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APPLICATION OF PROBLEM-BASED LEARNING MODEL TO IMPROVE COGNITIVE SCIENCE LEARNING OUTCOMES

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Abstract

A problem-based learning model is a learning model that introduces learning from phenomena faced by students so that students can understand contextually and improve their cognitive abilities. This study aims to improve students' cognitive learning outcomes using Problem-Based Learning (PBL). The type of research used is the analysis of class action research descriptions. This research design uses the Kurt Lewin model. The subject of this study took class VIII-H, which consisted of 32 students at SMP Negeri 3 Bangil. Data collection techniques used were pretest and posttest. Data were analyzed descriptively and presented in tabular form. The results showed an increase in students' cognitive learning outcomes; in cycle one, it was 62% with an average score of 78.75; in cycle two, it increased to 90% with an average score of 86.71. This means an increase in cognitive learning outcomes. Thus, using the Problem-Based Learning (PBL) learning model on digestive system material can improve the cognitive learning outcomes of class VIII students of SMPN 3 Bangil.

Keywords: *Problem Based Learning (PBL), Learning Outcomes, Digestive System.*

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INTRODUCTION

The success of the implementation of education cannot be separated from the teaching and learning process, which includes several interrelated components, including objectives, learning materials, learning methods or strategies, media and evaluation, according to Wina Sanjaya (2011). As educators and education practitioners, teachers are free to utilize various approaches and learning methods that can foster students' interest, process skills, attention, and activeness so that the learning process becomes more meaningful (Yandri, 2022). However, in the results of observations conducted at schools during PPL 1, strategies used by teachers in the teaching and learning process still needed to be more appropriate to provide maximum understanding of knowledge to students.

The low learning achievement of students on daily test results indicates this. It was found that students in the class who felt bored quickly were one of the causes of the failure to achieve maximum learning. One of the efforts made by teachers to make students interested in following lessons so that learning outcomes increase is the use of learning methods according to the needs of students and following the material being taught. One method that can be applied is the Problem-Based Learning model. According to Nurhadi et al., as quoted (Kusmiati, 2019), Problem-Based Learning (PBL) is a teaching approach that uses real-world problems as a context for students to learn critical thinking and problem-solving skills as well as to acquire essential knowledge and concepts from the subject matter. With the information students have about the learning objectives, they can form new and meaningful knowledge by linking the environment around them with existing material.

Based on research conducted by Darmawan et al. (2022), The Problem-Based Learning (PBL) Learning Model improves the learning outcomes of Class VIII C 1 students of SMP Islam Trijaya in the 2021/2022 Academic Year on Additives and Addictive Substances Material from Cycle 1, with a reasonably good percentage of 23%, promising 69%, and very good 7%, in cycle two it became 73% good, and 27% outstanding, then Cycle 3 38% good and 62% very good. So, applying the Problem-based Learning (PBL) model can improve student learning outcomes. The learning process carried out previously by students is conducive and suitable, and the student responses are good and active. However, learning outcomes need to be improved, so the researcher tried to improve the learning model applied in science learning in class VIII SMPN 3 BANGIL by conducting Collaborative Classroom Action Research (PTKK) using the Problem-Based

Learning model method, which is expected to improve students' cognitive learning outcomes in the science subject of the digestive system material in class VIII SMPN 3 BANGIL.

RESEARCH METHOD

This research is a Collaborative Classroom Action Research (CAR In Indonesian known as Penelitian Tindakan Kelas or PTK). CAR itself or Classroom Action Research is an observation of learning activities by providing an action that is deliberately presented in the classroom to then be used as an intervention in the class and used as a solution based on problems in the class regarding the learning process and data is analyzed descriptively and presented in table form. In this research activity, the author collaborated with the supervising teacher to synergize and observe in class activities that have been intervened, so that the research presented is a Collaborative Classroom Action Research with the supervising teacher. This study uses the Kurt Lewin model through four stages, namely: planning, action implementation, observation, and reflection. Then the target object of this research is students in class VIII SMPN 3 BANGIL. Data collection techniques use observation and tests. Observation is an assessment technique for the achievement of student attitude and skill competencies.

