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DEVELOPMENT OF PROJECT BASIC LEARNING (PBL) IN ORDER TO IMPROVE STUDENT LEARNING OUTCOMES IN SCIENCE CURRENTS

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ABSTRACT

This study aims to investigate the effect of the Project Basic Learning (PBL) learning model on student learning outcomes in science subjects in class VI SDN Utan Kayu Selatan 01 Jakarta for the 2021/2022 academic year. This research is action research with two rounds. Each cycle consists of four stages, namely design, activity and observation, reflection, and revision. The target of this research is the students of class VI SDN that the student learning outcomes have increased from cycle I to cycle II, namely, cycle I (51%) and cycle II (89%). This study concludes that the Project Basic Learning (PBL) learning model has a positive effect on the learning outcomes of students at SDN Utan Kayu Selatan 01, East Jakarta, and this learning model can be used as an alternative to learning science.

INTRODUCTION

Science (science) is taken from the Latin word scientia which literally means knowledge. Sund and Trowbribge formulated that science is a collection of knowledge and processes. Meanwhile, Kuslan Stone states that science is a collection of knowledge and ways to obtain and use that knowledge. Science is a product and process that can not be separated. "Real Science is both product and process, inseparably Joint" (Suci, 2018).

Science as a process is the steps taken by scientists to conduct investigations in order to find an explanation of natural phenomena. These steps are formulating problems, formulating hypotheses, designing experiments, collecting data, analyzing and finally concluding. From this it appears that the fundamental characteristic of science is quantification, meaning that natural phenomena can be in the form of quantities.

Science in the Curriculum System in Indonesia is included in Natural Science (IPA) lessons in the 2013 Curriculum content. These are subjects that have an important role in developing all aspects of the ability level of students in the learning process, this is because science is part of the subjects developed based on achievement of three aspects, namely knowledge, attitudes and skills, so that with the development process for these three aspects, science has a very important role, especially in developing students' scientific abilities, attitudes and skills. The study is in accordance with the regulation of the Minister of Education and Culture Number 57 of 2014 Article 5 Paragraph 2 (2014: 3) regarding the basic concepts of science subjects, namely the general subjects of Group A as referred to in paragraph (1) letter a, which is a curricular program that aims to develop competence attitudes, knowledge competencies, and competency skills of students as the basis and strengthening abilities in the life of society, nation and state.

Natural Science and Technology globally has undergone various developments. This can be seen and felt in everyday life that occurs in the environment around us. Basically, science aims to prepare students to be responsive to their environment, because by learning

science students learn to understand natural phenomena that occur in their environment. In line with that (Samatowa, 2006) suggests that by learning science, it can improve the ability of students towards good attitudes and abilities and is useful for the environment.

From some of the objectives of learning science that have been stated previously, it appears that the results of learning science are expected to be reflected in the ability of students to behave and behave well, in understanding natural phenomena that occur in their environment.

Teachers have an important role in the success of the science/science learning objectives themselves. So that teachers must be able to mix science learning into subjects that are liked by students and develop their talents and potential. The role of the teacher as a facilitator is needed in science learning and students become the center of learning (student center). Learning model that attracts students to like science subjects. By liking the lesson will automatically lead to learning motivation of students. This motivation has an impact on increasing student learning outcomes.

However, in reality, science learning is still classical and conceptual. This resulted in a decrease in students' interest in science subjects. The learning model delivered is still one-way. The teacher is the main source of learning (teacher centre). So that learning is monotonous, students tend to be lazy to follow teaching and learning activities.

The scores of sixth graders (VI) at SDN Utan Kayu Selatan 01 from the results of the first odd semester daily test held in early August 2021 showed that the level of student mastery of science subjects was still low. This can be seen from the analysis of learning outcomes which show that 50% of the 30 participants scored below the KKM. The minimum KKM that has been determined by the education unit at SDN Utan Kayu Selatan 01 is 70 (seventy) for science subjects.

Based on the above observations, the authors are interested in conducting a classroom action research entitled "Improving Science Learning Outcomes for Class VI through Project Basic Learning (PBL) for Students at SDN Utan Kayu Selatan 01 Matraman District, East Jakarta, Academic Year 2021/2022".

