



Increasing Student Learning Interest through *Project Based Learning* (PjBL) Learning Model Assisted by Material Props Build Class V Student Room SDN Kesambi in 3 Cirebon

Rena Refiana¹, Nurkholis², Ikariya Sugesti³, Venny Indriasari⁴

¹Muhammadiyah University Cirebon, Indonesia, email: renarefiana@gmail.com

²Muhammadiyah University Cirebon, Indonesia, email: nurkholis@umc.ac.id

³Muhammadiyah University Cirebon, Indonesia, email: ikariya.sugesti@umc.ac.id

⁴Muhammadiyah University Cirebon, Indonesia, email: vennyindriasari11@guru.sd.belajar.id

Abstract. The background of this research is the low interest of students in learning mathematics. Can using the PjBL model assisted by teaching aids increase students' interest in learning mathematics in class V SDN Kesambi Dalam 3? The purpose of this study was to find out the benefits of the visual aid-assisted Pjbl model in attracting student interest in learning to improve mathematics learning. The type of research used is classroom action research (CAR), which consists of cycle I and cycle II. Each cycle consists of planning, implementing actions, observing and reflecting. This research was conducted at SDN Kesambi Dalam 3 with research subjects in class V with a total of 24 students. Data collection techniques were carried out through observation sheets which were analyzed descriptively using percentage techniques and questionnaires were analyzed using a Likert scale scoring system. Based on the results of the research that has been done, it can be concluded through the following matters: (1) In the first cycle, it was found that the student's learning interest reached 49,6 % which indicated that the student's interest category was not good (2) In the second cycle, it was found that the student's interest in learning students experienced an increase, namely 73.3% (3) Analysis of student interest in learning showed that the category of student interest in the learning process was good. Thus learning mathematics through the Pjbl model with props can increase students' interest in learning in class V SDN Kesambi Dalam 3 Cirebon.

Keywords: Learning Interest, PjBL Model, Teaching Aids

INTRODUCTION

Various advances in human civilization to date have never been separated from the world of education. This is certainly reasonable because through education can be created Human Resources (HR) that are able to optimize the sharing of existing resources to be utilized in life. In the learning process at school, students are taught several subjects, one of which is mathematics. Mathematics is a field of science that has a very important position in the world of education. This is because mathematics is a basic science for the development of other disciplines.

But in reality, mathematics lessons are often considered difficult, not easy to understand, and boring. Sometimes students show a bored and uninspired mimic when math lessons take

place. This is thought to be due to various factors, including students not understanding basic concepts well, lack of students' ability to answer questions because of the many things that must be solved, from formulas to memorizing or interpreting in their mathematical language, and the way teachers deliver material that refers more to the achievement of the material than the success of students in mastering and understanding the material, And even because of the difficulty of mathematics lessons there are learners who are afraid of mathematics subjects.

The difficulty faced to understand mathematics is not used as a learning opportunity but a burden in learning. This causes learners to be reluctant to learn mathematics. Based on the results of initial observations made at SDN Kesambi Dalam 3, information was obtained from subject teachers that so far mathematics learning activities, especially VB classes, still use or apply conventional learning models. In its implementation, teachers use the lecture method more as the main method, where in conventional learning, the teacher is the facilitator, while the students are the listeners and recipients of information from the learning process carried out.

Low interest in learning and mathematics learning outcomes due to the learning model used by the teacher during classroom learning. Such a monotonous learning process makes students less active in the learning process, so that students feel bored, bored, and lazy to solve problems if not ordered by the teacher. When students are faced with a problem, students are also very difficult to associate the material taught with situations in the real world. In addition, students are afraid and embarrassed to ask or answer questions from their teachers because in them there has been a feeling of fear.

The learning model recommended by the Ministry of Education and Culture based on the 2013 curriculum is Project Based Learning (PjBL). The PJBL model has been proven to increase students' motivation to learn mathematics by 8%, namely 77% in cycle 1 and increased by 85% in cycle 2. Therefore, project-based learning is recommended to be applied in Mathematics learning. (Hapsari, 2019). PjBL has steps that teachers must take by explaining the project to be carried out, explaining the stages of making the project, determining the time of project work, supervising and monitoring student activities in completing the project, testing the results and evaluating the results of the project.

