



THE EFFECTIVENESS OF PROJECT-BASED LEARNING AND PROBLEM- BASED LEARNING MODELS TOWARDS GEOGRAPHY LEARNING OUTCOMES IN TERMS OF STUDENTS' LOCUS OF CONTROL

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Abstract

Nowadays, Indonesian's education seems to have an improvement in its quality. The government is establishing the 2013 curriculum. However, its implementation has not been well-implemented. In regard to this problem, it is necessary to apply scientific learning models: PjBL and PBL models. With these models and according to the students' locus of control, it is expected that it will improve students' learning outcomes. This study is aimed at determining the effectiveness of PjBL and PBL models towards learning outcomes in terms of the students' Locus of Control. The method used in this study was experiment, with 2x2 factorial design. The population was XI IPS students of SMAN 1 Ngaglik. The samples were 32 experimental students of PBL model and 28 experimental students of PjBL model. The data were collected using questionnaires and tests. The data were analyzed using Two Ways ANOVA. The result of the analysis shows that there is an influence between the models and students' locus of control towards the learning outcomes. The value of $F_{cal} 5.488 > F_{std} 4.00$ and the value of the probability is $0.023 < 0.05$.

Keywords: Project-Based Learning, Problem-Based Learning, Learning Outcomes, Students' Locus of Control.

1.Introduction

Purwanto (2009: 1) states that education is a program that involves several interrelated components in a process to achieve the goals that have been set. Then, Sani (2017: 1), asserts that education gives students the possibility to get opportunities and knowledge in order to gain a better life through better changes. The current education should be able to prepare students in facing the globalization, where students can be more active, creative, and innovative. However, the education in Indonesia is currently in the process of improving its quality. The government is implementing a new curriculum, namely the 2013 curriculum, with a scientific approach.

With regard to the issue of scientific approach, it has been implemented at various levels of school: in elementary school, middle school, and senior high school. It is stated by Saefudin & Berdiati (2016: 43) that scientific approach does not only focus on the learning outcomes as the main goal, but another important aspect is the learning process, therefore it is emphasized on the process. Further, in scientific approach, the students are required to be more active in the learning process. Thereby, its process is student-centered while the teacher acts as a facilitator, presents the materials, prepares a syllabus, designs the learning process, and coordinates students during the learning process.

With regard to the implementation of the 2013 curriculum, one of the important aspects to be prepared is the human resources, particularly creative and qualified teachers. In addition, another aspect is the fulfillment of the student learning facilities that can support the learning process. Yet, as found by the researcher, the implementation of the 2013 curriculum with a scientific approach has not been fully implemented. Some problems were found. First, the learning process was still teacher-centered. Second, the method of teaching and delivering the material was less attractive and still using the lecturing model, so that the students felt bored and less interested in the learning process. Third, the learning outcomes obtained by the students were still lack. As found by the researcher in SMAN 1 Ngaglik, the students obtained the mid test scores on geography subject were still below the minimum learning mastery standard (75.00), in this case, the average score of the students' mid test is 60.00. Therefore, to solve these problems, it is necessary to imply the scientific learning approach through Project-Based Learning and Problem-Based learning models on geography subject.

Sani (2013: 171) states that "Project-Based Learning refers to students designing, planning and carrying out an extended project that produces a public-exhibited output such as a product, publication, or presentation". In addition, Krauss & boss (2013: viii) claims that Project-Based learning model can create a meaningful learning experience which is easy to be remembered by the students, it is due to its notion that teachers not only provide learning material but provide concrete examples of real problems. Another point is asserted by Hosnan (2014: 202-203) that Project-Based Learning is a systematic learning model that involves students in the learning process and skill development through complex exploration processes and assignments, and produces a product at the end of the learning process. Further, Fathurrohman (2015: 119) defines Project-Based Learning as a learning model that uses a project or activity in the students' learning process for achieving the learning goals and fostering students' knowledge and skills.

