IMPLEMENTATION OF PROJECT BASED LEARNING TO IMPROVE STUDENTS' UNDERSTANDING ON ENERGY FORMS TOPIC IN 4TH GRADE SDN KERTOSARI 02

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ABSTRACT

The learning process becomes less effective when the teacher just delivers the material conventionally or by telling method. Students tend to be passive because they uninvolved in the learning process directly and lack of understanding the material. Thus, a learning model is needed to improving students' understanding. One of the learning model applied is project-based learning. The aims of the study is determine the enhancement students' understanding in material of "Forms of Energy" at SDN Kertosari 02 through project based learning models. This research is classroom action research and consists of two cycles. The subjects of this study were fourth grade students of SDN Kertosari 02 which consists of 11 students. The data collection techniques used were observation, interviews and tests. In addition, the researcher also used qualitative and quantitative data analysis techniques. Qualitative data analysis obtained from observation results and quantitative data from the results of the test. Based on the results of data analysis in pre-cycle activities, the percentage of learning completeness was only 27.27% with only 3 students who complete while 8 students incompleteness. After applying the project-based learning model, there was an enhancement in cycle I, the percentage of learning completeness became 54.54%. there were 6 students who completed the test while 5 students incompleteness. Furthermore, there was a significant enhancement in cycle 2 with a percentage of learning completeness of 90.90%. There were 10 students who completed the test and only 1 students incompeteness. Actually, it showed that the project-based learning model could improve the understanding of fourth grade students on the material "Forms of Energy".

Keywords: Project Based Learning; Understanding; Forms of Energy

ABSTRAK

Proses pembelajaran menjadi kurang efektif apabila guru hanya menyampaikan materi secara konvensional atau metode ceramah. Peserta didik cenderung pasif karena tidak terlibat langsung dalam proses pembelajaran sehingga mereka kurang memahami materi yang diajarkan. Maka diperlukan model pembelajaran yang dapat meningkatkan pemahaman peserta didik. Salah satu model pembelajaran yang diterapkan yaitu project based learning. Penelitian ini bertujuan untuk mengetahui peningkatan pemahaman peserta didik terhadap materi "Bentuk Energi" di SDN Kertosari 02 melalui project based learning. Penelitian ini adalah penelitian tindakan kelas dan terdiri dari dua siklus. Subjek penelitian ini adalah peserta didik kelas IV SDN Kertosari 02 yang berjumlah 11 peserta didik. Teknik pengumpulan data yang digunakan adalah observasi dan tes. Selain itu, peneliti juga menggunakan teknik analisis data kualitatif dan kuantitatif. Analisis data kualitatif berasal dari hasil observasi dan data kuantitatif dari hasil tes dengan

menggunakan rumus statistik sederhana. Berdasarkan hasil dari analisis data pada kegiatan pra-siklus persentase ketuntasan belajar hanya 27,27% dengan jumlah peserta didik yang tuntas hanya 3 sedangkan yang belum tuntas sebanyak 8 peserta didik. Setelah diterapkan model pembelajaran project based learning, terdapat peningkatan pada siklus I, persentase ketuntasan belajar menjadi 54.54%. Sebanyak 6 peserta didik telah tuntas dan 5 peserta didik belum tuntas. Selanjutnya terjadi peningkatan yang signifikan pada siklus 2 dengan persentase ketuntasan belajar 90.90%. Sebanyak 10 peserta didik telah tuntas sedangkan 1 peserta didik belum tuntas. Dari hasil analisis menunjukan bahwa model pembelajaran project based learning dapat meningkatkan pemahaman peserta didik kelas IV pada materi "Bentuk Energi".

Kata Kunci: Project Based Learning; Pemahaman; Bentuk Energi

A. Introduction

In Indonesia, a new curriculum has been implemented, namely the independent curriculum. In the content of the independent curriculum, there are subject namely IPAS. IPAS are merged into Natural and Social Sciences. IPAS or Natural and Social Sciences is one of the elementary school subjects that contains science and social learning. The scope of IPAS is living beings and life processes, objects, matter, their properties and uses, energy and changes, as well as the earth and the universe (Suhelayanti et al., 2023).

The scope of energy material and its changes is contained in class IV material chapter I. This material discusses the source, form of energy and the process of changing the form of energy in daily life. Based on the results of observation, the researcher found a problem of lacking students' understanding on "Forms of Energy" material. The purpose of learning science and technology is to increase students' understanding about the world and the environment in daily life. Thus, a teacher should be a role of facilitator who provides facilities that support the enhance of students' learning ability.