This PJBL learning process will provide experience for each group to collaborate, respect the opinions of their group members' ideas, and provide direction towards independence, competition and mutual respect. Departing from the core of the learning problems in the classroom of students and the findings of solutions that researchers believe can increase interest

in learning mathematics, the proposed title of this class action research (PTK) is entitled "Increasing Student Learning Interest through the *Project Based Learning* (Pjbl) Learning Model Assisted by Material Props for Building Class V Students of Sdn Kesambi Dalam 3 Cirebon".

METHOD

The setting in this study includes the place of research, the time of research and the cycle of classroom action research (PTK). The setting of the study can be explained as follows: This class action research was carried out at SDN Kesambi Dalam 3 for Mathematics subjects. The subjects in this study are grade V students for the 2022/2023 academic year with a total of 24 students, consisting of 10 male students and 14 female students. The study will be conducted from May 23 to May 25, 2023. The timing of this study, refers to the school's academic calendar, because classroom action research requires several cycles that require an effective teaching and learning process in the classroom.

1. Data Collection Tools and Techniques

1. Data Collection Tools

This research tool consists of several types, namely:

Questionnaire

Documentation

2. Data Collection Techniques

Data collection techniques in this study are questionnaires, documentation.

Questionnaire

To find out the attitude and peers about learning Mathematics through the PjBL model.

Documentation

The author documents in the form of observation sheets, photos and videos taken while learning is in progress.

3. Data Analysis

The data obtained from the observations were analyzed descriptively. Every learning activity carried out is material that determines the next action. In addition, all data is used to draw conclusions and actions taken. The data that was successfully concluded was then analyzed using descriptive analysis techniques using percentage techniques to see the trends that occurred in learner activities. By using the formula proposed by Hariadi in Ria Santosa (2009: 43) as

follows:

N = Number of children present.

4. Research Procedure

The procedure for implementing this research will be carried out in cycles, namely cycle I and cycle II. After completing cycle I, continue with cycle II.

Cycle 1

The first cycle in PTK consists of planning, implementation, observation and reflection as follows:

1. Planning
2. Acting
3. Observation
4. Reflecting

Cycle 2

Like the first cycle, the second cycle also consists of planning, acting, observation and reflecting.

1. Planning
2. Acting
3. Observation
4. Reflecting

DISCUSSION

After conducting the Classroom Action Research (PTK) procedure which starts from making proposals, making instrument sheets and applying the methods made, the researcher reports the results of PTK. Researchers have also carried out data collection techniques, then analyzed data with observer, tried to draw conclusions, determine corrective actions according to the results of the study and determine the next action in each cycle, so in this chapter the researcher will describe the results of research that has been achieved in implementing PTK.

Implementation of Cycle I

Planning Phase

Planning in the first cycle on May 23, 2023, researchers made a learning implementation plan as follows:

- Researchers conduct curriculum analysis to find out the basic competencies that will be delivered to students in learning Mathematics.
- Create a learning plan that refers to the actions applied in PTK, namely by learning through the Pjbl model.
- Create infrastructure that supports the learning process.
- Compile learning observation sheets.

Researchers make sheets of instruments.

Figure 1. Questionnaire Sheet Instrument

No	Pernyataan	Kategori Jawaban				
		SS	S	N	TS	STS
1	2	3	4	5	6	7
1	Pembelajaran bangun ruang menggunakan alat peraga dengan model <i>Project Based Learning</i> menumbuhkan minat saya dalam belajar matematika					
2	Menurut saya pembelajaran yang baru dilakukan itu menarik karena menggunakan Alat Peraga yang mudah untuk dipahami					
3	Saya tidak suka mencoba menyelesaikan soal matematika dengan beberapa cara yang berbeda					
4	Menurut saya pembelajaran matematika adalah pelajaran yang sulit dipahami.					
5	Jika saya tidak memahami soal-soal yang diberikan guru, saya akan berusaha untuk bisa memahaminya					
6	Menurut saya model Pjbl dalam pembelajaran Matematika membuat saya lebih terampil					
7	Dengan menggunakan model Pjbl di pelajaran matematika mempersulit saya memahami materinya					

