

Improve Student Learning Competencies Using the Problem Based Learning Model in Class VIII Junior High School (SMPN 15) Kerinci

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ABSTRACT

The purpose of this study was to determine of problems in biology learning at SMPN 15 Kerinci. The study was conducted in January 2019. This type of research is quasi experimental research. The population was students in grade of SMPN 15 Kerinci registered in academic year 2018/2019. For the sample because it consists of two classes, all classes are sampled. Then, VIIIA as the experimental class and VIIIB as the control class. The instruments used are in the form of tests and non-test. Data analysis was performed using the t test, two-way ANOVA test and Mann Whitney U test. The findings indicate that there is a significant difference between the biology competencies of students in the experimental class and the control class, where the biological competencies of students in the experimental class are higher than in the control class. Assessment is carried out on student competencies such as aspects of knowledge, attitudes, and skills. On the knowledge aspect the average score of students in the experimental class was 78,77 and in the control class it was 71,92. Furthermore, for aspects of student attitudes, the average score in the experimental class was 83.18 and in the control class was 73,08. Where as in the aspect of skills, the average score in the experimental class was 83.89 and in the control class was 77,64. So, it can be concluded that biology learning with Problem Based Learning model can improve student competencies in aspects of knowledge, attitudes and skill.

Keywords: *Biology Learning, Competence Learning, PBL.*

1. INTRODUCTION

Education according to law No. 20 of 2003 is a conscious and planned effort so that students can actively develop their potential to have the spiritual strength, personality, intelligence, and skills needed by themselves and the community. If we want to improve achievement, surely we will not be separated from efforts to improve the quality of learning in schools. The entry into force of the 2004 Competency-based curriculum which has been revised through the Education Unit Level Curriculum (KTSP), demanding paradigm changes in education and learning, especially in the types and levels of formal education. The change must also be followed by the teacher responsible for organizing learning in schools.

Given the theme of curriculum development in 2013 is that it can produce productive, creative, and innovative Indonesian people. The 2013 curriculum focuses on the scientific education approach, which is an approach that emphasizes the five steps in gaining knowledge, namely observing, asking questions, gathering information, reasoning, communicating (Al-Tabani, dkk, 2014: 10). Considering the importance of learning biology, efforts are needed from various parties to improve the quality of biology learning in schools, including: improving the curriculum, conducting training for teachers, adding

educational facilities and infrastructure, and developing various learning methods.

Based on researcher interviews on March 19, 2018 with 24 students of class VIII of SMP Negeri 15 Kerinci, it is known that students generally like biology lessons because they are relevant to daily life. Students still consider biology as memorization as a result, students have not been able to think critically, logically and be scientific in solving problems that occur in everyday life related to biology. Therefore, strategies are needed in motivating students to think critically, logically and be scientific so that the biological competence of students increases.

Observations and interviews conducted by researchers on March 19, 2018 with 3 biology teachers at Kerinci 15 State Junior High School, it is known that learning is still centered on the teacher, where the teacher is still using the conventional learning model of delivering material with discussion, lecture, question and answer methods and then it is ended by giving. A small number of students who appear active in the learning process such as the willingness to ask questions, respond to questions. Lack of students' ability to work together, students generally tend to accept whatever is conveyed by the teacher, and there are still many students who need guidance and direction in completing assignments or questions. As a result, many students are not serious about learning. This results in the lack of good participation or interaction between student

and teachers or students and students in the implementation of biology learning.

The process of learning biology in class VIII SMPN Kerinci 15 more emphasis on the knowledge aspects of students only, while the aspects of attitudes and skills are less heeded. The weak ability of students is not only due to the low desire of students to explore biological concepts through the process of thinking, it is also influenced by the weakness of the students' initial abilities. If the initial ability of students is low, it will affect the process of forming new understanding of the students themselves.

This is because, the initial ability is the foundation in forming a new learning concept. Students who have high abilities seem to dominate so that when the learning process takes place, students who are willing to present in the future are just the same things. And vice versa, students who have low / passive abilities do not take advantage of opportunities that exist to develop their potential so that makes students more passive and dependent on their peers who are considered capable.

