Available online at: http://journal.uny.ac.id/index.php/ljtp

LingTera, 7 (1), 2020, 72-83

Effect of project-based learning and problem-based learning on the students' writing achievement

Tri Cahyaningrum *, Agus Widyantoro

Universitas Negeri Yogyakarta. Jalan Colombo No.1 Karangmalang, Yogyakarta, 55281, Indonesia.
* Corresponding Author. E-mail: cahza_aza@yahoo.com

Received: 18 April 2017; Revised: 29 July 2020; Accepted: 15 August 2020

Abstract: The objective of the research is to find out significant differences on the writing achievement between students taught through Project-Based Learning, Problem-Based Learning, and those who are not. This research is quasi-experimental research. The subjects consisted of two groups of students as the experimental groups and one group as the control group. The data were obtained by essay writing tests. The data analysis used descriptive analysis and inferential statistics. The hypothesis was tested using the analysis of covariance (ANCOVA) at the significance level of 0.05. The result of the ANCOVA in the posttest score shows that the significance value is 0.001, which is less than the significance level of 0.05 ($F = 7.493$, $p < 0.05$). This means that there is a significant difference in the writing ability among grade eight students of SMP N 2 Kalasan taught by using the Project-Based Learning, from those taught using the Problem-Based Learning and those who are not.

Keywords: project-based learning, problem-based learning, students' writing achievement

How to Cite: Cahyaningrum, T., & Widyantoro, A. (2020). Effect of project-based learning and problem-based learning on the students' writing achievement. *LingTera*, *7*(1), 72-83. doi:https://doi.org/10.21831/lt.v7i1.13700

INTRODUCTION

English as a foreign language in Indonesia becomes dominant in various aspects of Indonesian daily life such as education, transportation, and telecommunication. In education, English becomes an important language in transferring knowledge and technology. Consequently, the people are required to learn English in order to communicate and understand knowledge and technology.

To achieve the goal, the government puts English in the school curriculum. Several years ago, English was only taught in junior high schools, senior high schools or vocational high schools, and universties. Nowadays, many elementary schools and kindergartens in Indonesia also introduce and teach English to young children. English has been taught at junior and senior high schools as a compulsory subject. In addition English plays an important role as one of the subjects included in the national examination.

In language learning, especially English, there are four skills that should be mastered by students i.e., listening, speaking, and reading, and writing. These language skills are closely related to each other. For example, listening skills can give contributions to speaking skills, reading skills give contribution to writing skills or vice versa.

Of those four skills, there is no doubt that writing is in language skills. Writing is an activity to express purposes, ideas, feelings and thoughts in written forms, using whatever skills and style that writers have developed personally. Writing is a productive skill that requires specialized skills. Students are expected to make an English composition by using good grammar. Therefore, it is acceptable that errors usually appear in written forms.

In relation to the writing ability, Spartt, Pulvernes, & Williams (2005, p.77) state that writing ability is divided into the linguistic ability and the communicative ability. The former refers to writers' ability in using correct vocabulary, grammar, capitalization and punctuation, spelling and mechanic. The latter refers to writers' ability in using language effectively and appropriately to select, organize

and order to relevant information and communication. To do this, the writers need to have enough ideas. They must be able to organize and express their ideas in an appropriate style for communicating.

The English teaching and learning process in Indonesian Junior High Schools is aimed to enable the learners to reach the functional level, i.e. to communicate in both spoken and written forms (Depdiknas, 2006, p. 9). In speaking, students have to be able to speak English fluently. On the other hand, in writing, students are demanded to be able to understand and even to produce some short functional texts, such as procedure, descriptive, recount, narrative, and report, related to their daily life.

In the English teaching and learning processes of writing, the students can learn many aspects of writing, so that they can produce sentences, paragraphs and texts by using English composition which is acceptable and grammatical. They can also convey their purposes, ideas, feelings and thoughts in written forms, so that they can improve and develop their writing abilities. Therefore, the writing teaching and learning processes are important for the students.

There is obvious that writing is one of the skills that must be learned by the students. However, after learning English for several times, Indonesian students, including the students in SMP N 2 Kalasan Sleman are not able to convey their purposes, ideas, feelings and thoughts in writing well. Based on pre observation that was conducted by the researcher at SMP N 2 Kalasan Sleman, there were several problems that appeared during the writing process. First, many students still had many difficulties to convey their purposes, ideas, feelings and thoughts in their written forms. They still found some difficulties to write English compositions which are acceptable and using good grammar. There are no free writing activities that can support the students to develop their writing abilities. The English teachers never asked their students to write freely on any topic to emphasize fluency. The exercises were given by the teacher just like multiple choices and filling blank texts. When students got their exercises written papers returned back to them, the teacher did not give feedbacks about the English compositions which were acceptable and using good grammar to the students. As a result, the students did not know how many errors in their grammar, vocabulary, spelling, punctuation, organization, and general cohesion and they could not develop their writing abilities from the teacher. The students just knew how many their writing scores without any detailed explanation. The Second, the teacher did not use effective methods to present materials and arouse the students' ideas and concepts easier. As a result, the students did not produce many words, sentences, paragraphs, and texts in English written forms and express their purposes, ideas, feelings and thoughts easier. Finally, the researcher found that the students' scores in English written forms were low.