8	Saya dapat mempresentasikan hasil diskusi dengan karya dari hasil pemahaman dengan lancar					
9	Dalam kegiatan berkelompok saya lebih senang berdiskusi tentang hal-hal lain yang tidak berhubungan dengan matematika.					
10	Dengan diadakannya Refleksi, pembelajaran akan semakin dipahami					
11	Saya merasa kecewa ketika guru tidak menggunakan alat peraga dalam pembelajaran Matematika.					
12	Guru menggunakan alat peraga matematika di kelas ketika mengajar pelajaran matematika					
13	Saya merasa bosan menggunakan alat peraga matematika					
14	Saya mempunyai kesempatan menggunakan alat peraga matematika di kelas					
15	Alat peraga matematika yang digunakan berhubungan dengan materi matematika yang saya pelajari					

Stages of execution of actions

The stage on the implementation of the action is carried out with the procedure that has been planned on May 23, 2023. At this meeting the number of students present was 20 people out of 24 people enrolled in class VB, two students who did not attend without information and two people were sick.

Introduction

In this cycle, the learning process takes place based on a predetermined learning implementation plan (RPP). In the implementation of Mathematics learning, the steps of learning activities or learning processes that will be carried out previously are gathering students to march, pray, absenteeism, stimulate students' initial knowledge of the material of building space, core activities and closing activities. The implementation of the introduction students listen to the teacher's explanation presented through the Canva application, then students are asked to analyze the various types of building space.

Figure 2. Learning Implementation



Core Activities

After the introduction then give an explanation of the core activities. In the core activity, students carry out learning activities with an explanation of building space and applying the Pjbl learning model, where students are asked to make works in the form of building space including building cubes, blocks, prisms, and pyramids.



Figure 3. Making a Space build from plasticine and straws

Students are divided into groups, namely into 5 groups to make various kinds of space from plasticine and straws

Concluding Activities

In the closing activity, students are collected and lined up, then the teacher evaluates the learning results that have been carried out and provides solutions about the material that has not been understood by students, then the closing prayer and finally the students are disbanded.

Observation stage

Observations are carried out through questionnaire sheets. The questionnaire sheet is used to find out students' opinions about learning that has been carried out using the Project Based Learning (PjBL) model assisted by teaching aids.

Calculation of the Likert scale variable variation menu:

Number of samples: 20 org

Number of statements: 15

- Respondents who answered strongly agreed (score 5) totaled 25 people
- Respondents who answered in the affirmative (score 4) totaled 18 people
- Respondents who answered neutral (score 3) totaled 77 people
- Respondents who answered disapproval (score 2) totaled 126 people
- Respondents who answered very unfavorable (score 1) amounted to 65 people

Formula: $T \times P_n$

T : Total number of respondents who voted

P_n : Likert score number selection

- Respondents who answered strongly agreed (score 5) = $25 \times 5 = 125$
- Respondents who answered affirmatively (score 4) = $18 \times 4 = 72$
- Respondents who answered neutral (score 3) = $77 \times 3 = 231$
- Respondents who answered disagreed (score 2) = $126 \times 2 = 252$
- Respondents who answered very unfavorable (score 1) = $65 \times 1 = 65$

All results summed, total score = 745

Interpretation of Calculation Scores

Y = highest score of likert x number of respondents x number of respondents

$$= 5 \times 20 \times 15$$

$$= 1500$$

X = lowest likert score x number of respondents

$$= 1 \times 20 \times 15$$

$$= 300$$

Interval Formula

$I = 100 / \text{number of scores}$ Then $= 100 / 5 = 20$ (the interval is the distance from the lowest 0% to the highest 100%)

Here are the criteria for interpretation of scores based on intervals

Figure 0% – 19,99% = Very (disagree/dissatisfied/bad/less once)

Number 20% – 39.99% = Disagree/Dissatisfied/Less good)

40% – 59.99% = Moderately satisfied/Simply agree/Neutral

Number 60% – 79.99% = (Agree/Good/Satisfied/Like)

Number 80% – 100% = Very (agree/Good/Satisfied/Like)

Final Settlement

Index Formula % = Total Score / Y x 100

$$= 745 / 1500 \times 100$$

$$= 49.6 \% \text{ (Neutral).}$$

Thus, the results for menu variations are in the Neutral category

During the learning process, the teacher assesses the process and observes student activities. The aspects observed during the learning process are students' interest when learning mathematics, namely enthusiastic in working on projects, daring to ask teachers, and being able to discuss and complete projects according to the tasks given.

