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Problem Based Learning (PBL) Using Lego in Presenting Data

Lado Bestra[1], Chika Rahayu[2*], Helni Indrayati[3]

[1, 2, 3] STKIP Muhammadiyah Pagar Alam, Indonesia
Correspondence: chikarayahu80@gmail.com

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Abstract

Problem-solving ability in the learning process is needed to practice Skills in finishing problems, especially in learning mathematics related to life every day. The study aims to know the application of the problem-based learning (PBL) model using Lego in the material presentation of data in Class VII SMPN 2 Pagar Alam. The research method was experimental, with design studies of one-shot cases on all categories. The subjects of this study were class VII students of SMPN 2 Pagar Alam. The sample amounted to 32 students. The data analysis used pre and post-test sheets. From the result analysis, the average value of student learning is 90.58. Thereby implementing the PBL model on the material presentation of data for the results study, students rated very well. Besides that, matter interesting when research students are excited about using Lego as a learning media in the classroom.

INTRODUCTION

Presenting data is an activity on the finishing process research results using method analysis in line with the purpose and carried out using collected data. Students still feel this material may have experienced constraints in related learning with theory application formulas in settlement problems [1]. In presenting data that requires proper interpretation and understanding to mean data generator can be accepted by students [2]. The common problem is that students often notice when calculating mean or mean. It is supported by the results of previous research, which resulted in students with skills quantitative low becomes not attractive enough to this lesson lacking interest[3]

Learning predominates, and they are more passive when learning activities occur [4]. This is, of course, inconsistent with paradigm education students currently about student learning as center learning, but still on the teacher as center information [5]–[7]. Mathematics teaching materials can be intentionally designed, built, and structured to help convey and understand mathematics concepts and principles [8], [9]. One educational tool that can use the moment to study math is a Lego stand for explaining mean or medium, where legos are a game disassembly [10], [11]. In this research, Lego calculates the mean or average as a learning medium delivered from the supposition model that students can understand to abstract models in the count use formula.

So much fun building and playing Lego stimulates creativity, cultivates collaboration, and enables teachers to focus on the learning process [12]. The 2013 curriculum provides opportunities for students to build level concept learning observation, questioning, gathering or experimental

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collection, giving information, processing, and communication. Besides that curriculum also recommends the use of learning-based problems. PBL is a learning model in which students are challenged early, followed by a search process for learner-centered information. PBL demands students to problem-solving through independent research to strengthen skills, think creatively about problem-solving, and form solutions for the problem as knowledge and concepts urgent for study [13]. In solving problems in the PBL model, yes must work in a tiny group, identify what they know or no in know, and learn in problem-solving [14]

Ability settlement of significant problems, especially in learning mathematics [15]. However, the importance is not on the results of the attainment process. Where is the Program for International Student Assessment (PISA)? Achievement assessment competence in Indonesian mathematics is still very low. Study results in bad students Become a problem because teaching and learning activities in the classroom are still monotone. In the learning process, the teacher uses less talk variative so that students feel bored and bored, influencing the spirit of learning and being challenged to get guidance [16]. Should when teach material mean or mean, the researcher use tool prop or legos so a student interested in studying the mean or mean and use the learning model

This research aims to look at how the application of Problem Based Learning results in the study of mathematics using Lego as a learning medium in the learning process of material data presentation. Problem-based learning (PBL) can increase results in the study group and this individual because PBL provides meaningful contributions for the group, like arranging tasks, managing conflict, negotiating agreements, and facilitating communication between individuals [17]. PBL affects activity learning and results in study mathematics students [10]. The PBL model is impactful and significant in studying learners and understanding concepts in class. The learning using Lego for vocational students is excellent [3]. Likewise, PBL can increase the results study on the material get-up room [18]. This research is for junior high school students and implementing PBL with material presenting data, calculating the data related to life daily with straightforward solutions understood by students in junior high school using Lego as a learning medium that helps them understand the material presentation of the data is the calculation of the average (mean).

METHOD

The study method was used experimentally with a design case one-shot study. Students are given pre-test and post-test for look mark results study before and after given treatment. The subjects of this study were class VII students of SMPN 2 Pagar Alam. The sample in this study is class VII-A SMPN 2 Pagar Nature, which amounted to 32 students. Data collection using pre-test and post-test for looking for percentage and average value test.