Based on these problems, it is necessary to have an effort to improve the quality of biology learning. One effort that can be done by teachers to be able to help students to be active and better understand learning material is to use the Problem Based Learning model. With the Problem Based Learning model students are given the opportunity to solve problems in a collaborative environment, create a mentality for learning, and form independent learning habits through practice and reflection (Yew and Goh, 2016). This is in line with Mountinho's (2015) research which states that through Problem Based Learning students can gain experience in dealing with problems that exist in real life, and emphasize the use of communication, cooperation, and various available sources to formulate ideas and develop abilities.

In Problem Based Learning that is used there must be teaching materials that are supporting, namely LKPD. With the teaching material that is LKPD as a learning resource that can support students' critical thinking and construct understanding with learning activities that include the syntax of the Problem Based Learning model.

In the learning process, teachers are faced with the initial ability of diverse students that is possible to influence the learning process and competence. The initial ability can describe the readiness of students in receiving lessons to be delivered by the teacher. How new material can be well studied depends on what is known (Slameto, 2010: 25). Thus, the initial ability of students is a prerequisite students have to be able to take lessons, so that they will achieve better learning competence.

The initial ability and learning model are two things that are very important to be considered by the teacher before starting the learning process. Initial ability is the result of learning obtained before getting a higher ability (Astuti, 2015: 7). The initial ability of students is a prerequisite for participating in learning so that it can carry out the learning process well. A person's ability is gained from training during his life, and what is brought to face a new experience.

Based on the background that has been described, the research is conducted with the title "Improve Student Learning Competencies Using the Problem Based Learning Model in Class VIII SMPN 15 Kerinci".

2. METHODS

The population in this study was students of class VIII SMPN 15 Kerinci registered in the academic year 2018/2019. The sample used in this study was students of class VIII consisting of two classes, class VIIIA as the experimental class and class VIIIB as the control class. The instruments used were test and non-test. Data analysis was performed using the t test, two way anava test and Mann Whitney U test.

3. RESULT AND DISCUSSION

The data obtained in this study are learning competencies aspects of knowledge, attitudes and skills of students in the experimental and control classes. Student Knowledge Competency Data Student knowledge competency data is presented in Table 1 below.

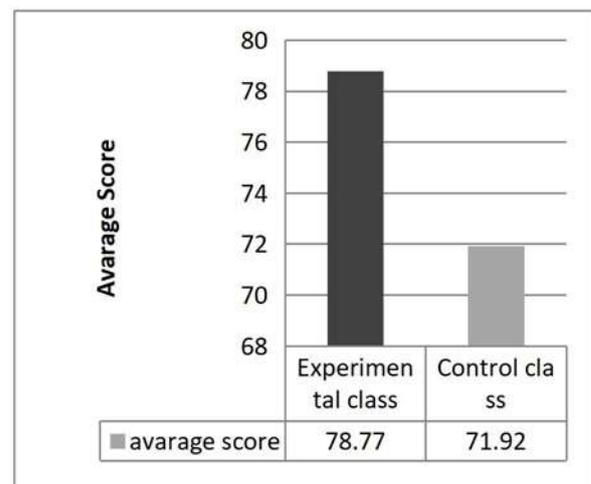


Figure 1. Average Score of Students' Knowledge Competence

Assessment of students' knowledge competence is done using test questions. Based on Table 1. and Graph 1 above, it is clear that the average score of students of knowledge competence in the experimental class is higher than in the control class, which is 78.77 in the experimental class and

71.92 in the control class. This shows that the competence of the knowledge domain of students in the experimental class using the problem based learning model is higher than the control class by using conventional models based on initial high and low ability. This is because the problem based learning model is a learning approach that presents contextual problems, thus attracting the attention of students to learn. This is in line with Dewi, Eka and

Jatiningsih (2015), which states that PBL has special characteristics that produce a product and present it to the class. Problem solving activities in PBL are good techniques for students to understand learning material. It makes students find their own knowledge so that the learning process becomes more meaningful. (Aswan, Lufri and Sumarmin, 2018).