Because of the importance of students' achievement and development in their English writing ability, it is the teacher's task to guide their students in the teaching and learning processes of writing. To do this, a teacher should be creative in presenting the materials. One way that can be used to improve students' ability is by using effective methods for teaching and learning processes. The use of effective methods can help students and teachers to build their interest and motivation. Appropriate methods can also create an effective classroom atmosphere in the teaching and learning processes. In the teaching of writing, the teachers must be able to use the appropriate method to help their students in overcoming difficulties in learning.

There are many effective methods that can support and motivate in the English teaching and learning processes, especially on writing. Two of effective methods are project-based learning and problem-based learning. Bender (2012, p. 7) states that project-based learning is one of the most effective ways available to engange students with their learning content. It is an exciting, innovative instructional format in which students select many aspects of their assignment and are motivated by real-world problems that can, and in many cases will, contribute to their community. Bell (2010) in Baş (2011, p. 2) defines that a project-based learning is an instructional method centred on the learner. Students develop a question and are guided through research under the teacher's supervision. A project-based learning as a systematic teaching method that engages students in learning essential knowledge and life-enhancing skills through an extended, students-influenced inquiry process that is structured around complex, authentic questions and carefully designed products and tasks (Mergendoller, Thomas, & Michaelson , 2006, p. 587). Ilter (2014, p. 2) also states that a project-based learning is a method which is based on scientific principles and encourages students to discovery learnings, enhances metacognitive strategies about the quality of life, results in realistic products following the authentic questions and topics. It constitutes excellent way to promote creative thinking, since the process leading

to the end-product of the project is not predetermined, but requires the students' active involvement and higher order thinking skills (Lakovos, 2011, p. 83).

Project-based learning is an instructional technique in which meaningful tasks, often in the form of problems; serve as the context and the stimulus for knowledge-building and critical thinking (Tiantong & Siksen, 2013, p. 204). Project-based learning changes the teacher-dominated instruction and move toward creating a student community of inquiry involving authentic communication, cooperative learning, collaboration, and problem solving. It challenges learners with real world problems to solve or questions to answer (Richard, 2002, p. 107)

Meanwhile, a problem-based learning is an instructional method that encourages learners to apply critical thinking, problem solving skill, and content knowledge to real-world problems and issues (Levin, 2001, p. 1). Problem-based learning is thus well suited to the development of key skills, such as the ability to work in a group, problem-solving, critiquing, improving personal learning, self-directed (Sulaiman, 2013, p. 7). Problem-based learning is a curriculum model designed around real-life problems that are ill-structured, open-ended, or ambiguous (Fogarty, 1997, p. 2). Project-based learning described as small group collaborative learning is a pedagogical approach that assumes the centrality of real-world problems to learning. It is aimed to empower learners by encouraging them to take a centre stage in learning and become independent self-directed learners (Hmelo-Silver & Barrows, 2006) in Ellizabeth (2012, p. 48)). Its advantages are well documented: students are known to develop greater communicative, thinking and problem-solving skills with problem-based learning than with regular lecture-based education.

Project-based learning and problem-based learning are still in the developmental stage. There are not sufficient research or empirical data to be able to state with certainty that project-based learning and problem-based learning are proven alternatives to other forms of learning. Based on evidence gathered over the past years, project-based learning and problem-based learning appear to be effective method for producing gains in academic achievement. One of the researchers is Elizabeth (2012). In her reports on an investigation into the problem-based learning on a first year undergraduate English for Specific Purposes (ESP) course in a Malaysian university described that initial analysis reveals that students welcomed the problem-based learning approach and the opportunity to take more responsibility for their learning. Tamim and Grant (2013) said that in their descriptive study about exploring of inservice teachers' definition of the project-based learning and their accounts on the meaning of their project-based learning also said that project-based learning as a teaching method that supports, facilitates, and improves the learning process. Meanwhile, Maesaroh (2015) in her research concluded that using PBL and PjBL model is effective to improve the higher order thinking skills of divergent pattern in senior high school students on the environmental pollution concept.

There are a lot of schools that still deals with problem related to students' writing achievement. One of them is SMP N 2 Kalasan. Therefore, it is chosen to be setting of this research. It is also considered appropiate to this research because project-based learning and problem-based learning have not been implemented in this school. Based on the theories and explanations above, a research related to the effects of project-based learning and problem-based learning is regarded to be necessary.

