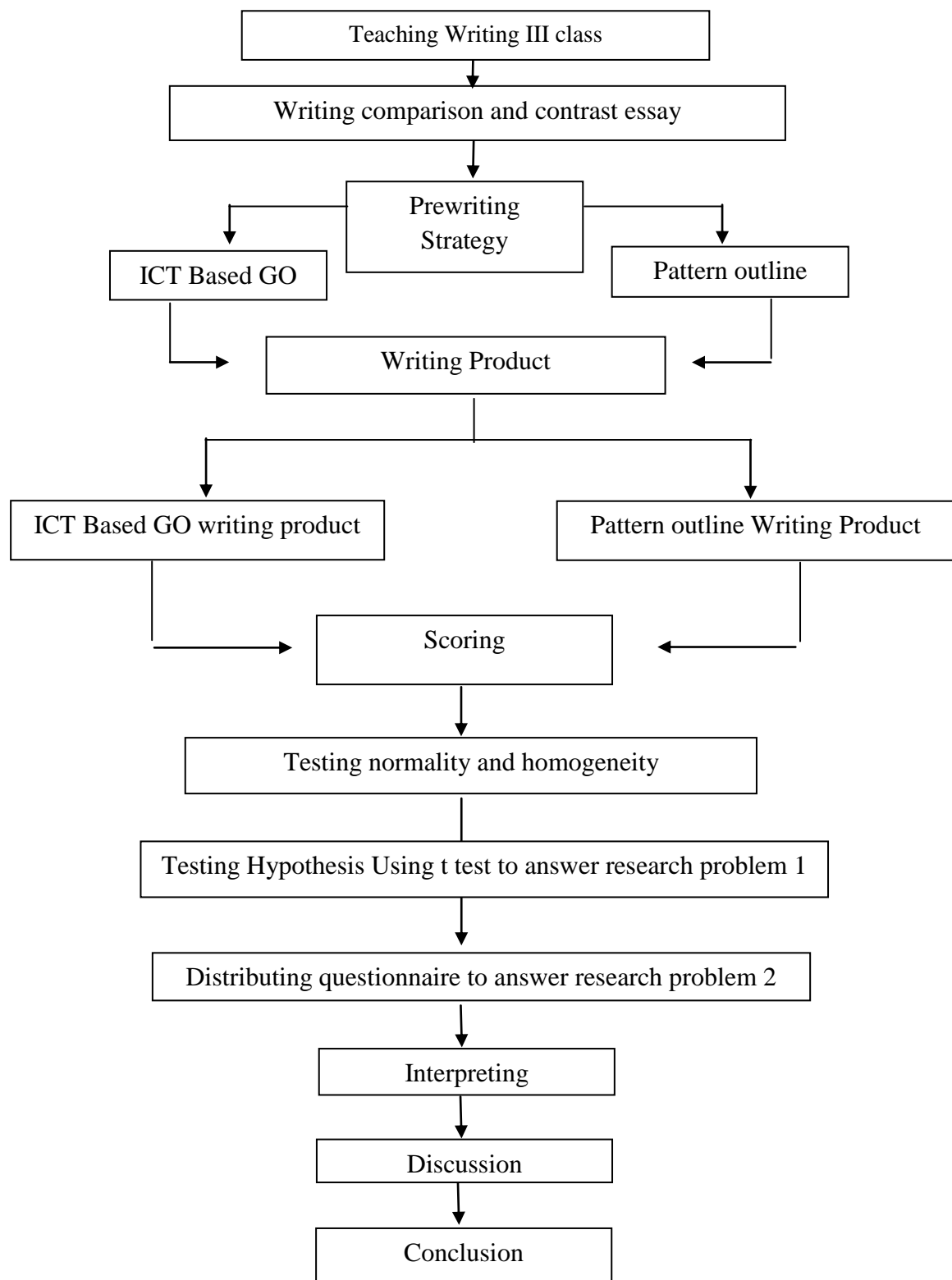
Fifth, interpreting the result of statistical calculation by comparing the t observed with t table with the criteria:

If t $_{observed}$ $\geq$ t$_{table}$, Ha is accepted and Ho is rejected

If t$_{test}$ $\leq$ t$_{table}$, Ha is rejected and Ho is accepted

5. In addition, the researcher used SPSS 21.0 program to compare the result with the manual one. The result of Sig from SPSS 16 program was identified. If the Sig was smaller than 0.05, the Ha was accepted and Ho was rejected. On the contrary, if the Sig was higher than 0.05, the Ha was rejected and Ho was accepted.