***Project Based Learning* (PBL)**

Project Based Learning is an innovative learning model or approach, which emphasizes contextual learning through complex activities (Cord, 2001). Project based learning focuses on the main (central) concepts and principles of a discipline, involves students in problem solving activities and other meaningful tasks, provides opportunities for students to work autonomously to construct their own learning, and culminates in producing student work products. valuable, and realistic (Okudan & Rzasa, 2006)

Project-Based Learning (PBL) is a learning method that uses projects/activities as a medium. Learners conduct exploration, assessment, interpretation, synthesis, and information to produce various forms of learning outcomes. Project Based Learning or project-based learning is a student-centered learning model to conduct an in-depth investigation of a topic. Students constructively carry out deepening learning with a research-based approach to problems and questions that are weighty, real, and relevant (Grant, 2002).

According to the Buck Institute for Education (BIE) (Hamdi & Hassen, 2021) "Project Based Learning is a learning model that involves students in problem solving activities and provides opportunities for students to work autonomously to construct their own learning, and ultimately produce valuable and realistic student work products.

Based on these opinions, Project Based Learning is a learning strategy developed based on constructivist learning that requires students to develop their own knowledge. Innovative

learning is student centered and places the teacher as a motivator and facilitator, where students are given the opportunity to work autonomously in constructing their learning.

Project Based Learning / PBL has characteristics that distinguish other models. These characteristics, among others:

1) Centrality: the project becomes the center of learning.
2) Driving questions: focused on questions or problems that lead students to find solutions with appropriate scientific concepts or principles.
3) Constructive Investigation: students build their knowledge by conducting independent investigations (teacher as facilitator).
4) Autonomy: requires student centered, students as problem solvers of the problems discussed.
5) Realism: student activities are focused on work that is similar to the actual situation. This activity integrates authentic tasks and produces a professional attitude (Thomas et al., 2003).

Objectives of Project Based Learning. Every learning model must have a purpose in its application. The objectives of project based learning, among others:

1. Improve students' ability to solve project problems
2. Acquire new knowledge and skills in learning
3. Make students more active in solving complex project problems with real product results
4. Develop and improve students' skills in managing materials or tools to complete tasks or projects
5. Increase student collaboration, especially in group PBL

Project Based Learning steps as developed by (Lucas, 2005) consist of:

1. Determination of Fundamental Questions (Start With the Essential Question)

   Learning begins with essential questions, namely questions that can give assignments to students in carrying out an activity. Assignment topics are relevant to the real world for students. and begins with an in-depth investigation.
2. Design a Plan for the Project

   Planning is done collaboratively between teachers and students. Thus students are expected to feel "own" over the project. Planning contains the rules of the game, the selection of activities that can support answering essential questions, by integrating various possible subjects, and knowing the tools and materials that can be accessed to help complete the project.
3. Create a Schedule. Teachers and students collaboratively develop a schedule of activities in completing projects. Activities at this stage include:
   1. create a timeline (time allocation) to complete the project,
   2. make a deadline for the completion of the project,
   3. Bringing students to plan new ways,
   4. guide students when they make ways that are not related to the project, and
   5. Ask students to make an explanation (reason) about choosing a method.
4. Monitor the Students and the Progress of the Project (Monitor the Students and the Progress of the Project)

   The teacher is responsible for monitoring student activities while completing the project. Monitoring is done by facilitating students in each process. In other words, the teacher acts as a mentor for student activities. In order to simplify the monitoring process, a rubric is created that can record all important activities.
5. Test Results (Assess the Outcome)

Assessment is carried out to assist teachers in measuring the achievement of standards, play a role in evaluating the progress of each student, provide feedback on the level of understanding that students have achieved, assist teachers in developing the next learning strategy.

6. Evaluate the Experience

At the end of the lesson, the teacher and students reflect on the activities and project results that have been carried out. The reflection process is carried out individually.

Project appraisal is an activity of assessing a task that must be completed within a certain period/time. The task is in the form of an investigation from planning, collecting data, organizing, processing and presenting data. Project assessment can be used to determine understanding, ability to apply, ability to investigate and the ability to clearly inform students on certain subjects (Kemendikbud, 2013).