The problem based learning model is a student-centered learning approach that empowers students to conduct research, integrate theory and practice, and apply knowledge and skills to develop solutions that are feasible for specified problems (Savery, 2015). While other opinions state that Problem Based Learning is learning done by exposing students to real problems in daily life, so students can compile their own knowledge in solving problems and seeking various kinds of solutions, which encourage students to think creatively (Purnamaningrum dan Sri, 2012: 40). Learning models that can motivate, challenge, and be fun for students as a result of the learning process by understanding or solving a problem (Norman dan Schmidt, 2000).

Initial ability is the knowledge and abilities that students have before they move on to the next level (De Cecco, 1968). Initial ability is the knowledge and skills that students have at the time of learning a new knowledge and skill (Davis: 1974). The initial ability is gained from previous learning experience needed as a prerequisite for knowing changes (Syah, 2009: 121).

The learning process in the problem based learning model and the initial ability assisted by LKPD which is a form of independent training provided, can be used to attract the attention of students to think more critically and understand concepts. LKPD is given to each group, adapted to the learning model used. LKPD distributed to each group contained problems and questions related to learning material. This facilitates students in conducting group discussions and collaboration with each group, and makes them more active in learning (Toman, 2013).

Learning activities with the problem based learning model have five main steps that begin by introducing students to the problem and ending with the presentation of students' work. The five steps are: students' orientation to the problem, organizing students to learn, guiding individual and group investigations, developing and presenting their work, and analyzing and evaluating the problem solving process (Trianto, 2014).

At the student orientation stage on the problem, the teacher gives the problem to students in the form of discourse, then students are asked to understand the problems that have been provided on the problem discourse sheet. The activity carried out by students is to find the problems contained in the problem sheet. Then students solve the problem together and express opinions in accordance with their experience so far through the explanation given by the teacher. Students dare to give a complete explanation for incorrect answers. Giving a real problem will stimulate curiosity, the desire to observe, and the desire to be involved in a problem will be even greater (Ibrahim dan Nur dalam Lufri, 2010).

At the stage of guiding individual and group investigations at this stage can improve students' critical thinking skills, this is because at this stage the teacher invites students to discuss the most appropriate strategy to solve the given problem, then look for information about the causes and consequences of the problem which exists (Raine dan Symsons, 2005).

After students find alternative solutions that are used to solve problems, students conduct investigations in groups to find the right solution for the problem. At this stage, students are also asked to draw conclusions from the problem solving activities undertaken. The next stage is students are asked to develop and present their work (Raine and Symsons, 2005).

When the selected group discussion (presenter) will read the questions or problems found, then read out the problem solving. One group of presenters presents the answer to the question the results of the discussion in front of the class while students from other groups listen to the answer to each question that exists (Sanjaya, 2006). When the selected group discussion (presenter) will read the questions or problems found, then read out the problem solving. One group of presenters presents the answer to the question the results of the discussion in front of the class while students from other groups listen to the answer to each question that exists (Slameto, 2010).

After the presenter presents the results of solving the problem, if the information received is not appropriate, then other students add or correct, even ask about the problem being discussed by the presenter by adjusting their understanding of the material and resolving conflicts that occur in the discussion afterwards the teacher will emphasize the material discussed. At the end of learning the teacher guides students to conclude the subject matter by asking for student participation (Raine and Symsons, 2005). Thus the problem based learning model is directed to search for problems and find solutions to problems that are found together and learning is more centered on students and teachers only as facilitators and moderators. Learners must identify their learning needs, help plan classes, lead class discussions, and assess their own work and work needs of classmates. Based on this, it appears that the involvement of students in the learning process is actively participating in each process of collaborative learning and is student-centered. This shows that the problem based learning model can spur students to think in solving problems. This is in accordance with the steps contained in the problem based learning model that is able to support the development of students' thinking skills (Masek, 2010).