RESULTS AND DISCUSSION

Research

The researcher approached students with a question and answer, "who knows what meaning?". 5 students raised their hands Rian, Ayumi, Bunga, Revo, and Julia. Then the researcher appointed Flowers to answer a question from the researchers, and Flowers also mentioned the answer" *means* or mean part from size centralization of the data obtained through division of total all data with an abundance of data," and researchers replied, "yes, good the answer."

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After the introduction, the researcher will inform if the learning model used in this study is a PBL model for procedure learning.

Figure 1. Explaining Material Use Lego.

Figure 1 explains material learning with count mean that explains the method count mean value using Legos arranged by the given problem.

Figure 2. Splitting group

From pictures, two researchers explain that they currently share a group of 32 students into five groups, with three groups of 5 students and two groups totaling six students. After making the group, the researcher distributes LKPD to each group, where this LKPD is used as guidelines or guide work group.

Figure 3. Finishing Problem

From picture 3, students discuss in groups to distribute opinions in finish problems in LKPD. After student work on LKPD, researchers request to evaluate each group with disclosed views and thoughts about tasks in a group.

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Figure 4. Group presentation

Figure 4 shows every group's present results work group them. Group currently gives views and thoughts about the results of the discussion. At the moment of discussion, all groups follow the presentation with both, and researchers guide every medium group to present the discussion results. The group explains what has been discussed with the member group; another group listens to the medium group's presentation. Therefore, the talk is carried out using a lottery system. After the researcher has requested students conclude the whole discussion, learning learned together from the discussion in every group. This is based on opinion [19], who stated that this PBL was designed so that students can be assisted in the development of skills thinking, skills in progress problems, and become independent learners.

Student Learning Outcomes Before and After Treatment

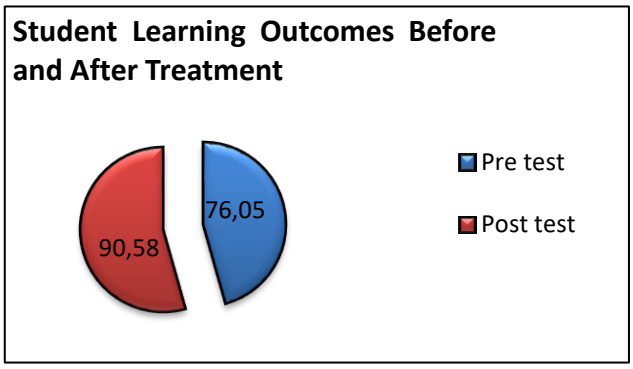

Figure 6. Graph of Student Learning Outcomes

From Figure 6, the graph shows that the mean value of the results test students before treatment is 76.05. Data obtained from the results of test form answer students for the subsequent analysis. From these data, the results are obtained study of students after applying the PBL learning model to data presentation teaching materials with a mean value is 90.58. So based on MoNE (2007) results, the study student with a mean value of 90.58 in a group with the category good very

From the results of learning conducted on class VII students. In settlement about test mathematics in the form of essays on teaching materials for the presentation of the data being taught using the PBL model using tool display lego acquire results in incoming learning in the excellent category. It is, can see from data analysis about the results of study students when applied PBL model. Learning outcomes on meeting initial mean mark student in the outstanding category.

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This matter students can define can adapt During learning by implementing learning models based problems. At a meeting second, the number of students not yet control questions and questions form about story math. This is reflected in the descent student mean score. At a meeting, beginning with search materials formula representing data, and encounters second with teaching materials, using formula means students are already capable of using the found concept.

At a meeting third held test ending consisting of all data presentation teaching materials. Results test students give a mean score of 90.58. According to the Evaluation Category Ability Student presented by the Ministry of Education, grades, 85-100 include the category Ability High Student. From the evaluation achievement study student, results in study students after implementing the PBL model on data presentation teaching materials are classified as very good with a mean value is 90.58. Research conducted by Djonominarto [20] states that there are significant results between students who use PBL learning models and students who do not use PBL or conventional learning models. The results of a study conducted by Wardani [21] state that lego games can improve students' understanding of mathematics. Based on the explanation above, it can be concluded that implementing the learning model PBL through tool display Lego on teaching materials positively influences learning math.