Project Based Learning is a powerful driver for helping students learn to perform authentic and multidisciplinary tasks, use limited resources effectively and work with others. Experience in the field from both teachers and students that Project Based Learning is profitable and effective as learning besides that it has a high value in improving the quality of student learning. Anatta (Susanti & Sholeh, 2008) mentions several advantages of Project Based Learning, including the following:

1. Increase motivation, where students are diligent and work hard in achieving the project and feel that learning in the project is more fun than other curriculum components.
2. Improving problem-solving skills, from various sources that describe project-based learning environments make students more active and succeed in solving complex problems.
3. Increasing collaboration, the importance of group work in projects requires students to develop and practice communication skills. New and constructivist cognitive theories assert that learning is a social phenomenon, and that students will learn more in a collaborative environment.
4. Improving resource management skills, if implemented properly, students will learn and practice in organizing projects, making time allocations and other resources such as equipment to complete assignments.

(Susanti & Sholeh, 2008) based on experience found in the field Project Based Learning has several shortcomings including:

1. Class conditions are a bit difficult to control and it is easy to become noisy during project implementation because of the freedom for students so that it provides opportunities for noise and for this reason, teacher skills are needed in good classroom control and management.
2. Even though you have set sufficient time allocation, it still requires more time to achieve maximum results.

Student Learning Outcomes

(Usman, 2012), learning is a change in behavior in individuals due to the interaction between one individual and another and between the individual and the environment.

(Subrata, 1995) defines learning as "(1) leading to change, (2) that the change is essentially the acquisition of new skills, (3) that the change occurs because of a deliberate effort". (Subrata, 1995).

Learning outcomes are abilities obtained by individuals after the learning process takes place, which can provide behavioral changes in both knowledge, understanding, attitudes and skills of students so that they become better than before. (Purwanto, 2019)

(Mardianto, 2019) provides conclusions about the meaning of learning:

1. Learning is an effort, which means an act that is carried out seriously, systematically, by utilizing all the potential possessed, both physically and mentally
2. Learning aims to make changes in oneself, including changes in behavior that are expected to be positive and forward.
3. Learning also aims to change attitudes, from negative to positive attitudes, from disrespect to respect and so on.
4. Learning also aims to change habits from bad habits to good habits. These bad habits are changed to be a provision for a person's life so that he can distinguish which ones are considered good in society to be avoided and which ones must be maintained.
5. Learning aims to change knowledge about various fields of science, for example, do not know how to read to know to read, can not write so can write. Can't count to know how to count and so on.
6. Learning can make changes in terms of skills, for example skills in the field of sports, arts, engineering and so on.

From the several theories above regarding the understanding of learning outcomes, the learning outcomes referred to in this study are learning outcomes (changes in behavior: cognitive, affective and psychomotor) after completing the learning process using information search learning strategies and recitation methods as evidenced by the evaluation results. in the form of value. Learning outcomes are abilities obtained by individuals after the learning process takes place, which can provide behavioral changes in both knowledge, understanding, attitudes and skills of students so that they become better than before.

Definition of Science / Natural Sciences (IPA)

Natural Sciences (IPA) in the content of the 2013 Curriculum is a subject that has an important role in developing all aspects of the student's ability level in the learning process, this is because science is part of the subjects developed based on the achievement of three aspects, namely knowledge, attitude and skills, so that with the development process for these three aspects, science has a very important role, especially in developing students' scientific abilities, attitudes and skills. The study is in accordance with the regulation of the Minister of Education and Culture Number 57 of 2014 Article 5 Paragraph 2 (2014: 3) regarding the basic concepts of science subjects, namely the general subjects of Group A as referred to in paragraph (1) letter a, which is a curricular program that aims to develop competence attitudes, knowledge competencies, and competency skills of students as the basis and strengthening abilities in the life of society, nation and state.

Based on this opinion, it can be taken a form of understanding that science subjects are subjects that are included in the group of subjects that aim to develop attitudes, knowledge and skills competencies, these three aspects can be developed through a science learning process that has scientific and logical characteristics through In the process of observation, this is again reinforced by the opinion of (Sujana & Rachmatin, 2019) explaining that natural science or (science) is the result of human activities in the form of knowledge, ideas and concepts that are organized logically and systematically about the natural surroundings, which are obtained from experience through a series of scientific processes such as: observation, investigation, formulation of hypotheses followed by testing of ideas.

