Implementation of The Project-Based Learning Model To Improve Learning Outcomes IPAS Kelas V SD Negeri Lahendong

Roos M.S. Tuerah[1*], Ivana Rorimpandey[2], Fonny Katili[3]

[1,2,3]Fakultas Ilmu Pendidikan dan Psikologi, Universitas Negeri Manado, Indonesia
Corresponding author:
Email: roostuerah@unima.ac.id

Abstract.
This study aims to improve the learning outcomes of Natural and Social Sciences (IPAS) on the material of Ecosystems and the relationship between living things. Through the Application of Project Based Learning Model to Improve the learning outcomes of Grade V Ipas SD Negeri Lahendong. The PjBL model was chosen because it can encourage students to be more active, creative, and directly involved in the learning process through contextual projects. This study uses a classroom action approach (PTK) which is implemented in two cycles, each consisting of planning, implementation, observation, and reflection. The subjects of the study were 12 students of grade V SD Negeri Lahendong. The technique of collecting test results data was taken with a formula using the percentage of classical learning completeness. The results of the study showed an increase in student learning outcomes from cycle I to cycle II. In cycle I, student learning outcomes reached an average value of 68%, after improvements were made in cycle II, student learning outcomes reached an average value of 80%. The average student score increased, and student involvement in learning activities also increased. Thus, it can be concluded that the application of the Project Based Learning model is effective in improving students' science learning outcomes on the material Ecosystems and the Relationships Between Living Things.
Keywords: *Project Based Learning, learning outcomes and science.*

I. INTRODUCTION

Education is a conscious and planned effort to create a learning atmosphere and learning process, so that students actively develop their potential so that they have spiritual religious strength, self-control, personality, intelligence, noble morals. This is in accordance with the goals of national education that have been formulated in Law Number 20 of 2003. To achieve these educational goals, it is necessary to improve the quality of human resources through educational institutions, therefore elementary school (SD) is a formal education as a foundation for the creation of knowledgeable Indonesian people. (Tuerah, RMS, & Mamahit, EA2023:723)

Education is a conscious and planned process designed to shape individuals into knowledgeable, well-rounded individuals capable of living independently and in society. Education is not merely the transfer of knowledge, but also the instilling of values, attitudes, morals, and skills necessary for life.

The Natural and Social Sciences (IPAS) subject in the Independent Curriculum integrates science and social studies, aiming to simultaneously develop students' scientific and social literacy. IPAS is designed to help students understand the natural and social phenomena around them through an interdisciplinary approach. IPAS learning is expected to develop students' abilities in observing, questioning, gathering information, associating, and communicating learning outcomes.

However, the reality on the ground shows that science learning still faces various obstacles. Based on the results of initial observations conducted in grade V, several problems were found in science learning, especially in Chapter 2 which discusses "Ecosystems and the relationships between living things." These problems include: low student learning outcomes with average scores below the Minimum Completion Criteria (KKM), lack of active student involvement in the learning process, learning that is still theoretical and less contextual, and minimal use of the surrounding environment as a learning resource.

Based on initial observations at Lahendong State Elementary School, data was obtained that most fifth grade students had not yet achieved the KKTP (75) in science learning, especially on the material on ecosystems and the relationship between living things. Thus, of the 12 students, only 41% achieved the KKTP and 8 students did not.

One solution that can be applied to overcome these problems is the implementation of the Project Based Learning (PJBL) model based on ecosystems and the relationships between living things. The Project Based Learning (PJBL) model has been proven effective in improving students' abilities, as stated in various studies. Larmer emphasized that in the modern era (including 2020), the Project Based Learning (PJBL) model

is very relevant because it prepares students with skills such as collaboration, communication, critical thinking, and creativity that are very much needed in the world of work and life. This condition indicates the need for innovation in the science and science learning model that can overcome these problems. The learning model needed is a model that can activate students, integrate science and social learning, utilize the environment as a learning resource, and develop 21st-century skills. One learning model that has these characteristics is Project Based Learning (PjBL).