This research was designed to assess the effects of project-based learning and problem-based learning on writing achievement of the students of SMP N 2 Kalasan. In this section the problems can be formulated into the following questions: (1) Does the project-based learning affect on writing achievement of the students of SMP N 2 Kalasan Sleman in English learning like?; (2) Does the problem-based learning affect on writing achievement of the students of SMP N 2 Kalasan Sleman in English learning like? 3) Does the conventional learning affect on writing achievement of the students of SMP N 2 Kalasan Sleman in English learning like?; (4) Is there a significant difference in the writing achievement between students who are taught by using project-based learning, problem-based learning, and conventional learning?

In line with the formulation of the problem above, the objectives of the study can be described as follows: (1) To investigate the effect of the project-based learning on writing achievement of the students of SMP N 2 Kalasan Sleman in English learning; (2) To investigate the effect of the problem-based learning on writing achievement of the students of SMP N 2 Kalasan Sleman in English learning; (3) To investigate the effect of the conventional learning on writing achievement of the students of SMP N 2 Kalasan Sleman in English learning; (4) To investigate the difference in the writing achievement

between students who are taught by using project-based learning, problem-based learning, and conventional learning.

METHOD

This research is quantitative research. This study can be classified into quasi-experimental research. The research design is a pretest and posttest with quasi-experiment of groups which involves two groups of students who belong to the experimental groups and another group as the control group. In this research, it uses three groups, two group are given the treatments and the results are gathered at the end. The control group receives no treatment, over the same period of time, but undergoes exactly the same tests. The treatments given are the use of project-based learning and problem-based learning in the English teaching and learning processes.

This research was conducted at the students of grade eight of the junior high school of SMP N 2 Kalasan Sleman Yogyakarta in the academic year of 2014 /2015. It is located in Kalasan Sleman Yogyakarta. The population of the research was drawn from the students of grade eight of the junior high school of SMP N 2 Kalasan Sleman Yogyakarta in the academic year of 2014/2015. It is located in Kledokan, Selomartani, Kalasan, Sleman, Yogyakarta. There were six classes for the grade eight students. They were VIII A, VIII B, VIII C, VIII D, VIII E, and VIII F. The total number of the grade eight students was 192.

In this research, the sample of the research was three classes that were selected from the population, as the experimental groups and the control group which were randomly selected by applying a cluster random sampling.

The results of technique of the cluster random sampling resulted that the students of VIII E Class were applied as the experimental group 1 who was given project-based learning treatment, VIII F was applied as the experimental group 2, and students VIII D Class was applied as the control group which was given the conventional learning in teaching and learning processes. The control class (VIIID) consisted of 32 students, while the experimental class 1 consisted of 32 students and the experimental class 2 consisted of 32 students.

Research Variables

This research involved two variables, the independent variable and the dependent variable. The independent variable in this research was the method that was used to teach English writing, treatments. This variable was represented by X. They were project-based learning (X_1), problem-based learning (X_2) and conventional learning (X_3). Meanwhile, there was one dependent variable in this research. The dependent variable was the students' writing achievement which was represented by Y.

Procedures

In this research, the data were collected from the pretest and posttest of the experimental group 1 (VIIIE Class), the experimental group 2 (VIIIF Class), and the control group (VIIID Class). It was aimed to measure the students' writing ability of the groups before they were given the treatment. Then, the researcher gave the treatment of the project-based learning to the experimental group 1, the treatment of the problem-based learning to the experimental group 2, and the conventional learning to the control group. A Posttest was also given to the experiment group 1 (VIIIE Class), the experiment group 2 (VIIIF) and the control group (VIIID Class) to measure the students' writing achievement after the treatments were given. The researcher then compared the results of the experimental and control groups to find out the achievement of their writing ability.

Research Instruments

In this research, the research instrument that was used to collect the data was writing tests of writing skills which focus on text types. It was administrated before and after the treatment. The research instrument that was used in this research was a test of written composition. It is developed in reference to the School-Based Curriculum for Junior High School Year VIII of the English subject. The instrument was responsive writing tests of recount and narrative texts, in which the topics were based on the real life situation.

The testing of content validity was done by getting consultation with the expert judgment. After having correction by expert the instruments were tried out that was to test the instruments to students of

the second semester at SMP N 2 Kalasan Sleman who were not sample on this research. The total number of each test items of the pretest and posttest was two.

Reliability of the Writing Test

In this research, inter-rater reliability was used. Inter-rater reliability is established when the results of the writing test are assessed using subjective judgment. It is applied to know whether or not the data of the writing score that are given by two raters are reliable. The researcher was the first rater and the teacher as the second rater in students' score assessment. After the raters assessed the results, they were compared.

Data Analysis Technique

The techniques used to analyze the data in this research are descriptive analysis and inferential analysis. It is calculated by SPSS (Statistic Package for Social Science) version 17.00 for windows computer program. In a descriptive analysis, the analysis is aimed at presenting the variables of the English writing test, in the form of students' achievement score. The statistics were used in the computation are the mean and standard deviation. The inferential statistics used to test the hypothesis of the research on the relationship between the methods on one hand and the learning achievement on the other side. Before hypothesis testing, the requirement for normality, homogeneity and hypothesis testing is fulfilled.