The purpose of learning science at the elementary school level has a role in providing confidence and faith in God Almighty in all forms of His power through the universe and its contents and also the events that occur in it, apart from that science also has the aim of developing knowledge about concepts -the concept of science learning materials contained in the learning materials, science was also developed to develop process skills through the

process of investigating events and subjects in the natural surroundings, thus having an impact on the development of an attitude of love for nature and its contents, this is reinforced by studies on 2006 curriculum, as follows:

a. Gaining confidence in the greatness of God Almighty based on the existence, beauty and orderliness of His creation.
b. Develop knowledge and understanding of science concepts that are useful and can be applied in everyday life.
c. Develop curiosity, positive attitude and awareness about the interplay of relationships between science, environment, technology and society.
d. Develop process skills to investigate the environment, solve problems and make decisions.
e. Increase awareness to participate in maintaining, preserving and preserving the natural environment.
f. Increase awareness to appreciate nature and all its regularities as one of God's creations.
g. Acquire knowledge, concepts and science skills as a basis for continuing to SMP/MTs.

Referring to this opinion, it can be understood that the purpose of learning science in elementary schools is to provide knowledge about the concept of science material, improve scientific attitudes, develop process skills through observation and discovery concepts, and provide opportunities for students to carry out an active and creative learning process. with direct experience of understanding the learning material.

The scope of science learning in elementary schools in the 2013 curriculum is adjusted to the level of student needs and improvement of learning outcomes that refer to spiritual aspects, attitudes, knowledge and skills. The scope of science subjects at the elementary level based on the decision of the Minister of Education and Culture (2014: 232) is as follows. The scope of elementary science subject matter includes the body and the five senses, plants and animals, the nature and form of surrounding objects, the universe and its appearance, the external form of the animal and plant bodies, the life cycle of living things, plant reproduction, the shape of objects, styles and motion, Forms and sources of energy and alternative energy, Appearance of the earth and its changes, Environment, the universe, and natural resources, Climate and weather, Skeletons and organs of human and animal bodies, Food, food chain, and ecosystem balance, Reproduction of living things, Adaptation of living things to the environment, Health and the human respiratory system, Changes and properties of objects, Conduction of heat, electricity and magnetism, Solar system, mixtures and solutions.

Based on the explanation of the scope of science learning in elementary school, it can be identified broadly that the scope of science learning in elementary school consists of the concept of the universe, events that occur in the universe, biological concepts, physics concepts, and chemical concepts. developed conceptually and simply. Some of these scopes are part of the basic presentation of science learning materials developed in elementary schools

METHOD RESEARCH

This research was conducted at SDN Utan Kayu Selatan 01. The location was chosen because the author teaches at SDN Utan Kayu Selatan 01 Class VI which is located on Jl. Pandan Raya RT.008 W.012 Mataraman District, East Jakarta Administration City. This research was conducted from August to October 2021 in semester 1 with 30 students consisting of 18 male students and 12 female students. In the subjects of Science / Natural Sciences KD 3.4 and 4.2 in the 2021/2022 academic year.

The research method used is classroom action research using two cycles. The data collection procedure is carried out based on the form of data to be obtained. To find out the students' abilities, a test is held at the end of each cycle. In the first cycle, the materials tested were series and parallel circuits in the form of projects and essays. In cycle II, the material tested was making a mixed series in the form of projects and essays.

To obtain accurate data, the teacher collaborates with colleagues to make observations during the learning process. Furthermore, the results of the observations are discussed together. The results of the discussion will be used as a guideline to determine reflection in taking further actions. This action is given in two cycles so that conclusions can be drawn in accordance with the research focus. Data collection techniques and tools were carried out through student observations and test results. While the technical analysis of the data is to pay attention to the type of data collected, there are two techniques used in this study, namely quantitative analysis and qualitative analysis. Quantitative analysis is used on test results while qualitative analysis uses data from observations of students, or other things that appear during this research. Likewise, activities and collaboration with groups in learning are also aimed at emerging indicators. Then from the results of field notes that are equipped with the results of observations, and student interviews, peer analysis is carried out, then interpreted based on literature review and teacher experience.