Discussion

Mathematics learning in schools is often associated with the problems of everyday life. In general, The problem is presented in the form of story problems. Question stories present everyday life problems because implementing mathematical concepts will be more straightforward if connected with contextual issues. The ability to learn Mathematics at this level consists of proficiency in mathematics and is followed by learning materials. In this case, math skills Include reasoning, communication, solving abilities problems, related knowledge, and an attitude of appreciating the usability of math itself.

Ability in problem-solving requires skills that involve analyzing, interpreting, reasoning, predicting, evaluating, and reflecting. This is in line with Muhammad Ashari [22], the aim of mathematics subjects so that students have five abilities, namely: (1) understand mathematical concepts, explain the interrelationships between concepts, and apply them in problem-solving, (2) use reasoning on mindset and traits, perform mathematical manipulation in making generalizations, composing proof, or explaining mathematical ideas and statements, (3) problem solving which includes the ability to understand the problem, designing mathematical models, completing models, and interpreting solutions obtained, (4) communicate ideas with symbols, tables, diagrams, or other media to clarify conditions or problems, (5) have an attitude of appreciating the usefulness of mathematics in life, i.e., Have curiosity, concern, and interest in learning mathematics, as well as tenacity and confidence in problem-solving.

In addition, in developing the creativity and competence of participants' students in learning mathematics, educators should be able to provide an effective and efficient presentation of lessons by curriculum and student mindset. This is in line with Brunner (in Dewi, 2013:129-141), which says that learning mathematics is about mathematical concepts and structures contained in the material learned and looking for relationships between concepts and structures of mathematics. In this case, each concept must be related to other concepts so that more students can make connections marked by each student's activity, which will arise when the teacher gives a

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problem to the participant's students so that students can develop a mindset that is owned independently. This process starting from this experience, provide the broadest possible opportunity for students to construct a must-have experience.

In the skill dimension, students must have the skills to think and act independently creative, productive, critical, independent, collaborative, and communicative through a scientific approach according to the relevant stage of child development with the assigned task. Several factors influence the learning success of students.

Some of these factors can come from the students or the teacher as an educator. Among the factors that come from the teacher is the ability to design learning that can grow student learning motivation, create an engaging learning atmosphere, and be pleasant. However, in reality, students still think Mathematics is scary, so it is hard to learn and understand. This happens because educators cannot package learning mathematics as more fun to attract students' attention so that students' learning achievement is not as expected.

Given the importance of mathematics, teachers should create innovative learning and practical learning that will be carried out in class. To overcome these problems, it is necessary to have a learning process that is going well, which focuses on the development of interest in student behavior based on the needs of the students themselves. There is a lack of learning innovations carried out by teachers, so students tend to be passive during the learning process. Lack of student interest in mathematics is considered one problem that becomes an obstacle for students in following the learning process.

In this case, the problem is caused by a lack of internal teachers exploring the material to make it attractive. In this problem, a teacher must be a good facilitator, providing a variety of teaching strategies so that students become interested in following the learning process.

The tendency of students who prefer to play in the classroom also becomes one obstacle in following the learning process. Teachers should be able to use this tendency to support the learning process, where teachers can innovate learning media into a variety of fun children's games. So that students become active in participating in learning through fun games. As an alternative effort to solve the problem mentioned, the selection of learning models for a learning activity teaching must also be considered. Because the application, where this learning model is a model *student*-centered learning *center,* is profound. Its application must be based on a problem as a stimulus *for* students to study. These problems are taken from actual events
in life around learners as well as learning that emphasizes investigative activities in problem-solving. In practice, the application of this model is supported by the use of media learning in the form of lego games, where these games tend to be frequently encountered by students in the surrounding environment, so besides this game

fun also assessed can be used to develop the ability to think so that it will directly make it easier students to understand the material and be able to train students to develop their cognitive abilities.

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CONCLUSION

According to data analysis and discussion, applying the PBL model increases students' mathematics outcomes. This can be seen when meeting first. Students are still confused and yet control material. After meeting two with visible PBL, there was an increase in students who began to understand and use their concept of find. The PBL model, through tool display lego on teaching materials, means produces tremendous influence for learning math. However, practice needed time to explain the game in learning to aim learning could deliver well. Students are very enthusiastic about playing with Lego with form building. Required several instruction activities that have been planned to aim learning achieved.

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