RESULT AND DISCUSSIONS

Result

Data Description

The data description shows the results of the tests. This research employed three groups. It describes the test scores of the students in the experimental group 1 who were taught through project-based learning, the students in the experimental group 2 who were taught through problem-based learning and the students in the control group who were taught through conventional learning. The pretest and the posttest were utilized in each group. The pretest was given before the treatment and the posttest was given after the treatment.

The descriptive analysis is applied to provide the calculation of the mean, the standard deviation of the four variables, the highest score and the lowest score. The ideal mean and the ideal standard deviation are used to determine the score classification. In the categorizing the score, the researcher used the classification in the table of score category. The categorization of scores of students' writing ability was based on the ideal score.

Pretest

The pretest was given before the treatments. It was given to three groups, namely the experimental group 1 (VIIIE Class), the experimental group 2 (VIIIF Class) and the control group (VIIIC Class). It was aimed to measure the students' writing ability of the groups before it was given treatments. The students of the three groups were asked to write two texts; they were the recount and narrative texts and the length of each composition was at least 50 words. The result of the pretest for the experimental and the control groups can be seen as follows:

Data on the Pretest Writing Scores of the Experimental Group 1

The result of statistic calculation showed that the mean value was 25.47 with the standard deviation of 4.48, the maximum score for the pretest of the experimental group 1 was 40.00 and the minimum score was 19.00. The result of the descriptive statistics can be seen in Table 1.

Table 1. Descriptive Analysis of the Pretest on the Experimental Group 1

Mean	SD	Max Score	Min Score
25.47	4.48	40.00	19.00

Meanwhile, the students' score categorization of writing is based on the ideal score. The ideal mean score (Mi) was 30 and ideal standard deviation (SDi) was 6. The data shows that there was one student (3.1%) categorized into the very good category, four students (12.5%) were categorized into the

good category, 14 students (43.8%) were categorized into the poor category, 13 students (40.6%) were categorized into the very poor and no student (0.00%) was categorized into the excellent and extremely poor categories.

Data on the Pretest Writing Scores of the Experimental Group 2

The result of statistic calculation showed that the mean value was 25.06 with the standard deviation of 5.68, the maximum score for the pretest of the experimental group 2 was 42.00 and the minimum score was 14.00. The result of the descriptive statistics can be seen in Table 2.

Table 2. Descriptive Analysis of the Pretest on the Experimental Group 2

Mean	SD	Max Score	Min Score
25.06	5.68	42.00	14.00

Meanwhile, the result data of the score category on the students' writing test of the pretest score of the experimental group shows that there was one student (3.1%) categorized into the excellent and very good categories, two students (6.3%) categorized into the good and extremely poor categories, 16 students (50.0%) categorized into the poor category, 10 students (31.3%) categorized into the very poor category.

Data on the Pretest Writing Scores of the Control Group

The result of statistic showed that the mean value was 25.66 with the standard deviation of 3.33, the maximum score for the pretest of the control group was 31.00 and the minimum score was 18.00. The result of the descriptive statistics can be seen in Table 3.

Table 3. Descriptive Analysis of the Pretest on the Control Group

Mean	SD	Max Score	Min Score
25.66	3.33	31.00	18.00

Meanwhile, the result data of the score category on the students' writing test of the pretest score of the control group shows that there were four students (12.5%) categorized into the good and very poor categories, 24 students (75.0%) categorized into the poor category, and no student (0.00%) categorized into the excellent, very good, and extremely category.

Comparison between the Pretest scores of the Experimental Group 1, the Experimental Group 2 and the Control Group

When the pretest scores of the experimental group 1, the experimental group 2, and the control group were compared, there was difference. The comparison about the groups of students' writing ability scores in pretest is shown in Table 4.

Table 4. Descriptive Analysis of the Pretest Scores of the Experimental Group 1, the Experimental Group 2 and the Control Group

Data	No	Mean	SD	Max	Min
Experimental Group 1	32	25.47	4.48	40.00	19.00
Experimental Group 2	32	25.06	5.68	42.00	14.00
Control Group	32	25.66	3.33	31.00	18.00

Based on Table 4, there was a difference between the pretest scores of the experimental group 1, experimental group 2 and the control group when they were compared. The mean value of the pretest scores of the experimental group 1 was 25.47, the mean value of the experimental group 2 was 25.06, and the mean value of the control group was 25.66. The difference of mean value between the experimental group 1 and the experimental group 2 was 0.41, the difference of mean value between the experimental group 1 and the control group was 0.19, and the difference of mean value between the experimental group 2 and the control group was 0.60. The standard deviation of the pretest of the experimental group 1 was 4.48, the experimental group 2 was 5.68, and the control group was 3.33. The maximum and minimum scores of the experimental group 1 were 40.00 and 19.00, the experimental group 2 were 42.00 and 14.00, and the control group were 31.00 and 18.00.

