



## The Effect of Problem-Based Learning and Project-Based Learning on the Achievement Motivation

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### Abstract

This study aimed to reveal: (1) the effect of PBL on the achievement motivation; (2) the effect of PjBL on the achievement motivation; and (3) differences of achievement motivation between the group taught using PBL and the group taught using PjBL. This study was a quasi experiment with the nonequivalent comparison group design. The population was grade V students of SD Negeri Lempuyangwangi in academic year 2016/2017. The data analysis used t-test and Univariate Analysis of Variance at the significant level of 5%. The result are as follows: (1) PBL improved positively and significantly on the achievement motivation; (2) PjBL improved positively and significantly on the achievement motivation; and (3) there is a significant difference on the achievement motivation between the group taught using PBL and that taught using PjBL.

**Keywords:** problem based learning, PBL, project based learning, PjBL, achievement motivation.

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### Introduction

The achievement motivation is a thing that needs to have particular attention in the implementation of education. The achievement motivation is important of the psychological factor in determines the success of academic and career in the future (Kołodziej, 2010, p.47). The achievement motivation defines as act and feeling on the effort to achieve the superiority standard (Henson & Eller, 2012, p. 378). The achievement motivation is a personal variable in which person successes on their work or learning depend on it, so the achievement motivation is an important factor and effective to increase the competency and personal productivity (Mahmoud, 2018, p16). The achievement motivation provides a contribution to increasing the learning outcome, and then the achievement motivation has the important effect on academic achievement and important component in the process of teaching and learning (Awan, Noureen, & Naz, 2011, p.75).

The achievement motivation is a fundamental capital for every individual student to achieve the dream. The achievement motivation, basically, has instilled within the students, and teacher has a key role to increase the achievement

motivation. The teachers' role as facilitator must facilitate the students to increase the achievement motivation. The achievement motivation might not directly teach but through an integrated process of students habitual in performing the training, including of the achievement motivation.

Motivation in the context of education, in existence, makes the mutual relationship with the learning process. And, they are complete one another, between the motivations and learning process built by the teacher. Motivation in learning also strongly determines the reaching of learning objectives. Students who have low achievement motivation will impact to not good of learning process. In contrast, the learning process also determines the quality of students' achievement motivation.

The good of the learning process will influence the high motivation of students. The inappropriate process also influences the low of students' achievement motivation. The process means the learning pattern conducted by teacher relating in applying the approach, method, strategy, and media used by the teacher to create the condition that can stimuli the students to have higher of achievement motivation. This study

more focuses on learning model applied by teachers.

Learning models that assume able to create the condition to increase the students' achievement motivation are problem-based learning and project-based learning. Those learning model teach the student to understand the problem, formulate the problem, finding the solution, examining the temporary answer by performing exploration, and ended with drawing the conclusion and presented both oral and written.

The problem-based learning model is a learning model to provide an opportunity for students to learn through the problems in everyday life. Problem-based learning can provide the opportunity to the student to work and find a solution from the real-life (Gregory & Champman, 2013, p.171). In problem-based learning, the student is bringing into a situation that leads them into a problem that must solve. The students learn through the act to solve the problem (Cheong, 2008, p.49).

The problem-based learning model is a learning model using the problem of real life as the foundation to implement the learning. Through the problem of real life, the students construct the knowledge in finding the solution and solve the problem. This learning model requests the students to more active in finding the information and exploration to solve the problem, and the teacher has a role as facilitator. Problem-based learning provides a real problem that often met by the student in their real life. By the real problem and student-centered learning, this learning encourages the students to blend more in the learning. By this encouragement, this learning is assumed as able to increase the achievement motivation. The real-life problem can make the students more motivated through the activity of exploration and discussion. The activity in problem-based learning makes the students have personal responsibility in completing the tasks, creatively work and full-heart in following the activity.

Project Based Learning model (PjBL) is a learning model using the project as a means in the learning implementation. Problem-based learning is an authentic learning that involves the authentic project, provide an interesting experience, and productive for students (Fogarty, 1997, p.78). Project-based learning is a teaching and learning strategy involving students in completing a project that has benefit for them to solve the problem in the middle of the community or environment (Sani, 2014, p.172). Project-

based learning is an approach that needs all classes or some of the students to take responsibility for their decision (Genc, 2015, p.106).

