



Evaluation of Project Based Learning Model Trough online Settings to Increase Science Learning Outcomes

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Abstract

During the corona virus pandemic (covid-19) learning existing in the 2013 curriculum must be implemented. The study is to evaluate the increase of students' learning through the PJBL project based learning model with the online setting on science subjects for 5 grade of elementary school. This study is classroom action research with two cycles. The population in the study amounted to 21 and the sample used using the saturated sample. The Instruments in this study were observations and tests of students' learning results. The data collected techniques in this study application were for observation taken by the supervisor, namely the elementary school teacher and also student science test results. The data analysis technique in this study was descriptive and N-gain analysis. The results showed increases in the average result of study and achievement. In the N-gain test, the increase was in moderate categories. It is absorbed by the use of a PJBL with an online setting on a science class lifts everyday life materials so it is easier for the student to run a work project that enhances his studies. Therefore, the PJBL in this research was well implemented.

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INTRODUCTION

The results of PISA 2018, which states that Indonesia ranks 70 out of the 78 countries following the program (OECD, 2019). This is because of the less treat of stimulus given to the students for high levels at school (Rochmad, 2020). Aside from the still low result of PISA, the global problem was the corona virus pandemic (covid-19).

According to Etikasari, Puspitasari, T, Kurniasari, A, & Perdanasari (2020) Novel Coronavirus (Covid-19) is a disease with faster transmission rate. Mustikaningrum (2020) states that the impact of Covid-19 on education in Indonesia is that process learning activities terminated in schools and turned into online learning activities. Therefore, even though it is affected by the Covid-19 pandemic, it is hoped that teachers will still be able to implement optimally generated reproductive activities using online learning models.

The learning model in the 2013 Curriculum must include the values of attitudes, knowledge, and skills (Kurniaman, 2017). Additionally, improved quality of education in Indonesia is characterized by the implementation of the 2013 curriculum (K13) which aims to prepare Indonesian people to have the ability to live as individuals and faithful, productive, creative, innovative, and detective citizens and to contribute to social, national, domestic, and global development (minisdikbud, 2018). Therefore, even during the corona virus pandemic, the recommended learning model from the 2013 curriculum must be implemented. In fact, the learning activities carried out by the teacher are still limited to conveying information using the lecture method, which ultimately makes students tend to be passive and less exploratory, so that the development of student learning results is not optimal (Abdulmajid, 2017).

In practice, based on the results of observations made by researchers at State Elementary school of 01 Anggrasmanis in Karanganyar Regency, when learning was

taking place, it appeared that the teacher was not maximal in implementing the 2013 curriculum with an innovative creative learning model and the teacher was not integrating various subject matter into existing into the established theme. Furthermore, the results of interviews with class teachers, resulted that teachers still had difficulty doing online learning. This is because teaching using the online method has never been done by the teacher, so the teacher is still confused about using the right learning model.

The purpose of the 2013 curriculum must be implemented, so a solution to the teaching learning activities process of teaching and learning activities is needed in order to accomplish its purpose. Therefore, this research offers an online-based learning model that is integrated with project based learning (PjBL). With project-based learning, students' knowledge is better in terms of remembering, applying knowledge and better understanding of concepts than teachers using listening to the lecture method in class (Sari, et al. 2017). The conditions that are felt when learning using project-based learning stimulates students to be active and creative which will gradually accumulate positive attitudes of students in developing creativity (Zhou, 2012).

Project-based learning not only makes products but also learns to emphasize the process of learning, how students understand every concept by making something, so that student understanding will be rooted in memory (Bahri, 2017). Therefore, PjBL feels that it can improve the results of learning online learning.

Online learning that was implemented suddenly due to the Covid-19 pandemic has its own advantages, one of which is following the developments of the 21st century (Garcia-Alberti, 2021; Mishra, 2020 & Dong, 2020). The use of Information and Communications Technology (ICT) in the learning process of the study uses the habits applied in State Elementary School of 01 Anggrasmanis. This is done so that students do not adapt anymore. The ICT used in this study is to form the Whatsapps Group (WA). WA is one

of the social media companies that can create groups for activities.