Posttest

The posttest was given after the treatments. It was given to three groups, namely the experimental group 1, the experimental group 2 and the control group. The researcher gave the project-based learning in the English teaching and learning processes to the experimental group 1 and the problem-based learning to the experimental group 2, and the conventional learning to the control group. The posttest was given to the three groups to measure the result of students' writing achievement after the treatments were given. The students of three groups were asked to write two texts; they were the recount and narrative texts and the length of each composition was at least 50 words. The result of the posttest of the experimental group 1, the experimental group 2 and the control group can be seen as follows:

Data on the Posttest Writing Scores of the Experimental Group 1

From the computation, it shows that mean value for the experimental group 1 in the posttest was 31.63 with the standard deviation of 3.37, the maximum score for the pretest of the experimental group was 37.00 and the minimum score was 25.00. The result of the descriptive statistics can be seen in Table 5.

Table 5. Descriptive Analysis of the Posttest on the Experimental Group

Mean	SD	Max Score	Min Score
31.63	3.37	37.00	25.00

Meanwhile, the students' score categorization of writing ability is based on the ideal score. The ideal mean score (Mi) was 30 and the ideal standard deviation (SDi) was 6. The result data of the score category on the students' writing ability of the posttest score of the experimental group shows that there were six students (18.8%) categorized into the very good category, 16 students (50.0%) categorized into the good category, 10 students (31.3%) categorized the poor category, and no students (0.00%) categorized into the excellent, very poor and extremely poor categories.

Data on the Posttest Writing Scores of the Experimental Group 2

The computation shows that mean value for the experimental group 2 in the posttest was 28.88 with the standard deviation of 5.32, the maximum score for the pretest of the experimental group was 40.00 and the minimum score was 20.00. The result of the descriptive statistics can be seen in Table 6.

Table 6. Descriptive Analysis of the Posttest on the Experimental Group 2

Mean	SD	Max Score	Min Score
28.88	5.32	40.00	20.00

The result data of the score category on the students' writing ability of the posttest score of the experimental group 1 shows that there were five students (15.6%) categorized into the very good category, six students (18.8%) categorized into the good and very poor category, 15 students (46.9%) categorized the poor category, and no students (0.00%) categorized into the excellent and extremely poor categories.

Data on the Posttest Writing Scores of the Control Group

The result of statistic showed that the mean value was 27.47 with the standard deviation of 4.19, the maximum score for the pretest of the control group was 41.00 and the minimum score was 19.00. The result of the descriptive statistics can be seen in Table 7.

Table 7. Descriptive Analysis of the Posttest on the Control Group

Mean	SD	Max Score	Min Score
27.47	4.19	41.00	19.00

Meanwhile, the result data of the score category on the students' writing ability of the pretest score of the control group shows that there was one student (3.1%) categorized to the excellent category, eight students (25.0%) categorized into the good category, 19 students (59.4%) categorized into the poor category, 4 students (12.5 %) were categorized into the very poor category, and no students categorized into the very good and extremely poor categories.

Comparison between the Posttest scores of the Experimental Group 1, the Experimental Group 2 and the Control Group

When the posttest scores of the three groups were compared, there was difference. The comparison about the experimental and control groups of students' writing achievement scores in the posttest is shown in Table 8.

Table 8. Descriptive Analysis of the Posttest Scores of the Experimental Group 1, the Experimental Group 2 and the Control Group

Data	No	Mean	SD	Max	Min
Experimental Group 1	32	31.63	3.37	37.00	25.00
Experimental Group 2	32	28.88	5.33	40.00	20.00
Control Group	32	27.47	4.19	41.00	19.00

Based on Table 8, there was a difference between the posttest score of the experimental group 1, experimental group 2 and the control group. The difference of mean value between the experimental group 1 and the experimental group 2 was 2.75, the difference of mean value between the experimental group 1 and the control group was 4.16, and the difference of mean value between the experimental group 2 and the control group was 1.41. The mean value of the experiment group 1 was higher than the mean value of the experiment group 2 and the mean value of the experiment group 2 was higher than the mean value of the control group. It meant that the mean value of posttest of the experiment group 1 was the highest from the groups.

Comparison between the Experimental Group 1, Experimental Group 2 and the Control Group

When the mean value of the pretest and the posttest of the experimental group 1 were compared, there was difference. The mean value of the pretest was 25.47, whereas the mean value of the posttest was 31.63. The difference of mean value between post-test and pre-test from the experimental group 1 was 6.16. It means that there is a progress after treatment. The standard deviation of the pretest was 4.48, whereas the standard deviation of the the posttest was 3.37. The majority of the students' pretest scores were in the poor category (43.8%), whereas the majority of the students' the posttest scores were in the good category (50%). The descriptive analysis could be seen that there was a progress from the pretest scores to the posttest scores after the treatment through project-based learning.