The Project-Based Learning model is a process-centered, relatively time-bound, problem-focused, and meaningful learning unit that integrates concepts from a number of components, including knowledge, disciplines, and fields. In project-based learning, learning activities take place collaboratively in heterogeneous groups. Tuerah, RM, & Mamahit, EA (2023:725).

Project-Based Learning is an innovative, student-centered learning model that provides meaningful learning experiences through the implementation of real-life projects. According to the Buck Institute for Education, Project-Based Learning (PBL) is a systematic teaching method that engages students in the acquisition of complex knowledge and skills through a structured inquiry process involving authentic and complex questions and carefully designed tasks and products.

The PJBL model has key characteristics that align with the needs of science learning, namely: centering on challenging and meaningful questions or problems, engaging students in constructive investigations, producing authentic products or solutions, being collaborative, and giving students autonomy in managing their learning. These characteristics enable students to actively construct knowledge, develop higher-order thinking skills, and increase learning motivation.

Furthermore, the PJBL model aligns with Ausubel's principle of meaningful learning. Meaningful learning occurs when students can connect new information to their prior knowledge. Through contextualized and life-relevant projects, PjBL enables meaningful learning that can enhance knowledge retention and transfer.

The context of the Science learning in Chapter 2 on "ecosystems and the relationships between living things" is very appropriate for the characteristics of PjBL. The material on ecosystems and the relationships between living things, the interactions of living things, and environmental conservation efforts can be used as the basis for interesting and challenging projects. Students can conduct direct observations of ecosystems and the relationships between living things, identify problems in ecosystems and the relationships between living things, and design solutions that integrate science and social aspects.

The implementation of PJBL in science learning can also develop 21st-century skills, including critical thinking, creativity, collaboration, and communication (the 4Cs). Through project implementation, students will learn to think critically in analyzing problems, be creative in designing solutions, collaborate with peers in completing assignments, and communicate in presenting their work.

Furthermore, the PJBL model can increase student engagement in learning because it gives students autonomy and responsibility to manage their own learning. This can increase students' intrinsic motivation, which ultimately impacts learning outcomes. Students will also feel more challenged and motivated because they are working on a real and meaningful project.

Using the environment as a learning context in PJBL can also increase students' awareness of environmental and social issues around them. This aligns with the goal of science and natural sciences learning, which is to develop students' scientific and social literacy. Through project-based learning, students not only understand science and natural science concepts theoretically but also apply them in real-life contexts.

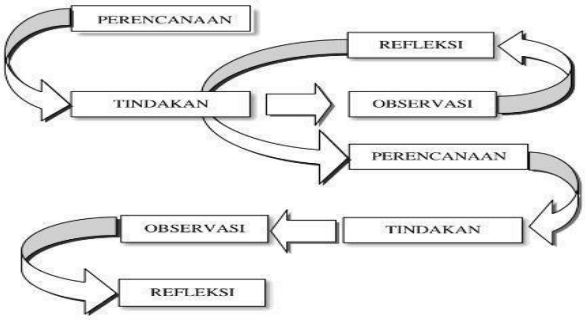
Based on the description, the researcher is interested in conducting research on the application of the Project Based Learning learning model to improve the learning outcomes of grade 5 Science and Science Chapter 2. This research is expected to provide solutions to existing Science and Science learning problems and contribute to the development of innovative and meaningful learning.

II. RESEARCH METHODS

The type of research used in this study is Classroom Action Research (CAR), with the goal of improving the quality of learning through specific actions within a cycle. According to Taggart, CAR is a form

of self-reflective research conducted by teachers in social situations to improve reasoning and the fairness of educational and social practices, as well as understanding of the practices and situations in which they occur.

The procedure in this study focuses on 4 (four) stages, namely the planning stage (plan), the action stage (action), the observation stage (observation), and the reflection stage (reflection). The activities above are called the problem-solving activity cycle. The Kemmis & Mc Taggart (2016) model is used in this study.