Problem-based learning and project-based learning model is the model of learning which has the problem as the foundation of learning, but the output is the differences between the two models. The output of problem-based learning is a solution to the problem, and the output of project-based learning is the product. Problem-based learning and project-based learning put the students at the center of learning. In both of models, the students require to search, find and analyze the information to formulate the exact concept in line with the learning objectives that relate to the problem in everyday life. The process of problem-solving which start from problem identification until problem-solving, encourage the students to perform the analysis process or evaluation of the problem. The active students' participation in problem-solving allows motivating the student in reaching the learning achievement.

Based on the background, the implementation of problem-based learning and project-based learning is assumed as having an influence on achievement motivation. In fact, the implementation of problem-based learning and project-based learning is not optimal yet in facilitating the increase of students' achievement motivation. The statement is proved by the result of pre-survey in SD (Public Elementary School) Negeri Lempuyanganwangi through observation.

Based on the observation on grade V at SD (Public Elementary School) Negeri Lempuyanganwangi on July 15, 2016, found that the teacher used problem-based learning and project-based learning. But, the problem based learning and project-based learning have not yet optimally implemented. The learning only uses problem, not use the problem of real life, like the character of problem-based learning. Moreover, the teacher is more dominant in explaining the concept. Also, the implementation project-based learning, the teachers are more dominant in explaining every step of product making, so that the students more listen to the teacher's explanation.

The result is not in line with the steps of the implementation of problem-based learning and project-based learning which supposes to provide the opportunity for students to construct the knowledge, not just listen to teacher's explanation. As the impact, the students' achievement

motivation that could develop through the learning model, but it does not develop optimally.

Based on the background, there are differences in the learning process in the school. The important aspect of learning such achievement motivation, have not developed by the teacher. Therefore, the article aimed to find out the effect of problem-based learning and project-based learning to achievement motivation of grade V students.

Based on the background, this study aimed to reveal: (1) the effect of problem-based learning on the achievement motivation; (2) the effect of project-based learning on the achievement motivation; and (3) differences of achievement motivation between the group taught using problem based learning and the group taught using project-based learning.

### Method

This study was a quasi-experiment with the nonequivalent comparison group design. The research conducted in grade V at SD Negeri (Public Elementary School) Lempuyangwangi. The research conducted on the even semester of the academic year of 2016/2017, which was on April 2017.

The population was all students in fifth grade at SD Lempuyangwangi, which total of students were 81 students. The students were spread into three classes; 27 students in class A, 26 students in class B, and 28 students in class C. The samples of this particular study were students of V B and V C, which has a total of 54 students.

The design in the particular study was nonequivalent comparison-group design (Johnson & Christensen, 2014, p. 358). In this design, two groups randomly selected and assumed that both groups have the same characteristics (homogeneous). Both groups were given a pre-test to determine the students' initial abilities. And then, they treated a certain treatment. Finally, they were given a post-test to find out the students' final abilities. The scale of achievement motivation in each group was compared and tested in the aspect of differences. If the scale between the two groups is different, then there is an effect of the treatment. The steps in this study were: (1) conducting pre-survey and applying for permission of the school, (2) making the instruments, validating the instruments, and testing the instruments, (3) conducting research surveys, (4) coordinating with teachers, (5) carrying out the pre-test, (6) carry out the learning with the problem based learning model and project-based

learning, and (7) carry out the post-test in both the two experimental groups.

Data collection technique used scales. In this study, the scale was used to measure the students' achievement motivation before and after the treatment.

Data analysis techniques used descriptive analysis and hypothesis test. Descriptive analysis used to display the data. The data obtained through pretest and posttest from the experimental class group in the form of the results of the scale of achievement motivation. Hypothesis test used the t-test and *Univariate Analysis of Variance*.

### Result and Discussion

#### Descriptive Analysis

The descriptive analysis aimed to describe the pretest and posttest data on achievement motivation between the two experimental groups. The data of pretest and posttest showed the conditions on the achievement motivation before and after treatment. The data on achievement motivation are presented in Table 1.

Table 1. Description of data on achievement motivation

Description	PBL	PjBL
Pretest	68,71	68,35
Posttest	80,96	88,15

Where:

PBL: *Problem Based Learning*

PjBL: *Project Based Learning*

Based on data in Table 1, it showed the changing of average value on achievement motivation after treatment with problem-based learning and project-based learning.