Meanwhile, Problem-Based Learning (PBL) is a teaching model which tries to ensure that students learn by working together in a group to examine real life problems (Tok, 2016: 154). In this model, as emphasized by Duch, Groh, & Allen (2001: 6), the complexity of real life problems is used to motivate students for identifying and examining the concepts and principles in solving the problems. The students are set up to work together as a team, collaborate the collective skills in communicating, and integrate the information. Therefore, by implementing this interactive and innovative learning model, it is expected to improve students' learning outcomes. Last, Alavi (1995: 29) proposes that a structured processing framework is very beneficial for students at the beginning of the problem-based learning process, in other words, mastering the framework is as the first valuable point before beginning to engage in more complex problems that significantly lead them to their ability to make sophisticated clinical judgments before they graduate.

Hereinafter, it cannot be denied that, in one class, there are various kinds of students' characteristics. In accordance to the notion of 'Locus of Control', students' characteristics are divided into 'Introvert' and 'Extrovert'. Kreitner & Kinicki (2005: 155) asserts that:

“Locus of Control is Individuals who have an external locus of control tendency are individuals who have confidence that their performance is the result of events that occur outside of their direct control. the results achieved by the internal locus of control are thought to originate from his or her own activities. Whereas in the individual locus of control external consider that the success achieved is controlled from the surrounding circumstances. A person who has an internal locus of control will see the world as predictable, and individual behavior plays a role in it. In individuals who have external locus of control will view the world as something unpredictable, so also in achieving goals so that individual behavior will not have a role in it.”

To sum up, the implementation of an appropriate learning model which is in accordance to each student's Locus of Control is expected to improve students' learning outcomes. Therefore, this study is aimed at determining the effectiveness of Project-based Learning and Problem-based Learning models towards geography learning outcomes in terms of students' Locus of Control.

2. The Method

This study used experiment method, by utilizing the 2x2 factorial design. The population was all the students of SMAN 1 Ngaglik. The samples were 60 students of XI IPS class selected randomly, consisting of 32 students in the experimental group of Problem-Based Learning model and 28 students in the Project-Based Learning model. The instruments of the data collection were questionnaires and learning outcomes tests. The data were analyzed using Two Ways ANOVA, at the significance level $\alpha = 0.05$. The Two-

way ANOVA (Two Ways Analysis of Variance), as stated by Riduwan (2016: 222), is used to examine the comparison hypothesis consisting of more than two samples, in which each sample consists of two or more types conjointly.

3. Result And Discussion

Learning Outcomes Description

With regard to the learning outcomes, the data were obtained from tests which were in the forms of pre-test (before the treatment) and post-test (after the treatment). The test contains 10 multiple choice and 2 essay questions. The following is the results of the geography learning outcomes which are in the forms of pre-test and post-test on the group of students who were given Project-Based learning and Problem-Based Learning models in SMAN 1 Ngaglik;

Table 1. Data Description of Geography Learning Outcomes

Statistic Measurement	Project Based Learning		Problem Based Learning	
	Pretest	Posttest	Pretest	Posttest
Mean	74.28	81.25	69.84	77.50
Median	75.00	82.50	67.50	77.50
Modus	60.00	70.00	60.00	70.00
Maximum	95.00	95.00	90.00	90.00
Minimum	60.00	60.00	60.00	65.00
Std. Deviation	11.28	10.85	9.71	8.327
Sum	2080	2275	2235	2480
N-Gain	0.4009		0.2360	

Source: Data processed in 2018

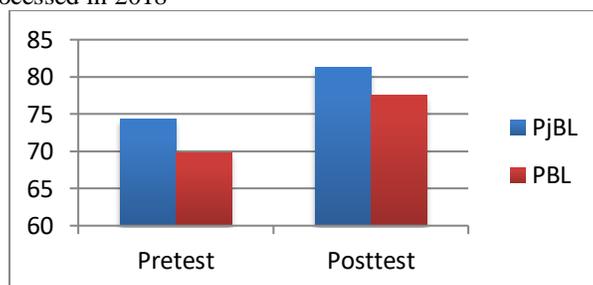


Figure 1. Average Curve of Geography Learning Outcomes of Project-Based Learning and Problem-Based Learning Models.