The research location is the place used to conduct research to obtain the desired data. This research took place in the fifth grade of Lahendong State Elementary School. The research time is the time the research took place, or when the research was conducted.

The subjects of this study were 12 fifth-grade students at Lahendong Public Elementary School, consisting of 7 boys and 5 girls. The objective of this study was to improve science learning outcomes through the use of the Project-Based Learning (PJBL) model in fifth-grade students at Lahendong Public Elementary School.

Data collection techniques include observation sheets. The observation sheets used are checklists during the learning process. Documentation is also used, including modules and student attendance lists.

The data obtained will be analyzed by calculating the percentage and average student learning outcomes by comparing the results of the learning and teaching activities through the research cycle, both cycle one and cycle two. Each student is said to have completed learning (individual completion) if the proportion of correct answers is 65% and one class is said to have completed learning (classical completion) if in one class there are 85% who have completed learning, Depdikbud (in Trianto, 2014: 241).

Data on student activity was observed using observation sheets. These observation sheets were aligned with the activity steps in the learning module. Student activity data was obtained from observation sheets completed by observers during the learning process. The percentage formula used to identify trends in the learning process according to Zainal Aqib et al. (2010:41) is as follows.

$$\text{Value} = \text{x } 100\% \frac{jumlah\ skor}{jumlah\ aspek\ yang\ diamati}$$

Data on teacher activity was observed using observation sheets. These observation sheets were aligned with the activity steps contained in the learning module. Data on teacher activity was obtained from observation sheets completed by observers during the learning process. The percentage formula used to identify trends in the learning process according to Zainal Aqib et al. (2010:41) is as follows:

$$\text{Value} = \text{x } 100\% \frac{jumlah\ skor}{jumlah\ aspek\ yang\ diamati}$$

If the data analysis conducted is ≤ 100%, it means there is a relationship with the provisions of project-based learning (PJBL), so it will be used as a consideration for revising the next learning device.

To calculate the completeness of learning outcomes using the classical learning completeness percentage, according to Zainal Aqib, et al (2010:41) as follows:

$$\text{Formula: P} = \text{x } 100\% \frac{Siswa\ Yang\ tuntas\ Belajar}{Jumlah\ Keseluruhan\ siswa}$$

III. RESEARCH RESULT

This research was conducted in class V of SD Negeri Lahendong which consists of 2 cycles. With a total of 12 students, consisting of 5 boys and 7 girls. This Classroom Action Research was carried out with 2 cycles where cycle I was carried out on May 6, 2026 and cycle II was carried out on May 20, 2026. With a

focus on the application of the Project Based Learning Model on the material of Ecosystems and Relationships between Living Things with the Sub Topic of ecosystems in rice fields.

During the learning process in the classroom, the researcher observed all ongoing teaching and learning activities. Based on the results of observations of student activities in cycle I, it was found that the indicator of providing basic questions was categorized as good, because students played an active role in responding to questions given at the beginning of learning. The indicator of designing project planning was categorized as less, because students were difficult to manage, and there were debates between groups. The indicator of compiling a project planning and completion schedule was categorized as sufficient, because some students were able to schedule project completion. The indicator of monitoring project progress was categorized as less, because students played more and disturbed other friends, besides that students were also classified as lacking in cooperation within their respective groups. At the stage of testing the results was categorized as less, because not all groups presented their project results in front of the class, the reason being that they preferred to play with their project results, rather than presenting their results. The indicator of evaluating was categorized as good, because students listened to the evaluation given by the teacher for future improvements.

