

IMPROVEMENT OF STUDENT LEARNING ACTIVITY AND LEARNING OUTCOMES BY USING PROBLEM-BASED LEARNING MODEL ON HUMAN REPRODUCTIVE SYSTEM TOPIC IN GRADE XI IPA 4 AT SMAN 2 SOPOSURUNG BALIGE

Ruben Eko Saputra Siregar^{*}, Binari Manurung

Program Studi Pendidikan Biologi Bilingual, FMIPA, Universitas Negeri Medan, Medan
Jl. Willem Iskandar Psr. V Medan Estate, Medan, Indonesia, 20221

^{*}E-mail : rubenchildregar4@gmail.com

ABSTRACT

This study's purpose was to improve or increase the student learning activity and learning outcomes by using Problem-based Learning model on human reproductive system topic. This research type was classroom action research due to two cycles that used. The objects were students class XI IPA 4 in SMAN 2 Soporung Balige. The data got by using multiple-choice question to measure the students learning outcomes and an instrument to observe the students learning activities. The result showed that the application of problem-based learning model can increase learning activities of students from the first cycle to second cycle of 23.06%. The application of problem-based learning model can improve student learning outcomes in sub material human reproductive system was indicated by an increase learning outcomes of the first cycle to second cycle of 19.8%. Then, the data that displayed good progress of learning mastery of student has increased from first cycle to the second cycle about 53.4%.

Keywords: Problem-based Learning, Student Learning Activity, Student Learning Outcomes, Human Reproductive System

INTRODUCTION

Based on the data that found in the last meeting of topic Reproductive System (last year) in the school showed that this topic has a low mastery level done by the students as individual completeness (only 20 students in the class can reached the minimum mastery level 76 points, amount of students in the class is 30 students) and also for classical completeness {67 % from amount of students, can reach the minimum mastery level 76 points (20 students) so classically the class were incompleted in learning outcome because there are 10 students did not completed the topic, while the completed class must have at least 24 students that reach the minimum mastery level).

Difficulties may arise from the manner or method of learning that is used is not appropriate to explain to students how to process the picture data in lesson topic that many students find that during the learning process they felt less equipped to answer the pictorial questions. It is very necessary to be focused, because the students will not only encounter the problems illustrated in the work sheet biology, but also in the matter of Daily

Examination at the school, including Mid-Semester and Semester Examination of the pictorial problems can be found in the level of the Joint National Examination and Selection of State Universities at the national level or on matters Olympiads.

Education must equip them with skills that can be used to overcome the problems they face. The capability is the ability to solve problems. This ability can be developed through learning where the problems presented in class and the students were asked to complete with all the knowledge and skills they possess.

Based on this, teachers need to design learning that is able to evoke the students' potential in using thinking skills to solve problems. One approach to learning is what is called "Problem Based Learning (PBL)". This learning approach focused on the problems presented by teachers and students to resolve the issue with all their knowledge and skills from various sources can be obtained.

The result of research by Bhahri (2014) by using Problem Based Learning model show the

improvement of average of students learning outcomes that in the first cycle found three domains give percentage affective 62.89%, psychomotor 85%, and cognitive 55%. After the research in cycle II was done, the result showed that there is a development for the three assessment aspects namely affective 79.5%, psychomotor 90%, and cognitive 85%.

Based on matter above, the research aims of this study are: to know the improvement of student activity on subject matter Human Reproductive System by using Problem Based Learning model in Class XI IPA SMAN 2 Sopoturung Balige years 2015/2016 and to know the improvement of student learning outcome on subject matter Human Reproductive System by using Problem Based Learning model in Class XI IPA SMAN 2 Sopoturung Balige years 2015/2016.

RESEARCH METHOD

Location and Time of Research. The research was conducted at SMAN 2 Sopoturung Balige located at Jalan Kartini Sopoturung Balige in May-July, 2016.

Subject of Research. The subject in this study was a class XI IPA 4 that consist of 30 students. This class include a class of problems not only in biology also on other subjects. The condition is often less conducive classroom during learning activities occur in the class. As a result of students learning outcomes and learning activity is relatively low compared with other class.

Type and Design Research. This type of research used in this research is the Classroom Action Research (CAR), which aimed to find out the learning situations that are the responsibility of the teacher.

The design of the research is as follows (Arikunto, 2006): 1) Perform observations to the school where the study to determine the aspects that support in conducting research, and 2) Preparation, the study consisted of two cycles were carried out in four stages, namely: a) planning, b) implementation of actions, c) observation, and d) reflection.