In the control class competency knowledge is lower than the experimental class because in the control class that uses conventional learning models and initial abilities. This can be seen from the results of student tests, students find it difficult to solve problems because the teacher does not give homework assignments, only asks students to read the material being studied by the school later. Not all students have the will to read the material, so that the student's learning capital is low.

This results in students need a long time in solving problems provided by the teacher, students must open the book first, read the material in accordance with the existing problem. Then understand the problem, and note if the problem has been found the answer, so that a lot of time is used in orientation to the problem and investigation of the problem, while the development and presentation of the work and evaluating the problem solving process is not achieved optimally.

The teacher overcomes the problem by giving students time limits in orientation to the problem and inquiry into the problem, but the time given is not enough to solve the problem given by the teacher. There are some groups that are finished in problem solving some other groups are not finished in problem solving some other groups are not finished in problem solving, so in the process of developing and presenting their work and evaluating the problem solving process the teacher is more extra to direct students in the problem solving process. This resulted in not all students being active in the discussion, only students who were smart dominated the learning process.

In other words, the learning process in the two sample classes, namely the experimental class and the control class there are significant differences. The experimental class using the application of problem based learning models has an average value of knowledge aspects better than the average value of the competence of the control class using conventional learning models.

Student Competency Attitude Data

Data on students' affective competencies are presented in Figure 2 below.

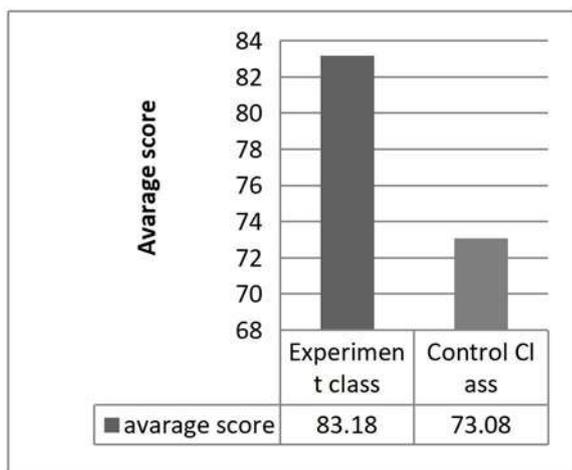


Figure 2. Average Score of Students' Afektif Competence

The attitude competency assessment is a supporter of the learning process used. Performed by the observer during the learning process in class. Based on Table 2 and graph 2 above, it is clear that the average score of affective competency students in the experimental class is higher than in the control class, which is 83.18 in the experimental class and 73.08 in the control class.

Based on observations of the competency domains of the students' attitudes carried out by the observer, obtained data of the competency domains of the attitudes of the students in the experimental class were significantly better than the students' competency attitudes in the control class. The realm of competence in the attitude of students in the experimental class as a whole gets good criteria. Curiosity of students towards the discussion material makes students become focused and active in the learning process, responses, and answers to problems that arise in the learning process. The high cooperation in the discussion, because students are responsible for solving problems and answering questions that have been given (Kunandar, 2013: 103).

In the learning process students solve the problems given by the teacher so that when the orientation process of students on the problem is focused on the problem given, students are confident in conveying the solutions to the problems encountered. Students sit quietly and carefully follow the course of the discussion. In discussing students also look responsible and earnest in solving problems, students socialize with each other well and enthusiastically contribute their opinions to solve the problems that have been given in the discussion. During the discussion where the teacher guides the group investigation, the teacher only directs a little bit to the solution of the problems found, because the students work together to convey the understanding that has been gained in the learning process. Cooperative learning requires students to cooperate optimally in accordance with the circumstances of the group (Anas, 2018), whereas cooperative learning encourages students to work together and learn in groups (Imron, 2018).

In the learning process, when students develop and present their work, students are more confident in conveying problem solving and other students also listen. This shows the curiosity of students about the problems encountered in the learning process. Students are active in asking questions that are appropriate to the problem. When students do not understand about solving existing problems, other students add. Problem-based learning can develop the ability to think in providing more detailed and clear explanations in accordance with the knowledge they have so that they can understand the meaning behind an event, especially in learning (Wood, 2003).