Based on the above issues, this has an impact on the learning evaluation results in cycle I of the Natural and Social Sciences (IPAS) subject. The learning outcomes achieved by fifth-grade students at Lahendong State Elementary School can be seen in Table 4.1 below:

Table 4.1

Learning Outcomes of Class V Students in Cycle I

No	Name	Question Number					Amount	Information
		1	2	3	4	5		
		10	10	25	25	30		
1	AM	5	10	15	15	15	60	Not Completed
2	CA	5	10	15	20	25	75	Completed
3	CS	5	10	15	15	15	60	Not Completed
4	CS	5	5	15	15	25	65	Not Completed
5	FL	5	10	15	20	25	75	Completed
6	JK	5	10	15	20	25	75	Completed
7	JL	5	5	15	15	20	60	Not Completed
8	KP	5	5	15	20	25	70	Not Completed
9	MA	5	5	15	20	25	70	Not Completed
10	PM	5	10	15	20	25	75	Completed
11	PP	5	10	15	20	25	75	Completed
12	TS	5	10	15	15	15	60	No Completed
Amount		**60**	**100**	**180**	**215**	**265**	**820**	5
Total Score		**120**	**120**	**300**	**300**	**360**	**1200**	**68.33%**

Percentage of student learning completion in cycle I

$$KB = \frac{T}{Tt} \times 100\%$$

$$KB = \frac{820}{1200} x100\% = 68.33\%$$

Description:

KB = Learning Completion

T = Amount Obtained by Students Tt = Total Score Amount

In calculating the learning completeness above, the researcher added up the scores obtained by students, divided by the total score and multiplied by 100%, so the percentage of student learning success analysis obtained in cycle I only reached 68.33% with the level of student success who completed (classical completeness) only 5 students out of 12 students who achieved a minimum score of 75 as stipulated in the criteria for achieving Learning Objectives (KKTP).

In this reflection stage, the researcher evaluated the activities in cycle I, and found several weaknesses

in the learning implementation system that have been shown in the previous section. Where it shows that students are still less focused and less active in working together with group members and there are still many students who play with friends during the implementation of the learning project. Based on the problems above, the researcher sought a joint solution to the problems found in the class by taking action, namely by developing learning media that will be used. In addition, students are emphasized to be more focused and actively work together in learning projects. The teacher motivates students to be active in learning by getting closer to students, building student motivation by monitoring students a lot in project work to provide motivation and guidance.

Although there has been improvement in several indicators related to student learning outcomes and process skills, in this cycle, students who have achieved learning completion have not yet achieved the specified indicators. Therefore, a subsequent cycle is needed, which is expected to further improve student learning outcomes and process skills and address any remaining deficiencies.

The implementation of learning in cycle II, the teacher emphasized learning outcomes. The teacher has also been able to carry out learning well so that students can follow the learning enthusiastically. Based on the results of observations of student activities in cycle II, it was found that the indicator of providing basic questions was categorized as very good, because students played an active role in responding to questions given at the beginning of learning. The indicator of designing project planning was categorized as good, because students could already be managed by the teacher. The indicator of compiling a project planning and completion schedule was categorized as very good, because almost all students could schedule project completion. The indicator of monitoring project progress was categorized as very good, because students were already focused on making projects assigned by the teacher and they were already able to work together in groups. At the testing stage, the results were categorized as good, because almost all groups presented their project results in front of the class. The indicator of evaluating was categorized as good, because students listened to the evaluation given by the teacher for future improvements.

From the statement above, it can be said that the improvements in Cycle 2 have experienced extraordinary improvements because it can be seen that student activity has increased, and their cooperation in groups is very good. This is influenced by the division of groups that has been arranged by the teacher, which can make students work together as a team and automatically this also has an impact on their learning outcomes because they understand more about the learning that is taking place in class.

Based on the improvements in the learning process in cycle II, this had a very significant impact on student learning outcomes. The learning outcomes achieved by fifth-grade students at Lahendong State Elementary School in cycle II can be seen in Table 4.2 below:

Table 4.2

Learning Outcomes of Class V Students in Cycle II

No	Name	Question Number					Amount	Information
		1	2	3	4	5		
		10	**10**	**25**	**25**	**30**		
1	AM	5	10	15	15	20	65	Not Completed
2	CA	5	5	20	25	25	80	Completed
3	CS	5	10	15	15	30	75	Completed
4	CS	5	5	15	25	30	80	Completed
5	FL	5	10	15	25	30	85	Completed
6	JK	5	10	25	25	30	95	Completed
7	JL	10	5	15	25	25	80	Completed
8	KP	5	10	15	20	25	75	Completed