According to Handayanto (2018), online-based learning can increase the interest, participation, and learning results of students. In addition, Sokolowski (2015) in his study suggests that computer media can give students the opportunity to explore mathematical concepts and can improve math problem-solving skills. Therefore, the use of ICT on learning is needed in order to provide a new atmosphere in the teaching and learning process. The use of ICT to support learning has been implemented in various schools, both at the junior high school and senior high school. The studies have been made in conjunction with the implementation of ICT in several schools (Zyainuri, 2012; Pratiwi, 2014 & Hardayanto, 2016). With the results of using the internet, it can also send out a set of solutions that can increase knowledge and skills (Vaughan & Jim, 2016).

From the above problem, this study aims to evaluate whether the PjBL model can improve students' learning results on natural science subjects.

METHODS

The study used classroom action research using 2 cycles. The population of this study was 5 grade students of State Elementary School of 01 Anggrasmanis semester II in the academic year 2020/2021 with 21 students. The taking of a sample in this study was using saturated samples or all populations were sampled so that 21 students were obtained as samples.

This study used an instrument of student learning results of as many as 20 questions. Previously, the instrument was validated using the validation content and constructed validation with the results of the question instrument using minor revisions. The instrument testing was followed by grade 6 students and it was found that the Cronbach Alpha or reliability test had a result of 0.71, which means that the instrument of the science learning result was reliable.

This study used observation data collection techniques and assessment of science learning results. The data analysis technique used is descriptive analysis and N-Gain test. Furthermore, if the descriptive analysis and N-gain test and student learning results increase and on the observation of class activity assessments more than 75%, PjBL learning is successfully implemented.

RESULTS AND DISCUSSION

The results of the research that has been employed, begin with the observation of student learning results in science subjects. It used 20 questions on the subject. The results of the observations were the results before PjBL was used with online Settings. Table 1 below is the result of the observations on this research.

Table 1. The result of observation

Type	Results
Total of student	21
Average of learning result	64,6
Deviation Standard	8,5
Total of students completed	4
Total of students uncompleted	17

Based on Table 1, it shows that the results of observations more than 50% of students have not completed the science subject because the average obtained is 64.6 while the minimum completeness employed at school is 70. Based on the low results in observations, the increase in science learning results in this study used PjBL through online settings. The steps used in this research were project completion, compiling a project implementation schedule, working on project assignments through experiments and making trial reports, asking questions, answering questions, having opinions when presenting project results or publications and evaluating project processes and results of the project. Even though this is employed online through WA.

The results of learning by students were in science lessons after being implemented

learning using PjBL with online settings entered in cycle I and cycle II. The results of learning after being given the treatment were presented in Figure 1 below.

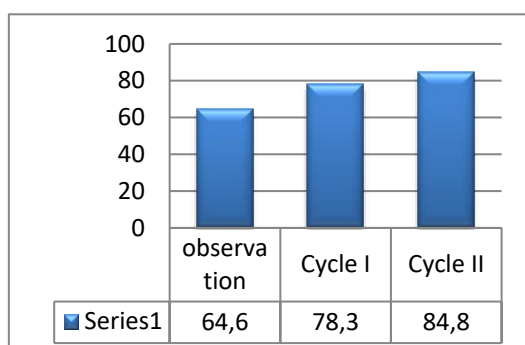


Figure 1. Science Learning result

The result of Figure 1 showed that at the time of observation before employing the PjBL learning is through online settings, the average did not fulfil the minimum criteria of 70. In cycle I and cycle II, the average results of students' learning using PjBL through the online setting already exceed minimum criteria.

PjBL through the online setting not only increases the average student's learning results, but the number of students completely also increases. The following table 2 was the obvious result of students' achievement.

Table 2. The Result Completeness of Students on PjBL Through Online Settings

Fase	Total of Students Completing	Total of Students Uncompleting	Percentage of Completeness
Observation	4	17	19 %
Cycles I	12	9	57 %
Cycles II	17	4	81%

It is shown in Table 2 that the number of students who completed after using PjBL through Online settings all exceeded 50%. So the use of PjBL with online settings not only increases the score of learning results scores but also the number of students' completeness.

The increase in student learning results in science subjects occurring partly because of

active student involvement and teachers can teach well. In the assessment employed on PjBL by the supervisor, namely the class teacher with a Likert scale questionnaire 1-5 with a total of 20 statements with the distribution of 10 statements each for each assessment, the results obtained in Table 3 are as below.