The criteria for completeness of accounting learning are 75 with ranges and descriptions of values, in table 1.

Table 1
Value Description

Value Range	Letter	Descriptive
90 – 100	A	Very Good
75 – 89	B	Good
50 – 74	C	Enough
30 – 49	D	Less
30 – 49	E	Less than once

RESULT AND DISCUSSION

In Cycle I, the action in Cycle I was meeting I. The material presented was an explanation of series circuits and parallel circuits. At the second meeting, the material presented was making a series circuit and a parallel circuit. To measure students' understanding of the material presented, projects and essays are given. Students in groups do the task during class hours. At the 3rd meeting students presented the project represented by only 2 groups and in the last 45 minutes a test was given to measure the success of the first cycle of learning. The learning outcomes obtained in the first cycle of 30 students who got an A score of 17% (5 students), got a B value as many as 53% (16 students), and getting a C score of 30% (9 students), getting a D score of 0% and getting an E score of 0%. This achievement has not met the learning mastery target, namely the value of A = 25%, B = 75%, C, D and E = 0%. Based on these results, it is necessary to continue in cycle II. In Cycle II, the action in Cycle II is the implementation of learning in Cycle II, starting with making action plans. The material taught is a mixed circuit. Cycle II was held in 3 meetings. The first meeting delivered mixed circuit material. The 2nd meeting delivered material on making a mixed circuit. At the second meeting, students were given a project in groups to make a mixed circuit. The purpose of giving assignments is to test students' abilities to the material presented through field data. The project is to make a written report that is to produce a mixed series report. At the third meeting, the project percentage was carried out for 2 groups

selected from the group that had not appeared in the first cycle. In the last 45 minutes, a test was conducted to measure the mastery of learning in the second cycle and circulated a student learning motivation questionnaire. Based on the results of this learning in the second cycle, student learning outcomes in the second cycle obtained the value of A increased to 33% (10 children). This result has exceeded the target of 25%. The B value is 63%, this result is above 75% of the achievement target. The acquisition of the value of A has not reached the target of learning achievement / mastery, the addition obtained for the value of B has not met the target.

However, in general, the application of projects for science/science subjects can improve student learning outcomes. Student learning outcomes are presented in table 2.

Tabel 2
Perolehan Nilai Siswa Siklus I dan II

Pra Siklus		Siklus I		Siklus II	Deskriptif	Ketuntasan
5	20%	5	17%	10	Sangat Baik	25%
12	40%	16	53%	20	Baik	75%
9	30%	9	30%	0	Cukup	0
4	13	0	0%	0	Kurang	0
0	0%	0	0%	0	Sangat Kurang	0
30	100%	30	100%	30		

The use of the Project Based Learning learning model is an innovative learning model or approach, which emphasizes contextual learning through complex activities. So that in learning Science/IPA students become the center of learning.

The results of the study revealed that science/science learning outcomes had increased. Student learning outcomes in the application of the Project Based Learning/PBL learning model showed an increase. Student learning outcomes after the implementation of the Project Based Learning / PBL learning model increases, so that it can change the learning atmosphere towards being creative, active and independent

In implementing the Project Based Learning / PBL learning model, students are required to be more independent in planning how to carry out the project that is their task. The project approach gives students complete freedom to do how to complete the project. Projects can be done by students if they are able to work together, communicate, solve problems, and solve problems at hand. So the use of projects in learning in addition to increasing knowledge and skill competencies can also motivate students. The increase in the percentage of students' motivation to follow the project-based model learning process is presented in table 3.