9	MA	5	10	15	20	20	70	Not Completed
10	PM	5	5	25	25	25	85	Completed
11	PP	10	10	15	25	25	85	Completed
12	TS	5	10	15	20	25	75	Completed
Score		**70**	**100**	**205**	**265**	**310**	**950**	All
Total Score		**120**	**120**	**300**	**300**	**360**	**1,200**	**79.16%**

Presentation of student learning completion in cycle II

$$KB = \frac{T}{Tt} \times 100\%$$

$$KB = \frac{950}{1.200} \times 100\% = 79.16$$

Information :

KB = Learning Completion

T = Amount Earned by Tt Students Tt = Total Score Amount

In cycle II, it can be concluded that all, or 10 out of 12 students (79.16%) have achieved the target. This is due to the improvement in results from cycle I to cycle II, with student learning completion results in cycle II reaching 79.16%.

Based on the observation results and the results of the learning process of fifth grade students of Lahendong State Elementary School, there has been a significant increase. This is evidenced by the results obtained by students where all students have been said to have completed even though initially there was 1 student whose score did not reach the KKTP, but this was immediately followed up by the researcher through the provision of remedial and enrichment. The results of the remedial activities show positive developments where the student was finally able to achieve the KKTP standard score of 75, the value of the remedial results has also been included in the learning outcomes table as evidence that each student gets the opportunity to develop and achieve learning targets. Therefore, in general it can be concluded that the use of the Project Based Learning model in learning natural and social sciences (IPAS) has been implemented well. So by looking at the success of the process and learning outcomes that have been achieved by students in the implementation of cycle II, this research is considered sufficient to be carried out.

IV. DISCUSSION

This research was conducted with the aim of improving student learning outcomes in Natural and Social Sciences (IPAS) subjects in grade V of Lahendong Public Elementary School through the application of the Project Based Learning model. This research was motivated by the existence of problems in the learning process that is only centered on the teacher and tends to make students passive, less motivated, and have difficulty understanding abstract material concepts, especially in the topic of Ecosystems & relationships between living things. The project-based learning model was chosen because it is considered capable of providing meaningful learning experiences, increasing student involvement in the learning process, and developing 21st century skills, such as cooperation, communication, creativity, and problem solving. One of the innovative learning models that can be used is the Project-Based Learning learning model. This model emphasizes project-based learning that allows students to learn actively by conducting experiments and completing project-based assignments Manaroinsong, PM, Rindengan, ME, & Katili, F. (2026:48).

The implementation of the Project Based Learning model in this study was carried out through two cycles. Each cycle consisted of planning, action strategies, observation, and reflection. In cycle I, the implementation of this model still faced various challenges and did not achieve optimal results. Students showed varying levels of enthusiasm; some students were quite active, but most still had difficulty focusing, working together in groups, and completing project assignments responsibly. Evaluation results showed that out of 12 students, only 5 students (45.45%) achieved scores above the Learning Objective Achievement

Criteria (KKTP) of 75. This indicates that the majority of students had not yet successfully understood the learning material. Furthermore, the results of the implemented project also showed that students' collaborative skills, activeness, and creativity still needed to be improved. Many students were more interested in playing with the project results than presenting them to their friends. Observations also showed that group collaboration was not running effectively, and even debates occurred between students within the group. The problems found in cycle I became the basis for the researcher to conduct reflection and improvements in cycle II. Improvements were made by refining the learning strategy, namely by dividing students into smaller groups for more effective management and adding games during lessons before working on projects to gauge students' understanding of the material. Furthermore, teachers increased the intensity of monitoring and provided closer guidance to each group. Teachers also strived to build better communication with students to motivate them to be more active and responsible in the learning process.