In the learning process the students control class solves the problem given by the teacher but the students are less focused on the problem given, the students lack the confidence to convey the problem solving encountered. In discussing students also look less responsible and not serious in solving problems. Students do not cooperate with each other in conveying the understanding that has been obtained in the learning process.

This shows that the application of the problem based learning model of learning can maximize the competence of the students' attitudes. This learning model provides a different atmosphere in the learning process, because each student has responsibilities so that fostering confidence to ask questions or respond to the opinions of friends.

Based on these explanations, it can be concluded that the learning competency of the attitude of students who follow the problem based learning model is significantly better than the learning competence of the attitude of students who take conventional learning.

Student Skills Competency Data

Data on students' psychomotor competencies are presented in Figure 3 below.

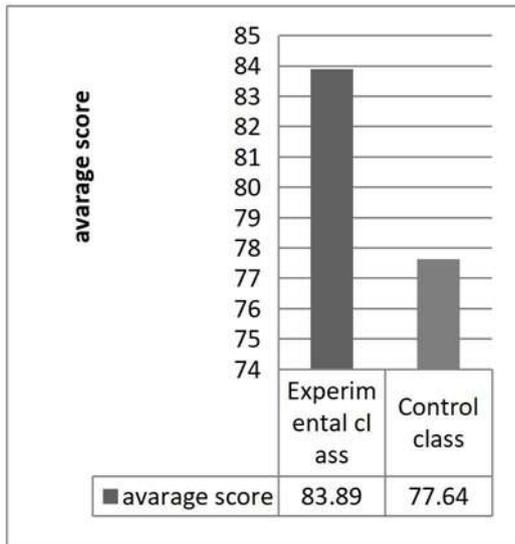


Figure 3. Students' Psychomotor Competence

The assessment of students' competency skills is carried out using observation sheets. That was done by the observer during the learning process in class. The aspects assessed are communication, discussion and report presentation. Based on Table 3. and Graph 3 above, it is clear that the average score of students' competency skills in the experimental class is higher than in the control class, which is 83.89 in the experimental class and 77.64 in the control class. That was caused by the existence of problem solving activities during the learning process. In terms of activities, students are asked to develop and present the results of discussions in front of the class, while other

4. CONCLUSION

Based on the results of the study, it can be concluded that the Problem Based Learning model of learning can significantly enhance biology learning competencies on student competencies.

ACKNOWLEDGMENT

Thanks to Dr. Linda Advinda, M.Kes as advisor, Dr. H. Syamsurizal, M.Biomed and Dr. Ramadhan Sumarmin, S.Si., M.Si as kontributor, and SMP Negeri 15 Kerinci as location of the research.

students are asked to respond to the results of group discussions presented. This is in line with Dewi, Eka and Jatningsih (2015), which states that PBL has special characteristics that produce a product and present it to the class.

The results of the competency assessment of the students' realm of skills conducted, obtained data on the competency skills of the experimental class students were significantly better than the control class. The competence of the realm of student skills in the experimental class as a whole obtains good criteria.

The high acquisition of student skills competency in the experimental class is a positive influence of learning using the problem based learning model where in problem solving activities, students are required to develop and present work that demands student creativity. Not much different from the opinion expressed by Raine and Symsons (2005) that the problem based learning model has the characteristics of independent learning outcomes, each group member shares information obtained with other group members, then determines the solution or answer to the problem. At this stage skills are needed on how to summarize, discuss and review the results of group member discussions to later be presented in the form of attachments.

The problem based learning model has a special characteristic that is producing products or works and exhibiting products (Dewi and Jatningsih, 2015). When students have creativity, the competency of learning the realm of skills will increase because the assessment of the students' competency is done through product assessment. In line with Ayuningrum (2015); Yanto and Yerizon (2018) that PBL can improve students' competency skills.

The learning process in the two sample classes, namely the experimental class and the control class there are significant differences. The experimental class using the problem based learning model has an average skill competency higher than the average score of the control class competency using the conventional learning model. Savery (2001) explains that in a problem based learning environment, students are actively involved in learning to construct knowledge and apply it in skills.

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