The mean value of the pretest of the experimental group 2 was 25.06, whereas the mean value of the posttest was 28.89. The difference of mean value between post-test and pre-test from the experimental group 2 was 3.83. There is a progress after treatment. The standard deviation of the pretest was 5.68, whereas the standard deviation of the posttest was 3.33. The majority of the students' pretest scores were in the poor category (50.0%), whereas the majority of the students' posttest scores were in the poor category (46.9%).

Meanwhile, there was also a difference between the mean value of the pretest and posttest of the control group. The mean value of the pretest was 25.66, whereas the mean value of the posttest was 27.47. The standard deviation of the pretest was 3.32, whereas the standard deviation of the posttest was 4.19. The descriptive analysis could be seen that the students' writing ability scores of the control group after the treatment increased 1.81. The majority of the students' pretest scores were in the poor category (75%), whereas the majority of the students' posttest scores were into the poor category (59.4%).

Inferential Analysis

Test of Normality

The normality test is aimed to see whether or not the distribution of the responses to the instrument is normal. In this case, the researcher used a Chi-Square. The distribution is said to be normal if the score of the data distribution of the groups higher than 0.05. The Table 9 shows the summary of the normality test result.

Based on table 9, the results could be shown as follows: (a) the p value of the pretest of the experimental group 1 (0.679) was higher than 0.05. It meant that the data distribution of the pretest of the experimental group 1 had a normal distribution; (b) the p value of the pretest of the experimental group 2 (0.679) was higher than 0.05. It meant that the data distribution of the pretest of the experimental group 2 had a normal distribution; (c) the p value of the pretest of the control group (0.415) was higher

than 0.05. It meant that the data distribution of the pretest of the control group had a normal distribution; (d) the p value of the posttest of the experimental group 1 (0.524) was higher than 0.05. It meant that the data distribution of the posttest of the experimental group 1 had a normal distribution; (e) The p value of the posttest of the experimental group 2 (0.815) was higher than 0.05. It meant that the data distribution of the posttest of the experimental group 2 had a normal distribution; (f) The p value of the posttest of the control group (0.827) was higher than 0.05. It meant that the data distribution of the posttest of the control group had a normal distribution.

Table 9. Result of the Normality Test of Writing Ability

Variables	*df*	Sig.	Interpretation
Pretest of the Experimental Group 1	15	.679	Normal
Pretest of the Experimental Group 2	15	.679	Normal
Pretest of the Control Group	9	.415	Normal
Posttest of the Experimental Group 1	12	.524	Normal
Posttest of the Experimental Group 2	14	.815	Normal
Posttest of the Control Group	13	.827	Normal

Test of Homogeneity

A homogeneity test is used to find out whether or not the sample variance is homogenous or not. In this case, the *Levene*-Test was employed to analyze whether the sample variance is homogeneous or not on writing ability data. The test of homogeneity of variances can be considered homogenous if the probability significant value is higher than 0.05 significant (significant value > 0.05).
A homogeneity test was done in writing ability before and after the research which are pretest score and posttest score. This test was carried out by using SPSS version 17.00 for windows computer program. The results for *Levene-Test* are shown in Table 10.

Table 10. Result of Test of Homogeneity in the Pretest and Posttest

	Levene Statistic	*df* 1	*df* 2	Sig.	Interpretation
Pretest	2.090	2	93	.129	Homogenous
Posttest	2.356	2	93	.100	Homogenous

Based on Table 10, it shows that the value of *Sig*. of the pretest (0.129) was more than 0.05 (0.129 > 0.05), therefore it can be said that the sample variance was homogeneous. Moreover, the value of *Sig*. of the posttest (0.100) was also more than 0.05 (0.100 > 0.05), therefore it can be said that the sample variance was homogeneous.

Hypothesis Testing

The hypothesis testing is aimed to determine whether the increase in the students' writing ability scores through the project-based learning, the problem-based learning and the conventional learning is significant or not. The ANCOVA test therefore is used here. The hypothesis of this research is "there is a significant difference in the writing ability between grade eight students of SMP N 2 Kalasan Sleman who are taught by using project-based learning, problem-based learning, and those who are not."

Table 11. The Result of the Hypothesis Testing

Source	*df*	F	Sig.	Partial Eta Squares
Corrected Model	2	7.493	.001	.139
Intercept	1	4324.917	.000	.979
Class	2	7.493	.001	.139
Error	93			
Total	96			
Corrected Total	95			

The hypothesis testing between the experimental group 1, the experimental group 2 and the control group can be seen from the following explanation: (a) Null Hypothesis (H_o): there is no significant difference in the writing ability between grade eight students of SMP N 2 Kalasan Sleman who are taught by using project-based learning, problem-based learning, and those who are not, (b) Alternative Hypothesis (H_a): there is a significant difference in the writing ability between grade eight students of SMP N 2 Kalasan Sleman who are taught by using project-based learning, problem-based

learning, and those who are not. Table 11 describes the statistics of the scores of students' writing achievement.