#### The Result of Hypothesis Test

Table 2 presented on the results of hypothesis test.

Table 2. The result of t-test on achievement motivation with problem based learning

PBL	Mean	t-count	P
Pre-test	68,71	13,322	0,000
Post-test	80,96		

Based on Table 2, the average score on achievement motivation using problem-based learning on pre-test obtained 68.71, and post-test obtained 80.96. The data showed that there changed on the average score of pre-test and post-test achievement motivation with problem-based learning. The changing is seen from the increase-

ing the average score after treatment. In sum, there was an effect of problem-based learning on achievement motivation. Moreover,  $t_{count} = 13.322$  and  $P = 0.000$ ;  $P = 0.000 < 0.05$ ; means,  $H_0$  rejected. In sum, concluded that problem-based learning has a positive and significant effect on achievement motivation.

Table 3. Results of the MB t-test with PjBL

PjBL	Mean	t-count	P
Pre-test	68,35	28,407	0,000
Post-test	88,15		

Based on Table 3, the average score of achievement motivation using project-based learning, pre-test obtained 68.35, and post-test obtained 88.15. The data showed that there change on the average score of pre-test and post-test achievement motivation using project-based learning. The change in increasing was seen from the average score after treatment. It showed that there is an effect of project-based learning on achievement motivation. Moreover,  $t_{count} = 28.407$  and  $P = 0.000$ ;  $P = 0.000 < 0.05$ ; then  $H_0$  rejected. In sum, concluded that project-based learning has a positive and significant effect on achievement motivation.

Table 4. Test Result of *Univariate Analysis of Variance Post-test* on Achievement Motivation

Class	Mean	F-count	P	R Square
PBL	80,96	53,262	0,000	0,506
PjBL	88,15			

Based on Table 4, the average score of post-test on achievement motivation of the problem-based learning group obtained 80.96, and the project-based learning group obtained 88.15. The data showed the differences in the average score on achievement motivation between the problem-based learning and project-based learning groups. The differences were seen from the higher score achievement motivation of project-based learning group than the problem-based learning group. Besides that,  $F_{count} = 53.262$  and  $P = 0.000$ ,  $P = 0.000 < 0.05$ ; then  $H_0$  rejected. In sum, concluded that there is a significant difference in achievement motivation of problem-based learning (PBL) and project-based learning (PjBL).

The result of the  $R^2$  test obtained 0.506. This showed that achievement motivation influenced by the model of problem-based learning and project-based learning which is 50.6%. Meanwhile, 49.4% influenced by other factors which do not include in this study.

## Discussion

### *Problem-Based Learning (PBL) toward achievement motivation*

The results showed that problem-based learning had an effect on student achievement motivation. Students will have the motivation to achieve achievements when dealing with a real problem. This finding is in line with Thakur & Dutt (2017, p. 103), stated that Teachers, schools, classrooms, family, and communities play an important role in developing the students' achievement motivation. If learning is always associated with real-life problems into a classroom situation, then it can improve the students' achievement motivation. Daily problems as the topic of learning will make the students more enthusiastic in understanding the learning. This occurs because the problem found directly in the environment. In this case, the students may involve in discussions actively to share opinions and ideas to solve the problem. In line with Kodariyati & Astuti (2016, p. 102) stated that class discussions encourage students to share ideas or thought. The active student involvement makes the students having the motivation to always achieve an achievement.

Shamsan & Syed (2009, p.250), also stated that problem-based learning is a learning process in the classroom, which uses real-life problems to motivate students to identify and apply research concepts and information, work collectively and communicate effectively. The purpose, besides being able to develop cognitive skills and aspects, it is also to familiarize students in developing their affective abilities.

Problem-based learning is a learning model that facilitates students to engage in learning activities. Problem-based learning presented real-life problems that are often encountered by students in daily lives. In addition, students in problem-based learning become the center of learning (student-centered), and teachers act only as a facilitator. Through real-life problems and student-centered learning, the learning makes students having the motivation to participate in learning. The motivation showed that problem-based learning assumed as able to increase learning achievement motivation. Supported by Sukri & Widjajanti (2015, p.231), motivation occurs when a person has the motivation to carry out an activity or action to achieve the goal. Furthermore, Duch, Groh, & Allen (2001, p.6) stated that in the implementation of problem-based learning, complex real-life problems may

use to motivate the students to identify and examine concepts and principles that they must understand. This statement reinforces the statement that problem-based learning can increase student achievement motivation.