In addition, observation activities are also carried out to assess the level of learning implementation. Written tests are data collection techniques used to obtain data or information to be collected. The test instrument used is in the form of descriptive questions. Written tests are carried out before and after the implementation of the learning process. Data collection instruments include observation sheets for the implementation of learning, descriptive written tests for the pre-cycle pre-test, cycle 1 post-test and cycle 2 post-test totaling 5 questions. The Minimum Completion Criteria at SMPN 3 BANGIL for learning completion if students get a score of ≥ 75 then they are categorized as having completed. The Minister of National Education stated that learning completion in a classical manner if in the class there are ≥ 85% of the total number of students who have completed. Learning outcome data were obtained from the final test in the form of descriptive questions totaling 5 questions.

According to the Minister of National Education, learning completion is classical if there are ≥ 85% of the total number of students who have completed it individually in the class. So, a class is said to be completed if ≥ 85% of students have achieved a completion score of 75. A score of 75 is the Minimum Completion Criteria (KKM) score set.

RESULTS AND DISCUSSION

This study applies two cycles with a cycle flow starting from planning, implementing actions, observing, and reflecting. This study applies a learning process using the PBL model. The PBL syntax, according to Trianto (2011), is Orienting students, Organizing students to learn, Guiding individual and group investigations, Developing and presenting results, and Analyzing and evaluating the problem-solving process.

In the pre-cycle, the researcher consulted with the supervising teacher regarding the learning outcomes of students and classes that could be observed for the study, namely class VIII H. Continued by profiling students to determine the characteristics of students and conducting a pre-test consisting of 5 descriptive questions. Data obtained from students < minimum completeness criteria (KKM) of 53%, exact KKM 22% and> KKM of 25%. The learning process in cycle 1 begins with the teacher giving problems by providing news related to obesity experienced by Satpol PP Bangil; students are involved in identifying what problems arise in the news with teacher guidance that leads to problem-solving. With many problem-solving options from students, the teacher guides the narrowing of solutions from the problem-solving by "eating according to the portion needed by the body". The next phase is organizing students by forming groups, conditioning groups, and providing LKPD. Then, students follow instructions and discussions in the LKPD under teacher guidance.

The next phase is guiding individual/group investigations/investigations with students in groups conducting literature reviews by analyzing solutions by knowing the daily calories consumed, calculating daily calories for breakfast menus and making a "fill my plate" plan with teacher guidance. In the phase of developing and presenting problem-solving, the teacher asks each group to present the group discussion results. In the last phase, analyzing and evaluating the problem-solving process, the teacher and students analyze and evaluate the results of each group. In cycle 1, the learning outcomes obtained with the post-test that had been

carried out were less than the KKM by 16%, 14% according to the KKM. More than the KKM by 62% of all students in class VIII H. Cycle 2 begins with the first phase, namely problem orientation, where the teacher presents problems related to news about stunting in Pasuruan Regency; students are involved in identifying what problems arise in the news with teacher guidance that leads to problem-solving. With many problem-solving options from students, the teacher guides the narrowing of solutions to the problem solving by "paying attention to food nutrition".

The next phase is organizing students by forming groups, conditioning groups, and providing LKPD. Then, students follow instructions and discussions in the LKPD under teacher guidance. The next phase is guiding individual/group investigations/investigations with students in groups conducting a comparative analysis of the food nutrition table that the teacher has provided; by comparing the tables, students look for the relationship between total calories contained, the most nutrients, the lowest nutrients, and determine healthier foods with group discussions. Next, after knowing the nutrition analyzed in food, students relate it to the digestive system and its impact if they often consume the food. In the phase of developing and presenting problem-solving, the teacher asks each group to present the group discussion results. In the last phase, analyzing and evaluating the problem-solving process, the teacher and students analyze and evaluate the results of each group. In cycle 2, the learning outcomes obtained with the post-test that had been carried out were that there were no students whose learning outcomes were less than the KKM, 10% according to the KKM, and more than the KKM, amounting to 90% of all students in class VIII-H.