Table 11 shows that the ANCOVA test has a significance value of 0.001. In other words, there was a significant effect of writing ability of posttest after controlling for the effect of pretest, F = 7.493, $p < 0.05$, then H_a was accepted and H_o was rejected or there was a significant difference in the writing ability scores between the students who were taught by using project-based learning, problem-based learning, and those who are not.

The result of the hypothesis testing showed that there was a significant difference in the students' writing achievement scores between students who were taught by using project-based learning, problem-based learning, and those who are not through controling the writing ability before the treatment. There are the summary of the result of hypothesis testing. It can be seen in Table 12.

Table 12. Summary of the Result of Students' Writing Ability Posttest Scores

Variable	N	Posttest	Adjusted mean
Experimental Group 1	32	31.625	31.625
Experimental Group 2	32	28.875	28.875
Control	32	27.469	27.469

Table 12 shows that the mean score of the posttest of the writing ability achieved by the experimental group 1 taught using the project-based learning was the highest between the mean score of the experimental group 2 taught problem-based learning and the control group taught by using the conventional learning. Because the means of the covariate or pre-test were not exactly same for the three groups, the means of the dependent variable or the post-test had to be adjusted. The adjusted mean on posttest students' writing ability for the experimental group 1 was 31.625, the experimental group 2 was 28.875, and the control group was 27.469.

Meanwhile, from the mean difference on the table above, it can be identified that: (1) Mean difference on post-test students' writing ability of groups which were taught by project-based learning and problem-based learning were 2.75, it meant that project-based learning was more effective than problem-based learning; (2) Mean difference on post-test students' writing ability of groups which were taught by project-based learning and conventional learning were 4.16, it meant that project-based learning was more effective than conventional learning; (3) Mean difference on post-test students' writing ability of groups which were taught by problem-based learning and conventional learning were 1.41, it meant that problem-based learning was more effective than conventional learning.

Discussions

With regard to the research done in SMP N 2 Kalasan, Sleman in class C, E and class F, each of which consists 32 students, it was found that there was a significant difference in the writing ability between students who are taught through project-based learning, problem-based learning, and conventional learning through controling the writing ability before the treatment.

Based on the data analysis, it showed that the mean value of the pretest and posttest of the experimental group 1 was compared, there was difference. The mean value of the pretest was 25.47, whereas the mean value of the posttest was 31.63. The difference of mean value between posttest and pretest from the experimental group 1 was 6.16. The mean value of the pretest of the experimental group 2 was 25.06, whereas the mean value of the posttest was 28.89. The difference of mean value between posttest and pretest from the experimental group 2 was 3.83. Meanwhile, there was also a difference between the score of the pretest and the posttest of the control group. The mean value of the pretest was 25.66, whereas the mean value of the posttest was 27.47. The difference of mean value between posttest and pretest from the control group was 1.81. It meant that the students belong to the experimental group 1 and the experimental group 2 had better promotion in writing ability than that of the control group. It can be said that using the project-based learning and the problem-based learning could improve students' writing ability. The project-based learning and the problem-based learning are more effective than the conventional learning. The project-based learning is more effective than the problem-based learning, or it can be said that the project-based learning is the most effective method in the writing teaching and learning processes.

According to the calculation of the normality test using SPSS version 17.00 for windows computer program, it was obtained that both the pretest and the posttest of the experimental and the

control group had a normal distribution. Based on the statistic calculation of the homogeneity test using SPSS version 17.00 for windows computer program, the pretest shows that the value of *Sig.* of the pretest (0.129) was more than 0.05 (0.129 > 0.05). Therefore, it can be said that the sample variance was homogeneous. Moreover, the value of *Sig.* of the posttest (0.100) was also more than 0.05 (0.100 > 0.05), therefore the sample variance can be said to be homogeneous. Table 13 describes the statistics of the scores of students' writing achievement.

Table 13. Test of Between-Subject Effect

Source	Type III SUM of Squares	*df*	Mean Square	F	Sig.
Corrected Model	286.021[a]	2	143.010	7.493	.001
Intercept	82544.010	1	82544.010	4324.917	.000
Class	286.021	2	143.010	7.493	.001
Error	1774.969	93	19.086		
Total	84605.000	96			
Corrected Total	2060.990	95			

From the ANCOVA result above, it is clear that the effect of treatments on students' writing achievement of the eighth-grade students of SMPN 2 Kalasan Sleman was in significance value 0.001. It means that the result of significance value of the ANCOVA test ($F = 7.493$, $p < 0.05$) was less than the significance level of 0.05 so that the null hypothesis (H_o) was rejected and the alternative hypothesis (H_a) was accepted. Statistically, when the significance value of the ANCOVA test < the significance level of 0.05, the null hypothesis is rejected and the alternative hypothesis is accepted or there is a significant difference, and when the significance value of the ANCOVA test > the significance level of 0.05, the null hypothesis is accepted and the alternative hypothesis is rejected or there is no significant difference. Based on the calculation, the significance value of the ANCOVA < the significance level of 0.05. Therefore, the null hypothesis was rejected and the alternative hypothesis was accepted. It could be concluded that the mean value on the posttest of writing achievement of the project-based learning, the problem-based learning, and the conventional learning were significantly different. It indicated that each method was significantly different.