To sum up, the steps in collecting, analyzing, and hypothesis testing can be described below. In the earlier step, the subjects selected a topic for comparison and contrast essay. They were assigned to write comparison and contrast essay using ICT based graphic organizer and without using ICT based graphic organizer. Then, the subjects' writing both using ICT based graphic organizer and without using ICT based graphic organizer was scored by two raters. To analyze the data of writing scores, a t test for paired samples was employed. T test for paired samples is a statistical computation used to test significant difference between two mean from two distributions. Then, the research hypothesis will be tested to answer the research problem no. 1. Then, to answer the research problem no. 2, the researcher distributed the questionnaire to the students. The questionnaire covered some aspects of students' response related to the use of ICT based graphic organizer in writing class. Lastly, a discussion on the results was made to clarify the findings, as described in Figure 3.1

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┌─────────────────────────────────────┐
│      Teaching Writing III class      │
└─────────────────────────────────────┘
                  ↓
┌─────────────────────────────────────┐
│  Writing comparison and contrast essay │
└─────────────────────────────────────┘
                  ↓
          ┌──────────────────┐
          │   Prewriting     │
          │   Strategy       │
          └──────────────────┘
      ↙                        ↘
┌──────────────┐          ┌──────────────────┐
│ ICT Based GO │          │  Pattern outline │
└──────────────┘          └──────────────────┘
      ↓                           ↓
        ┌──────────────────────┐
        │    Writing Product   │
        └──────────────────────┘
      ↙                        ↘
┌──────────────────────────┐  ┌──────────────────────────────┐
│ ICT Based GO writing product │  │ Pattern outline Writing Product │
└──────────────────────────┘  └──────────────────────────────┘
      ↓                           ↓
          ┌──────────────────┐
          │     Scoring      │
          └──────────────────┘
                  ↓
      ┌────────────────────────────────┐
      │ Testing normality and homogeneity │
      └────────────────────────────────┘
                  ↓
┌──────────────────────────────────────────────────┐
│ Testing Hypothesis Using t test to answer research problem 1 │
└──────────────────────────────────────────────────┘
                  ↓
┌────────────────────────────────────────────────┐
│ Distributing questionnaire to answer research problem 2 │
└────────────────────────────────────────────────┘
                  ↓
          ┌──────────────────┐
          │   Interpreting   │
          └──────────────────┘
                  ↓
          ┌──────────────────┐
          │    Discussion    │
          └──────────────────┘
                  ↓
          ┌──────────────────┐
          │    Conclusion    │
          └──────────────────┘
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Figure 3.1 Steps in Collecting and Analyzing Data, and Testing Hypothesis

F. Summary

This experiment study attempted to answer the two research problems: 1. whether there is a significant difference or not between writing with ICT basedgraphic organizerand writing without using it on the students' writing achievement; 2. In what ways, ICT based graphic organizer give contribution to students in the writing process at the fourth semester English Education Study Program students of Palangka Raya State Islamic Institute 2015/2016 academic years. To answer the research problem, the study assigned the subjects to choose an appropriate ICT based graphic organizer, before writing comparison and contrast essay. To see the effects of using ICT based graphic organizerthe subjects were also assigned to write comparison and contrast essay without using ICT based graphic organizer. Here, they are directed to write comparison and contrast essay using pattern outline. Counterbalanced procedure wasemployed to control the order effect of the two different treatments. Then, to answer the research problem number 2, the researcher distributed the questionnaire to the students. The questionnaire covered some aspects of students' response related to the use of ICT based graphic organizer in writing class. Such as: visualizing idea, maintaining grammar, building sentences, and generating idea.

Then, the two raters were involved in scoring the students' writing products. Here, the raters were given training before rating the composition in order that they had better understanding on scoring criteria. The study focused on the evaluation of particular aspect of composition. That is, how the subjects

developed and organized the main idea of an essay. The data of the study wereanalyzed using t test for paired samples provided by SPSS 16 program.