As shown in Table 1, the result of the students' pre-test before implementing Project-Based Learning model is: the *mean* of 74.28; the *median* of 75.00; the *modus* of 60.00; the *maximum* score of 95; the *minimum* of 60 (SD: 11.28). Mean while, the result of the post-test after implementing Project-Based Learning model is: 81,250 (*mean*), 82.50 (*median*), 70 (*modus*), 95 (*maximum* score), 60 (*minimum* score), and 10.85 (*standard deviation*). And, it also presents that the result of the pre-test before implementing Problem-Based Learning model obtains the *mean* of 69.84, the *median* of 67.50, and the *modus* of 60, where the maximum score is 90 and the minimum is 60 (SD: 9.71). Meanwhile, the result of the post-test after implementing Problem-Based Learning model shows improvements: the *mean* is 77.50; the *median* is 77.50; and the *modus* is 70, where the maximum score is 90, the minimum is 65, and the standard deviation is 8.32. To conclude, in accordance to the *mean*

score of the post-test, students gained a better improvement in the group that has been given the treatment of Project-Based Learning model which is an average score of 81.25.

Locus of Control (LoC) Description

With regard to the student’s LoC, it was considered through a questionnaire containing 15 questions, in which the student was asked to choose ‘yes or no’ answers. The following is the result of the LoC questionnaire test on the group of students who were given the implementation of Project-Based Learning and Problem-Based Learning models in SMAN 1 Ngaglik;

Table 2. **Data Description of Students’ LoC in SMAN 1 Ngaglik**

	<i>Project Based Learning</i>		<i>Problem Based Learning</i>	
	<i>Introvert</i>	<i>Ekstrovert</i>	<i>Introvert</i>	<i>Ekstrovert</i>
Frequency	11	17	14	18
Percent	39.3	60.7	43.8	56.3
N-Gain	0.2690	0.4863	0.2369	0.2354

Source: Data processed in 2018



Figure 2. Graphic Introvert and Ekstrovert Students’ LoC

It can be seen from the data in Table 2 that the group given the implementation of Project-Based Learning model consists of 17 extrovert students with a percentage of 60.7%, and 11 introvert students of 39.3%. As also seen in Table 2, the group given the implementation of Problem-Based Learning model consists of 18 extrovert students of 56.3% and 14 introvert students of 43.8%. These results come to draw a conclusion that most of the students in SMAN 1 Ngaglik given the implementation of Project-Based Learning and Problem-Based Learning models have extrovert personality, namely: 17 and 18 students.

Hypothesis Test Result

The interaction between the learning models and students’ locus of control toward geography learning outcomes is presented as follows:

Table 3. The Result of *Two Way ANOVA* Test between the Learning Models and Students’ Locus of Control towards Geography Learning Outcomes

Model	Average Score		Sum of Square	Df	Mean Square	F	P
	<i>Ekstrovert</i>	<i>Introvert</i>					
PjBL	87.64	76.36	362.36	1	362.363	5.488	0.023 < 0.05

PBL	78.05	76.78	3
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Source: Data processed in 2018

Looking at Table 3, it is apparent that the F_{cal} is higher than F_{std} , namely: $5.488 > 4.00$. In this case, H_0 is rejected whereas H_a is accepted, which means that there is an interaction between the learning models and students' locus of control towards the learning outcomes in SMAN 1 Ngaglik. And, the value of the probability is $0.023 < 0.05$. In summary, this result shows that there is an influence between the learning models and locus of control towards the students' learning outcomes.

DISCUSSION

Discussion

Problem Based Learning and Project Based Learning models are scientific learning models applied to the 2013 curriculum. The model encouraged students to play an active role in the learning process. Students were given the opportunity to do insight exploration, so that it could spur them to think creatively and innovatively. The application of the learning model was expected to improve student learning outcomes. The application of the learning model could be adjusted to each student's locus of control, both locus of control introvert and extroverted, so that the learning outcomes of students both introverted and extroverted could increase and the learning outcomes could be maximized.