The initial condition data in this classroom action research was obtained after the researcher conducted student profiling and pre-cycle tests (pretest). Then, from the results of the pre-action, several problems in science learning in class VIII H were identified; the problem that must be addressed immediately is the low learning outcomes of students. From the pre-cycle data, actions were carried out by applying the Problem-Based Learning learning model in cycles 1 and 2. After applying the Problem-Based Learning learning model, the learning outcomes of class VIII H students can be seen in Table 1.

Table 1. Student learning outcomes for each cycle

Stage	Stage Average Value Learning Outcomes	Percentage of Pre-Cycle Completeness
Pre-cycle	67,03	25%
Cycle I	78,75	62%
Cycle II	86,71	90%

Table 1 shows an increase in the average value of learning outcomes starting from pre-cycle, cycle 1, to cycle 2. In the pre-cycle, the average value only reached 67.03, which is still far below the minimum completeness criteria (KKM) that was determined at SMPN 3 BANGIL, which is 75. Then, classroom action research was carried out with the application of the Problem-Based Learning (PBL) learning model in cycle 1, which showed an increase in student learning outcomes to 78.75; this has reached the research achievement indicator, namely > 75, researchers together with supervising teachers feel that this can still be improved, then cycle two was carried out, from cycle two it was found that the average student learning outcomes increased again to 86.71.

The increase in the average learning outcomes of students is also supported by an increase in the number of students who experience learning outcome completion. Of the 32 students of VIII H, during the pre-cycle, only eight students experienced learning outcome completion with a percentage of 25%; in cycle 1, the number of students who experienced learning outcome completion increased to 20 students with a percentage of 62%, and in cycle two the number of students who experienced learning outcome completion increased again to 29 students with a percentage of 90%, then based on learning completion according to the Minister of National Education classically has been completed because the completion reaches ≥ 85% of students have achieved the KKM completion value set, which is 75.

The formation of heterogeneous groups and the involvement of students in analyzing problems and finding solutions to problems helps students better understand the material being discussed because they can actively read, search for various information to deepen the material and discuss with peers. In this heterogeneous discussion activity, there is a diversity of cognitive abilities that can help the group members. Although overall, the learning outcomes of students and the average value of class VIII H have increased, the learning outcomes obtained by each student show that not all students have increased in each cycle.

Based on the calculation of learning outcomes from the pre-cycle, cycle one and cycle 2, out of 32 students in class VIII H, five students decreased in cycle one. They increased in cycle 2, and 6 students experienced increased learning outcomes in cycle 1 but decreased in cycle 2. Various factors influenced the existence of students who experienced an increase and decrease. The different characteristics of each student result in differences in the results obtained from each student. It can be observed that the decrease in student learning outcomes is because the students concerned feel bored during the implementation of the Problem-Based Learning (PBL) learning model; they seem less enthusiastic during discussion activities and are less focused on the teacher's explanation. Therefore, in classroom learning, teachers can use other learning models that are more varied and innovative to obtain better results. Collaborative Classroom Action Research with the Problem-Based Learning (PBL) model follows the constructivist learning theory; PBL encourages students to construct their knowledge through real problem-solving problems. Of the several constructivism theories, the most appropriate from the learning process that has been implemented is the constructivism theory, according to Vygotsky, because when students are involved in discussion activities carried out in each cycle, they will exchange opinions and information so that students can find the concept of the material. From the discussion results, it can be concluded that applying the Problem-Based Learning (PBL) learning model can improve student learning outcomes in science subjects and digestive system material for class VIII-H at SMPN 3 Bangil.

CONCLUSION AND RECOMMENDATION

A. Conclusion

Based on the results of the research that has been conducted, the application of the Problem-Based Learning (PBL) learning model can improve student learning outcomes. These results are shown through the cognitive posttest of students during the learning process. From these learning activities, there was an increase in completeness and learning outcomes in each cycle. This influence shows that there are good results for students' cognitive. This can be seen in each cycle, where the percentage of students with complete learning outcomes and above the KKM increases. From the results of this study, the Problem-Based Learning (PBL) learning model can improve students' cognitive learning outcomes in the digestive system material for class VIII H at SMPN 3 Bangil.

B. Recommendation

Future researchers can use the Problem Based Learning model to improve students' critical thinking skills which are needed in developing 21st century skills.

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