Implementation of cycle II

Cycle II is an improvement action from the previous cycle but in this cycle there are differences in assignments, learning is expected to continue to increase. In this second cycle, the assignment given is more directed to the material for making space building nets.

Planning stage

The second cycle will be held on June 25, 2023 with 20 students and one among teacher.

The actions in cycle II are as follows:

- Create a learning implementation plan (RPP) developed based on the needs of writing reports used in research.
- Making instruments used in the PTK cycle.
- Prepare the media and teaching aids needed to help teaching so that the learning implementation process can run smoothly.
- Compile learning observation sheets.
- Improve the PjBL model assisted by teaching aids to be more effective in the learning implementation process.

Implementation stage

The implementation of the action is carried out with the procedure that has been planned on May 25, 2023. At this meeting, V B students were present equally, namely 20 students.

Introduction

In this cycle, the learning process takes place based on a predetermined learning implementation plan (RPP). In the implementation of Mathematics learning, the steps of learning activities or learning processes that will be carried out previously are gathering students to march, pray, absenteeism, stimulate students' initial knowledge of space building net material, core activities and closing activities. The preliminary implementation of students listened to the teacher's explanation presented through the Canva application, then students were asked to analyze the webs of building space.

Figure 4. Learning Implementation



Core Activities

After the introduction then give an explanation of the core activities. In the core activity, students carry out learning activities with an explanation of space building nets using teaching aids, namely students are asked to make works in the form of space building nets including building cubes, blocks, prisms, and pyramids.

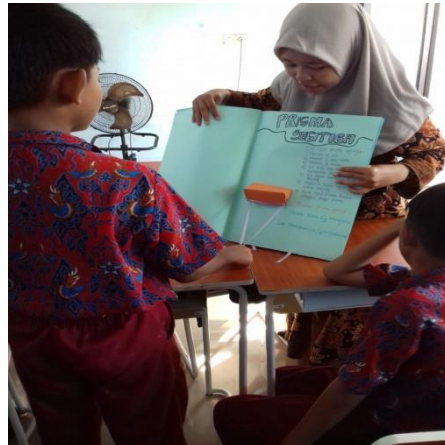


Figure 5. Use of Space Building Props

Props are made to make it easier for students to see directly the shape of the building space, see the characteristics of the building space, namely there are ribs, sides, corner points, and diagonal planes. Students are divided into groups of 5 groups to make space nets from origami paper and mattress thread.

Figure 6. Project Creation



Concluding Activities

In the closing activity, students are collected and lined up, then the teacher evaluates the learning results that have been implemented, provides reflection and provides solutions about material that has not been understood by students, then the closing prayer and finally the students are disbanded.

1. Observation stage

Observations are carried out through questionnaire sheets. The questionnaire sheet is used to find out students' opinions about learning that has been carried out using the Project Based Learning (PjBL) model assisted by teaching aids.

Calculation of the Likert scale variable variation menu:

Number of samples : 20 org

Number of statements : 15

- Respondents who answered strongly agreed (score 5) totaled 86 people
- Respondents who answered in the affirmative (score 4) totaled 96 people
- Respondents who answered neutral (score 3) amounted to 62 people
- Respondents who answered disapproval (score 2) totaled 31 people
- Respondents who answered very unfavorable (score 1) amounted to 38 people

Formula: $T \times P_n$

T : Total number of respondents who voted

P_n : Likert score number selection

Respondents who answered strongly agreed (score 5) = $86 \times 5 = 430$

- Respondents who answered affirmatively (score 4) = $96 \times 4 = 384$
- Respondents who answered neutral (score 3) = $62 \times 3 = 186$
- Respondents who answered disagreed (score 2) = $31 \times 2 = 62$
- Respondents who answered very unfavorable (score 1) = $38 \times 1 = 38$

All results are summed, total score = 1,100

Interpretation of Calculation Scores

Y = highest score of likert x number of respondents x number of respondents

$$= 5 \times 20 \times 15$$

$$= 1500$$

X = lowest likert score x number of respondents

$$= 1 \times 20 \times 15$$

$$= 300$$

Interval Formula

$I = 100 / \text{number of scores}$ Then $= 100 / 5 = 20$ (the interval is the distance from the lowest 0%

up to a high of 100%)

Here are the criteria for interpretation of scores based on intervals

Figure 0% – 19,99% = Very (disagree/dissatisfied/bad/less once)

Number 20% – 39,99% = Disagree/Dissatisfied/Less good)

40% – 59,99% = Moderately satisfied/Simply agree/Neutral

Number 60% – 79,99% = (Agree/Good/Satisfied/Like)

Number 80% – 100% = Very (agree/Good/Satisfied/Like)

Final Settlement

$$\begin{aligned}\text{Index Formula \%} &= \text{Total Score} / Y \times 100 \\ &= 1,100 / 1500 \times 100 \\ &= 73.3 \% \text{ (Good)}.\end{aligned}$$

Thus, the results for menu variations are in the Good category.