Tabel 3
Motivasi Belajar Siswa

Sub Indikator	Siklus 1		Siklus II		Peningkatan
	%	Kriteria	%	Kriteria	
1. Mendengar penjelasan guru	61%	Baik	92%	Sangat Tinggi	31%
2. Merespon pertanyaan	50%	Kurang	78%	Tinggi	28%

guru					
3. Mengerjakan Tugas	69%	Baik	89%	Sangat Tinggi	20%
4. Bertanya pada Teman	47%	Kurang	83%	Sangat Tinggi	36%
5. Merespon Pertanyaan Teman	25%	Kurang	61%	Sangat Tinggi	36%
Rata-rata	51%	Kurang	81%	Sangat Tinggi	30%

CONCLUSION

Based on the results of the research and discussion, the conclusion of this study is that the application of the Project Based Learning/PBL learning model can improve science/science learning outcomes in series, parallel and mixed circuits. The improvement in learning outcomes includes: making parallel, series and mixed circuit work reports. The results also showed an increase in students' learning motivation by 51% in Cycle-I to 81% in Cycle-II. Increased motivation includes: listening to explanations, responding to questions, doing assignments, asking questions, responding to questions. The conclusion of this study is that the application of the Project Based Learning/PBL learning model can increase students' motivation and learning outcomes in Science/Science. The suggestions in this research are expected that teachers can consider the application of learning models that are tailored to the needs of the material being studied, one example is the application of the Project Based Learning / PBL learning model to be able to create creative learning. Teachers also need to deepen their mastery of the application of learning models that are relatively new and develop according to the demands of the times and needs, so that learning is always active. And it is also necessary to socialize to teachers about learning models that can be applied in learning or even create their own innovative and creative learning models.

REFERENCES

Cord, O. (2001). *Genetic fuzzy systems: evolutionary tuning and learning of fuzzy knowledge bases* (Vol. 19). World Scientific.

Grant, M. M. (2002). Getting a grip on project-based learning: Theory, cases and recommendations. *Meridian: A Middle School Computer Technologies Journal*, *5*(1), 83.

Hamdi, K., & Hassen, G. (2021). Economic policy uncertainty effect on credit risk, lending decisions and banking performance: evidence from Tunisian listed banks. *Journal of Economic and Administrative Sciences*.

Kemendikbud, R. I. (2013). *Buku Pendidikan Anti-Korupsi Untuk Perguruan Tinggi*. Kemendikbud.

Lucas, G. (2005). Instructional Module Project Based Learning. *Educational Foundation*.

Mardianto, M. (2019). *Pemanfaatan Lingkungan sebagai Media dan Sumber Belajar*.

Okudan, G. E., & Rzasa, S. E. (2006). A project-based approach to entrepreneurial leadership education. *Technovation*, *26*(2), 195–210.

Purwanto, P. (2019). Gambar Karya Anak-Anak Pegunungan: Studi Kasus di SDN 2 Lencoh, Kecamatan Selo, Kabupaten Boyolali. *Imajinasi: Jurnal Seni*, *13*(2), 27–34.

Samatowa, U. (2006). *Bagaimana membelajarkan IPA di sekolah dasar*. PT Pustaka Indonesia Press.

Subrata, S. S. (1995). Psikologi Pendidikan. *Jakarta: Raja Grafindo Persada*.

Suci, R. S. (2018). *Mind mapping based in material development to increasing creative thinking skills of students at 3rd grade SDN Gadang Malang*. Universitas Islam Negeri Maulana Malik Ibrahim.

Sujana, A., & Rachmatin, D. (2019). Literasi digital abad 21 bagi mahasiswa PGSD: apa, mengapa, dan bagaimana. *Current Research in Education: Conference Series Journal*, *1*(1), 3–13.

Susanti, E., & Sholeh, M. (2008). Rancang Bangun Aplikasi E-Learning. *Jurnal Teknologi*, *1*(1), 53–57.

Thomas, J. W., Touchman, J. W., Blakesley, R. W., Bouffard, G. G., Beckstrom-Sternberg, S. M., Margulies, E. H., Blanchette, M., Siepel, A. C., Thomas, P. J., & McDowell, J. C. (2003). Comparative analyses of multi-species sequences from targeted genomic regions. *Nature*, *424*(6950), 788–793.

Usman, U. (2012). Peranan Model Pembelajaran Berbasis Masalah melalui Pendekatan Inkuiri dalam Pencapaian Penguasaan Konsep Fisika Mahasiswa Tingkat Pertama Program Studi Pendidikan Fisika. *Jurnal Sains Dan Pendidikan Fisika*, *8*(3).