Learning IPAS could help students to foster a sense of curiosity about phenomena in surrounding of environment. IPAS also emphasizes students to develop knowledge through practice and research directly about the object or material. This statement can be used by students to find solutions to a problem presented (Standar et al., 2022). In addition, it could help the teachers to achieve learning goals. The process of learning science in elementary school, a teacher could use the learning model to achieve goals.

Based on the observation, the reseacher, choose SDN Kertosari 02 Madiun as study. In there, teachers did

not implemented an interesting and varied learning models. During the learning process, teachers just applied conventional learning or telling method. Actually, this method unappropriated because students uninvolved directly in the learning process. Students tend to be passive and the learning process will be ineffective. This also causes the learning outcomes of students was low and under the standard of the minimum criteria.

One of the efforts to overcome these problems is applied a project-based learning model. The learning model is a framework that provides an overview of learning achievements to help students learn in achieving certain goals systematically (Simeru et al., 2023). Project-based learning is very relevant to IPAS subject. (Suhelayanti et al., 2023) Project-based learning could integrate science and social concepts through project development that involves direct observation. Certainly, it makes easier for students to understanding the related topics.

Project-based learning is a learning model that involves real-life activities and uses projects as the core of learning (Suhelayanti et al., 2023). The project-based learning model is very effective in improving student competence holistically, both in terms of attitudes, knowledge and skills. It was because the project-based learning learning model used a contextual approach that involves real activities in the learning process.

These are previous research that related to this study. Based on the results of research from Ineu Saddiyah and Asep Samsudin, it was stated that the project-based learning model could improve the ability to understanding the concept of energy changes material in 4th grade MI Al-Muhajirin (Sadiyyah & Samsudin, 2023). Other research that conducted by Erna Yuniasih, et al. also obtained that project-based learning model can improve science learning process skills and outcomes in elementary schools (Yuniasih et al., 2022).The previous research is proven that project-based learning model improving enhancement of material comprehensively. Based on the background, the researcher interested in conducting research with the title " Implementation of Project Based Learning To Improve Students' Understanding on Energy Forms Topic in 4th Grade SDN Kertosari 02".

B. Research Methods

This research was classroom action research that used project based learning models. Suharsimi stated that classroom action research comes from three words, namely research, action and class. Research is an activity of observing objects, using certain methodological rules to obtain data or information that is useful to improve the quality of something that is of interest and importance to researchers. Action is an activity that is deliberately carried out with a specific purpose, in the form of a series of activity cycles and the class is a group of students who in the same period of time receive the same lesson from the same person (Hikmawati, 2020).

According to Dick, action research is a flexible process which allows action to change, enhancement, understanding and knowledge) to be achieved at the same time (Rasyid, 2022). The researcher conclude that classroom action research is activity to otain the data or information in the class to enhance quality of learning process.

Project-based learning is a learning model that emphasizes giving tasks, especially in the form of projects that can guide students to experience the inquiry process (Hamidah et al., 2020). The implementation of project-based learning is required a syntax. Syntax is a sequence of phases or steps in the learning process (Dahri, 2022)The project-based learning model has learning stages including determining essential questions, planning projects and problem-solving strategies, determining project schedules, implementing and monitoring project progress, demonstrating projects and evaluating projects (Dahri, 2022).

The first stage is to provide challenging questions. At this stage the teacher makes a driving question as an assignment to students that is related directly to everyday life. Students are provided with problem descriptions related to the material “Forms of Energy”. The second stage is project planning. Planning is conducted by teachers and learners to decide together. Planning contains rules, selection of supporting activities, information related to tools and materials used to complete the “Table Forms of Energy” project. The third stage is the development of the activity schedule. Teachers and students collaborated to arrange a schedule of project activities. The project schedule should be clear as the time required and

time management to complete the "Table Forms of Energy" project.

The next step is the teacher should supervise or monitor the project. At this stage, the teacher is responsible for monitoring learners' activities while working on the project. This monitoring aims to facilitate learners in every process of completing the project and provide direction to learners how to work in groups. Product evaluation is the fifth stage in project-based learning. This evaluation is conducted to assist teachers in measuring the achievement of standards, learner progress, feedback on the level of understanding that has been achieved, and to assist in developing further learning strategies. Product assessment is done when each group presents the product in front of other groups. The last stage is evaluation. At the end of the lesson, teachers and learners reflect on the project activities and results. At this stage, learners are asked to express the experience they have obtained while completing the project.