*Project-Based Learning (PjBL)* toward the students' achievement motivation.

The finding of research showed that project-based learning had an influence on student achievement motivation. This finding is in line with Turner's opinion (2012, p.32) stated that project-based learning motivates students to use critical thinking skills in project planning, collaborative problem solving, and higher-order thinking skills. Active involvement of students in learning which begin with planning to evaluate project results makes students more enthusiastic in completing tasks.

Behizadeh (2014, p.100) stated that project-based learning often begins with questions to the student by the teacher. Then, it allows students to answer the questions by being involved in a project. In addition, Bender (2012, p. 8) stated that project-based learning can be defined as authentic learning, using real-world projects, using highly motivation and interesting questions, assignments or problems to teach learning content in the context of working collectively to solve problems. Furthermore, Habók & Nagy (2016) stated that the project must ensure that students conduct research and work collectively in order to improve problem-solving skills, motivation, and creativity. The projects that conducted by students are a project which allows them in giving an opportunity to conduct investigations and working collectively to solve the project. In addition, student involvement in the completion of the project made them more enthusiastic in completing the task. In line with the opinion of Yastika & Haryanto (2016, p.114), project-based learning method involves students from the beginning of project activities. Students will be motivated to give opinions, though, or ideas to carry out the projects. This opinion supports the theory that project-based learning can improve student achievement motivation.

*Differences in Achievement Motivation of Groups treated using Problem-Based Learning (PBL) and Groups treated using Project Based Learning (PjBL)*

The finding of research showed that there were significant and positive differences in achievement motivation between the group

treated with problem-based learning and project-based learning. The results also showed that achievement motivation on project-based learning was higher than problem-based learning group..

There are differences on achievement motivation between students treated using problem-based learning and students treated using project-based learning. This finding is caused by some activities of project-based learning encourage students involving into a motivated situation. For example, the activities of project determination encourage students to have an interest in various problems and solve problems. In line with De La Paz, & Hernández-Ramos (2013, p3) stated that one of the objectives of project-based learning implementation is to facilitate students to learn on how to learn through situations more similar to the real world, and dealing the problems and issues exceed their textbook.

Furthermore, persistence and energetic in searching for a creative way to complete tasks are also fulfilled through the design of completion steps. In the activity of preparing the project implementation schedule, it can facilitate each activity properly and always prepare all learning needs. In line with Chun-Ming, Hwang, & Huang (2012, p.370) stated that aiming to reach effective learning activities with project-based learning, it is necessary to design learning tasks to stimulate learning motivation and improve student learning achievement. Student achievement motivation in problem-based learning is lower compared to project-based learning because only a few stages of problem-based learning can facilitate the students' achievement motivation.

This finding is in line with Westwood (2008) on an advantage of the project-based learning model, which are the students are required to be responsible for their learning, thereby increasing self-direction and motivation. Active involvement of students in learning begins with planning to evaluate project results which make students more enthusiastic in completing tasks. Projects on students are projects that give the opportunity to conduct investigations and work collectively to solve the problem. In addition, student involvement in the completion of the project made them more enthusiastic in completing the task.

## **Conclusion**

Based on the result of hypothesis test and discussion, it concluded that (1) problem-based

learning has an effect on achievement motivation of students on fifth grade elementary school; (2) project-based learning has an effect on achievement motivation in students on fifth grade elementary school; and (3) problem-based learning and project-based learning have different influences on achievement motivation in students of fifth grade elementary school.

Based on the conclusions, then proposed suggestions: the teacher can use problem-based learning model and project-based learning as an alternative learning in developing/improving achievement motivation; aiming to achieve maximum result in using either problem-based learning model or project-based learning are designing LKS (worksheet) in accordance with the learning steps of PBL or PjBL; carry out similar research on themes, classes, schools and even different scientific fields to ensure the usefulness of using problem based learning models and project-based learning models which aim to improve the quality of education in the future; and carry out research to examines the effect of problem based learning and project-based learning models using different dependent variables in order to provide more information related the effect of problem based learning and project-based learning models.

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