After improvements were made, the implementation of Cycle II showed very significant improvements, both in terms of learning process and outcomes. In Cycle II, students appeared more enthusiastic and active in participating in learning activities. They appeared to better understand their roles and responsibilities in groups, and were more focused on completing projects. The teacher also succeeded in creating a more conducive learning atmosphere by building emotional closeness with students and giving recognition for their hard work. As a result, student learning outcomes improved sharply, with 10 out of 12 students (83.33%) achieving scores above the KKTP (Qualified Minimum Competency). The average class score increased from 68.33% in Cycle I to 79.16% in Cycle II. This improvement indicates that the PjBL model has a significant contribution in improving students' conceptual understanding. Students began to demonstrate critical and innovative thinking skills in designing simple projects and were able to explain the process of energy transformation in the experiments they conducted. Collaboration within groups also improved significantly, with students beginning to share tasks, discuss effectively, and help one another. Their active participation in presenting project results also demonstrated that students felt responsible for their work. The success of this project reflects that students not only experienced improvements in cognitive aspects, but also in affective and psychomotor aspects. The improvement in learning outcomes shows that the Project Based Learning model is very effective in improving the quality of science learning. Student interest in learning science subjects is a crucial aspect that needs to be considered as a basis for improving learning outcomes. Therefore, educators are required to design and present a conducive, adaptive, and structured learning ecosystem, so that students can optimize learning time more efficiently, productively, and oriented towards achieving maximum competencies. Science learning should not only be a means of transferring knowledge from teachers to students, but must also be able to connect students' real experiences with the concepts learned so that learning activities become more meaningful. Tarigan, RTB, Tuerah, RM, & Mandey, S. (2026: 903-904).

Aside from that,Science learning aims to equip students with knowledge and understanding that can be used to face life in the future. Science learning in elementary schools covers a variety of materials related to students' daily lives. Toar, FJ, Sumampow, ZF, & Katili, F. (2026:48)

This aligns with the views of Thomas (2000) and Moursund (1999), who stated that project-based learning can enhance conceptual understanding through meaningful, hands-on learning experiences, as well as develop social skills and teamwork. Project-based learning (PjBL) also provides students with opportunities for contextual learning, making it easier for them to connect the subject matter to everyday life. Thus, learning becomes not merely an abstract academic activity but a tangible, enjoyable, and memorable experience for students (Emira Hayatina Ramadhan & Hindun Hindun, 2023).

The above conditions also demonstrate the crucial role of teachers in the successful implementation of innovative learning models. Teachers serve not only as conveyors of information but also as facilitators, motivators, and guides who must be able to create a positive learning environment. Success in cycle II is inseparable from teachers' ability to understand student characteristics, manage the classroom, and guide students through the learning process and project work. Through active teacher involvement at every stage of learning, students feel cared for and encouraged to demonstrate their best performance.

Overall, this discussion underscores that the Project-Based Learning model is capable of improving

student learning outcomes and skills across the board. While the implementation of this model initially faced various challenges, it proved capable of addressing existing learning challenges, provided it was implemented with careful planning, intensive mentoring, and ongoing reflection. This success suggests that Project-Based Learning (PjBL) can be a relevant and applicable learning alternative for implementation in science and other subjects at the elementary school level. Learning that emphasizes thinking processes and real-world experiences, as offered by Project-Based Learning (PjBL), can serve as an important foundation for building students' character and competencies in the future.

V. CONCLUSION

Based on the results of research conducted in grade IV of SD Negeri Lahendong on the subject of Natural and Social Sciences (IPAS) using the Project Based Learning model, it can be concluded that this learning model can improve student learning outcomes optimally, this is evidenced by the results of research that shows an increase in student learning completeness from 68.33% in cycle I to 80.83% in cycle II. This increase indicates that the Project Based Learning model is effective in improving students' conceptual understanding and learning outcomes in the subject of IPAS, especially on the material of Ecosystems & relationships between living things. This model not only contributes to improving cognitive learning outcomes, but also to the development of students' affective and psychomotor aspects through active, collaborative, and meaningful learning activities.

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