The value of $F_{count} > F_{table}$ was equal to $5.488 > 4.00$, where H_0 was rejected and H_a was accepted, which means there was an interaction between the learning model and Locus of Control on student learning outcomes in SMAN 1 Ngaglik. The probability value between the learning model and Locus of Control on learning outcomes was equal to $0.023 < 0.05$, so it could be seen that there was an influence between the learning model and Locus of Control on student learning outcomes. Judging from the results of the mean, we could know that students who were given treatment with the application of the Project Based Learning model got a better value of 81.25. The majority of students had Extrovert Locus of Control both in the class given the application of the Problem Based Learning and Project Based Learning models as many as 17 students and 18 students.

The results of the study were in line with the research conducted by Noviarda (2015), which stated that there were significant differences in learning outcomes between students given treatment by applying the Project Based Learning model to students who were given the treatment by applying the Expository model. The results of the research from Prahesti (2017) were that there was an influence between the Problem Based Learning and Project Based Learning models on students' learning outcomes.

Susanti, Rahma & Monalisa (2017), explained that there were differences in mathematical problem solving abilities of students who had locus of control introverts with mathematical problem solving abilities that had extroverted locus of control. The mathematical problem solving ability of groups of students with locus of control introverts was better than the mathematical problem solving abilities of groups of students with extroverted locus of control.

The results of the study from Syatriadin (2017) were that students with locus of control introverts had better performance on average than extroverts. Pangestika (2015) stated that students with extroverted locus of control in the inquiry model group were more effective in improving geography learning outcomes. The results of the study from

Wicaksono (2016), which states that there was a significant effect of Problem Based Learning, Discovery Learning and Conventional learning models on geography learning outcomes on disaster mitigation and adaptation material in Wonogiri District Public High School.

Santria (2018), there was no difference in effectiveness between the project-based learning model and problem-based learning in terms of student achievement, mathematical communication skills and student interpersonal abilities. Maysara (2016), the results of this study indicated that with the application of the Problem Based Learning model to the subject of an effective colloid system with an N-gain score of 0.64 and the chemistry learning outcomes of students increased with the average score of 76.

Sari (2018), the results of the study were as follows: (1) There was a difference in effectiveness between the PjBL and PBL learning models for improving geography learning outcomes ($F_{\text{count}}: 6.746 > F_{\text{table}}: 4.00$), PjBL Model was more effective in improving geography learning outcomes, N-Gain: 0.4009 or medium category. (2) There was no difference in the effectiveness of geography learning outcomes between students applying the PjBL and PBL models in the LoC Introverted group ($T_{\text{count}}: 0.069 < T_{\text{table}}: 4.00$). The effective LoC introverted group was treated well with the PjBL and PBL learning models to improve students' learning outcomes, N-Gain: 0.2690 and 0.164 or low effectiveness categories. (3) There were differences in the effectiveness of geography learning outcomes between students applying the PjBL and PBL models in the LoC extroverted group ($T_{\text{count}}: 4.848 > T_{\text{table}}: 4.00$). LoC extroverted groups were more effectively treated with PjBL learning models to improve students' learning outcomes, N-Gain: 0.4863 or moderate effectiveness categories. (4) There was an interaction between the model and locus of control on learning outcomes ($F_{\text{count}}: 6.096 > F_{\text{table}}: 4.00$).

4. Conclusion

The third hypothesis states that there is an interaction between the models and students' locus of control towards the learning outcomes. The result shows that F_{cal} is higher than $F_{\text{std}}: 5.488 > 4.00$, in which the value of the probability is $0.023 < 0.05$. In this case, H_0 is rejected whereas H_a is accepted, which means that there is an interaction between the learning models and students' locus of control towards the learning outcomes in SMAN 1 Ngaglik. Judging from the post-test *mean* score, the students obtained better grades in the group that has been given the treatment of Project-Based Learning model, in which the *mean* score is 81.25. And, it is also found that most of the students of SMAN 1 Ngaglik have extrovert personality in the group which was given the treatment of Project-Based Learning and Problem-Based Learning models, namely: 17 students and 18 students.

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