The subjects of this research were class IV students at SDN Kertosari 02. The total number of class IV students were 11 which consist of 4 male students and 7 female students. In conducting the research, the researcher collected the data by a technique. The researcher used observation and test to collecting the data. Margono argues that observation is systematic recording of a symptom that appears on the object of study (Rahmadi, 2011). In these techniques, the data is gathered through the observation of process, behaviors, events, interactions, processes directly to obtain an understanding of the concepts (Taherdoost, 2021).

Observation or direct observation is used by researchers to see responses and activities during the learning process using the project based learning method in the classroom. In this activity, researchers used observation sheets as material for collecting data

The test used in the research was in the form of matching questions adapted to the material "Forms of Energy". The data analysis techniques used in this research are qualitative and quantitative. In the qualitative data analysis technique, the researcher uses the results of observation sheets in the learning process, while the quantitative comes from the learning results shown by students in the first and second cycles.The percentage formula is used to determine the percentage of the result of students' learning in the class.

C.Results and Discussion

The study showed that learning with the project-based learning models has improved. It could be seen in the changes in learning outcomes in pre-cycle cycle I and cycle II. The results are displayed in the following table

Tabel 1

Student Learning Outcomes In Pre-Cycle

	Pre-Cycle		
No	Category	Number of Student	(%)
1.	Completed	3	27,27 %
2.	Incompleted	8	72,72 %

Based on the tables , it can be explained that in the pre-cycle, fourth grade students of SDN Kertosari 02 lacked understanding of the material which could affect their learning outcomes. It can be indicated that before the action, there were 8 students with a percentage of 72.72% whose learning outcomes incompleteness the Minimum Completeness Criteria (KKM) of 75. Meanwhile, the 3 students with a percentage of 27.27% achieved the Minimum Completeness Criteria (KKM)

Tabel 2

Student Learning Outcomes In 1st Cycle

	1st Cycle		
No	Category	Number of Student	(%)
1.	Completed	6	54,54 %
2.	Incompleted	5	45,45 %

In table 2, it can be explained that the results of cycle 1 increased after applying project-based learning. It can be indicated that there were 6 students with a percentage of 54.54% whose learning outcomes achieved the Minimum Completeness Criteria (KKM) of 75. While 5 students with a percentage of 45.45% incompleteness the minimum completeness criteria.

Although it has increased, the results have not reached the target set in this study. This is because the implementation of the project-based learning model was not optimal. Teachers did not use concrete media when teaching materials and did not create class agreement to make students more conducive during the learning process.

Thus, the second cycle of action was implemented with several improvements based on the weaknesses in the first of the cycle. These improvements are: (1) the teacher used of concrete media when delivered the learning material, (2) the teacher and students created an class agreement in the form of rules that must be obeyed during the learning

process, (3) the teacher and students made an agreement in the form of rules that must be followed during the learning process.

Tabel 3

Student Learning Outcomes 2nd Cycle

		2nd Cycle	
No	Category	Number of Student	(%)
1.	Completed	10	90,90 %
2.	Incompleted	1	9,09 %

In table 3, it can also be explained that the results of cycle 2 increased after applying project-based learning. It is showed that there were 10 students with a percentage of 90.90% whose learning outcomes achieved the Minimum Completeness Criteria (KKM). While only 1 student with a percentage of 9.09% incompleteness the minimum completeness criteria.

D. Conclusion

Based on the results of research with learning material on forms of energy using project-based learning models in class IV at SDN Kertosari 02, it can be concluded that there were improvements in each cycle. Based on learning outcomes in pre-cycle activities, the percentage of learning completeness is only 27.27% with only 3 students who completened while 8 students are incompleteness. After applying the project-based learning model, there was an increase in cycle I, the percentage of learning completeness became 54.54%. A total of 6 students were completed and 5 students incompleteness.

Although it has increased, the results have not yet reached the target set in this study because the use of the learning model is not optimal. Furthermore, there was a significant increase in cycle 2 with a percentage of learning completeness of 90.90%. A total of 10 learners were completed while 1 learner incompleteness. With the results in cycle 2, it can be said that there was an enhancement. Based on the results, the implementation of the project-based learning model in learning Energy Form material is very influential in improving student's understanding.

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