The data from the observations above showed that students experienced an increase in interest in learning the percentage was 49.6% to 73.3%. Based on the results of observations on the process of Mathematics learning activities, an average of 73.3% was obtained in the second cycle of meeting two.

After the students complete the lesson, the teacher distributes questionnaires about the learning that has been carried out in cycles I and II. The results of measuring student learning interest are processed using the Likert scale scoring with the intention that teachers know teacher performance, especially student learning interest in Mathematics learning, questionnaire items and data analysis are the same as the previous cycle.

Based on the table above, the analysis of student learning interest data on mathematics learning obtained an average of 73.3% (the number of scores of all students divided by the number of students in the class) so that it can be determined that student learning interest in class VB in cycle II is categorized (Good) compared to cycle I.

Reflection Stage

Based on the data from observations on the implementation of the learning process in this cycle, there are the following findings:

1. There was an increase in student interest in learning, namely in mathematics lessons from 20 students
2. Analysis of student learning interest obtained an average of 73.3% with the category of student learning interest in class V B is good.

Based on the data from observations and data analysis of student learning interest in learning activities, it can be concluded that, learning Mathematics through the PjBL model assisted by teaching aids in an effort to increase student interest in learning in grade V SDN Kesambi Dalam is said to be successful.

CONCLUSION

Based on the analysis of the data from this class action research, it is concluded that the application of the teaching aid-assisted PjBL model can increase student learning interest in the Mathematics learning process in class V in the even semester of the 2022/2023 academic year. The increase in student interest in learning Mathematics can be seen from the following:

1. The learning process with the playing method received a positive response from students because it was considered very interesting, fun, made students more active and aroused students' desire to learn mathematics.
2. From the results of filling out the questionnaire sheet carried out, it can be seen that there is an increase in the learning process, in cycle one an average of 49.6% is obtained and cycle two is obtained an average of 73.3%. This shows that there is an increase of 23.7% from cycle I to cycle II.
3. Analysis of student learning interest shows that the category of student learning interest in class V is Good.

Based on the description above, it can be concluded that students' interest in learning is high and the application of the Project Based Learning (PjBL) model with rocky teaching aids has succeeded in increasing student interest in the Mathematics learning process in grade V SDN Kesambi Dalam 3. It is recommended that mathematics teachers are expected to apply the Project Based Learning learning model and prepare teaching aids in the learning process, besides that mathematics teachers should be able to understand the level of interest in learning students in learning mathematics, in order to be able to foster and improve student learning outcomes, because this research was carried out limited to students of grade V B even semester of SDN Kesambi Dalam 3 Cirebon City for the 2022/2023 academic year, it is expected to be develop this research in a wider scope.

BIBLIOGRAPHY

- Hapsari, E. E., Sumantri, M. S., & Astra, I. M. (2019). Strategi Guru Meningkatkan Hasil Belajar Menggunakan Pendekatan Saintifik di Sekolah Dasar. *Jurnal Basicedu*, 3(3), 850-860. Diakses pada 15 Juni 2023.
- Ismayani, Ani dan Nuryanti. 2016. Penerapan Project Based Learning dalam Pembelajaran Matematika untuk Meningkatkan Kemampuan Komunikasi Matematis dan Aktivitas Belajar Siswa. KNPMP I, Universitas Muhammadiyah Surakarta.

Septian, Anita Dwi & Tjang Daniel Candra & Dwiyana. Defragmentasi Struktur Berpikir Siswa Impulsif Dalam Menyelesaikan Soal Cerita, Dalam Jurnal Pendidikan (2018) <http://journal.um.ac.id/index.php/jptpp/article/view/11396/5409> ,diakses tanggal 10 Juni 2023