Table 3. The Result of Activity on PjBL

Phase	Teaching Assessment Score	Student Activity Score
Cycles I	42	39
Cycles II	45	40

It is shown in Table 3. After completing cycle I and cycle II, there is an increase in the teaching assessment score of 3 out of 4 scores or 6%. The percentage obtained in the teaching assessment has reached 75% because in the first cycle it was 84% and in the second cycle it was 90%. Besides that, the percentage of student activity also increased. In cycle I to cycle II, the score of student activity increased by 4% and at the minimum, the percentage of student activity got a score of 78%. This

means that the percentage of student activity in participating in PjBL through Online settings exceeds 75. %. At the notes given by the supervisor in the first cycle of student activities that have not been employed properly were making project assignment reports and presenting the results of the report. After a teacher's improvement in the II cycle, an improvement in which learners become active in creating project results reports and

presenting reports and responding to presentations presented by their friends.

The Results are Obtained as Below:

$$N - gain = \frac{\text{mean Siklus 2} - \text{mean Observation}}{100 - \text{mean Observation}}$$

$$N - gain = \frac{84,8 - 64,6}{100 - 64,6} = 0,57$$

The result of the N-gain score above, which is 0.57, means that the criteria for student learning result in science students have increased in the moderate category. Based on the analysis of the observations to the second cycle, there is an average increase in the scores of students' learning results.

There is an increase in learning results because the teacher provides questions that foster the remaining concentration to enter learning. In addition, the presentation is a daily question that makes it easier to construct student knowledge. This stage is the first step for students to observe more deeply the questions that arise from the surrounding environment, thus allowing for ideas in project building. The project employs teachers and students who discuss project-based regulations, as well as tools and materials to be used to complete a project online.

Apart from this, the increase occurred because activities are due regularly. Furthermore, activities in completing the teacher and student project together make good use of the time possible and regarding the target time for implementation. The right time to employ the project makes students' discipline and cognitive knowledge also increase over time. In the creation of a teacher project, it does a monitor of students' activities during the completion of the project. The monitoring is employed by facilitating the students in each process. With this, the video recording activity during the project is always employed by students. These things make learning results in science subjects. Students have increased.

This increase is because PjBL setting is in concert with science learning, because science should emphasize direct experience to develop their scientific skills. In science study,

it directs students to self-study so that students are able to gain their own understanding. The science study in the learning process directs projectile-based activities so that it can improve cognitive and student skills.

In addition, project learning is able to involve students actively in the learning and the process of obtaining information based on the new experiences they have had. Good learning is learning that involves students directly in the learning process (Sumarni, 2019). Furthermore, according to Insyasiska (2017), students who play a major role in student project learning can solve problems independently. On the science study using PJBL with a online setting at State elementary School of 01 Anggrasmanis, it emphasizes providing direct experience to develop competencies in order to understand the natural surroundings scientifically. This is because natural science is needed in daily life to meet human needs through the solution of identifiable problems (Wellyanti, 2020). The implementation of science learning is carried out by combining science learning with project-based learning directly related to students 'daily lives, making students' ability to identify daily life - to be more critical in thinking (Anggareni, 2012).

In addition to this, the integration of PjBL with online learning that has been employed makes student activities monitored while employing projects. In other words, technological advances can make it easier for teachers to guide students in distance learning (Putra, 2017 & Ngafifi, 2014). Technology can help teachers to prepare students for real-world conditions. The rapid development of ICT can make students explore information more broadly and practically. In learning, the use of technology can motivate students to solve routine problems or even memorize (Yang, 2012; Licorish, 2018).

The Study that shows that PJBL can increase student learning results in line with the research from ridlo (2020); Guo (2020); Dole (2017) & Musa (2012) which states that PJBL constructs student knowledge the way practice makes simple projects in daily life.

Furthermore, the increased learning yields in the moderate category because of studying only four times, so that students' learning results have not shown results at high levels. This is in line with research from Ulinnuha (2019); Rochmad (2020); Mulyanto (2020) which states that it takes a long time to improve students' abilities in the high category. In addition, according to Hadromi (2021) learning with projects or guided by work skills makes students active in learning. Therefore, the results of learning using PjBL can increase the output of learning.

CONCLUSION

The PjBL application through online setting can increase the result of learning science in science subjects. Not only the average student in the learning result, but also the proportion of student completeness also increased. This is because the activity of students in high-based projectile-based learning as well as of high-grade increased tests was being met in a moderate category. Therefore, the use of PjBL is considered good for science subjects. Furthermore, it is hoped that the use of the PjBL learning model with an online setting can continue to be used in the learning process in the classroom not only in science subjects because it can improve students' cognitive abilities.

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