Finally, the hypothesis proposed in this research which says "There is a significant difference in the writing achievement between grade eight students of SMP N 2 Kalasan Sleman who are taught by using project-based learning, problem-based learning, and those who are not" is accepted.

CONCLUSIONS

The conclusions of this research are drawn based on the result of the data analysis. Its presentation is in line with the research problem formulation stated in the previous chapter. Based on the previous discussion, the conclusions can be drawn as follows: (1) The result of the research indicates that the use of the project-based learning as a method in the teaching and learning processes of the experimental group 1 gives an effect on the students' writing achievement. It can be seen from the comparison between the pretest and posttest results. The students' writing score of the experimental group after the treatments achieves 6.16 points; (2) The result of the research indicates that the use of the problem-based learning as a method in the teaching and learning processes of the experimental group 2 gives an effect on the students' writing achievement. The students' writing score of the experimental group after the treatments achieves 3.83 points; (3) The result of the research indicates that the use of the conventional learning as a method in the teaching and learning processes of the control group gives an effect on the students' writing achievement. The students' writing score of the experimental group after the treatments achieves 1.81 points.; (4) There is a significant difference in the writing achievement between grade eight students of SMP N 2 Kalasan Sleman who are taught by using the project-based learning, the problem-based learning, and those who are not. The project-based learning and the problem-based learning are more effective than the conventional learning. Furthermore, it indicates that the project-based learning is more effective than the problem-based learning, or it can be said that the project-based learning is the most effective method in the writing teaching and learning processes.

REFERENCES

Badan Standar Nasional Pendidikan. 2006. *Panduan penyusunan kurikulum tingkat satuan pendidikan dasar dan menengah.* Jakarta: BNSP.

Baden, M. S, & Major, C. (2004). *Foundations of problem-based learning.* New York: Open University Press.

Baş, G. (2011). Investigating the effects of project-based learning on students'

academic achievement and attitudes towards English lesson. *Tojned: The online Journal of New Horizons in Education* - October 2011,Volume 1, Issue 4. Retrived on November 1, 2014. http/tojned.net/pdf/tojnedv01i04-01.pdf/

Bender, W.N. (2012). *Project-based learning: Differentiating instruction for the 21st century*. California: Corwin A Sage Company.

Elizabeth, M.A., & Zulida, A. K. (2012). Problem-based learning: A source of learning opportunities in undergraduate english for specific purposes. *The International Journal of Social Sciences.* November 15th 2012. vol. 3. No. 1. © 2012. TIJOSS & ARF Allrights reserved ISSN 2305-4557.http/www.tijoss.com/.

Fogarty, R. (1997). *Problem-based learning & other curriculum models for the multiple intelligences classroom*. Illinois: PEARSON SkyLight.

Ilter, I. (2014). A study on the efficacy of project-based learning approach on social education: Conceptual achievement and academic motivation. *Academia Journals.* (15), pp.487-497.

Lakovos,T. (2011). Critical and creative thingking in the English language classroom. *International Journal of Humanities and Social Science.* Vol.1 No.8. pp.181-193.

Levin, B.B. (2001). *Energizing teacher education and professional development with problem-based learning*. Alexandria,VA: ASDC.

Maesaroh. (2015). *The effectiveness of problem-based learning model and project-based learning model to improve higher order thinking skills divergent pattern in senior high school students on the environmental pollution.* Master thesis, unpublished. Yogyakarta: Universitas Negeri Yogyakarta.

Mergendoller, J. R., Thomas, J. W., & Michaelson, A. (2006). *Pervasive management of project based learning : teacher as guides and facilitators. Handbook of classroom management : Research, practice, and contemporary issues.* Mahwah, NJ: Lawrence Erlbaum, Inc.

Richard, J.C. (2002). *Methodology in language learning, an anthology of current practice.* Cambridge: Cambridge University Press.

Spratt, M, Pulvernes, A, & Williams, M. (2005). *The teaching knowledge test course*. Cambridge: Cambridge University Press.

Sulaiman, F. (2013). The effectiveness of PBL online on physics students' creativity and critical thinking: A case study at Universiti Malaysia Sabah. *International Journal of Education and Research* Vol.1 No.3.

Tamim, S.R., & Grant, M.M. (2013). Definitions and uses: Case study of teachers implementing project-based learning. *Interdisciplinary Journal of Problem-Based Learning.* Volume 7 | Issue 2 Article 3. Retrived on November 2,2014. http/docs.lib.purdue.edu/ijbl/vol7/iss2/3/

Tiantong, M & Siksen, S. (2013). The online project based learning model based on student's multiple intelligence. *International Journal of Humanities and Social Science.* Vol 3 No. 7.