Research Variable. Independent variable of this study is problem-based learning model and the dependent variables are student learning outcomes and student learning activity in Class XI IPA 4 at SMAN 2 Sopoturung Balige.

Research Procedure. The steps of the research procedure are planning, implementation of actions, observation, and reflection. Planning, at this stage, researchers are working with teachers of Biology, to define the subject and prepare a learning device shaped syllabus and lesson plan (Lesson Plan) related to learning materials. Implementation of actions, at this stage, researchers introduced the topics and learning objectives to be delivered, and then divide students into six discussion groups, each group consisting of 5 people, then give the pretest to the students to determine the extent of students' understanding of the subject matter of the reproductive system. Observation, phase observations conducted on student learning activities, and the success of the learning model used. Reflecting, at this stage, the results obtained from the implementation phase of actions and observations collected and analyzed, so that the conclusion of the actions taken. Thus, the reflection result obtained is used as the basis for improving student learning outcomes to draft measures in the next cycle.

Research Instrument. Instrument that used in this study are test of learning outcomes is multiple choices with 30 questions and 5 choices for each question (a,b,c,d and e) also for observation sheet for measure the learning activity of students.

Technique of Data Analysis. To determine the score of learning activity and learning outcomes found by calculating the reached score divided by maximum score times 100%, then measure the mean of all data that has calculated.

RESULT OF RESEARCH

Result of research divided into learning outcomes and learning activities of student, displayed on table

Based on the data on the table 1. above, can be seen that average of student learning outcome in pre-test of cycle I was 53.8 categorize as very low

level. In pre-test of cycle I, average of student learning outcome is 67.7 and in post test of cycle II was 87.5. The increasing of learning outcome average from cycle I to cycle II was 19.8.

Table 1. Percentage of Learning Outcome

No.	Learning Outcome	Pre-Test	Cycle I (Post-Test I)	Cycle II (Post-Test II)
1	Average Score	53.8	67.7	87.5
2	Improvement of Learning Outcome	-	13.9	19.8
3	Percentage of Improvement of Learning Outcome	-	13.9%	19.8%

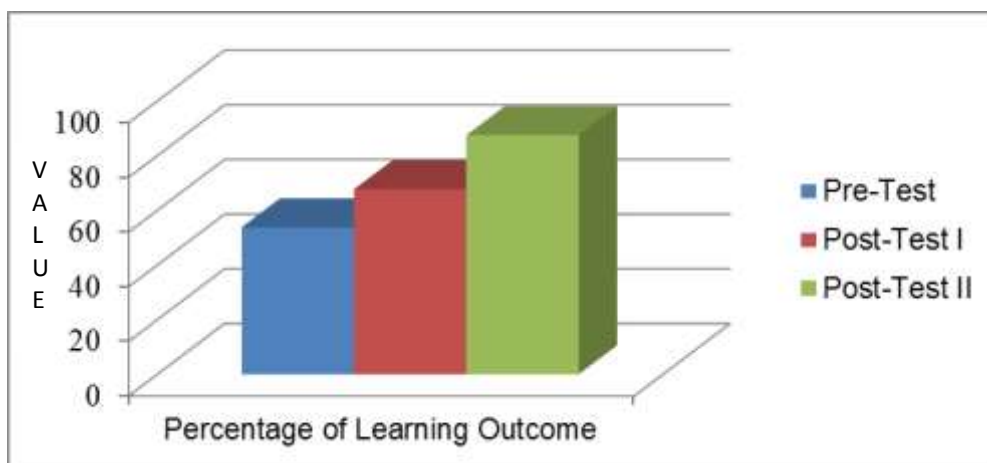


Figure. 1. Graph of Percentage of Student Learning Outcome

Table. 2. The Description of Student Mastery Level in Cycle I and Cycle II

Percentage of Achievement	Level of Achievement	Cycle I		Cycle II	
		The number of students	Percentage of total	The number of students	Percentage of total
90%-100%	Very High	1	3.33%	13	43.33%
80%-89%	High	8	26.67%	14	46.67%
65%-79%	Moderate	14	46.67%	3	10%
55%-64%	Low	2	6.67%	0	0
0-54%	Very Low	5	16.67%	0	0

Based on Table 2. can be determined in cycle I there is 1 student (3.33%) with very high level of mastery, 8 students (26.67%) with high level of mastery, 14 students (46.67%) with moderate mastery level, 2 students (6.67%) with low mastery level, and 5 students (16.67%) with very low level of mastery. There is improvement

occur in Cycle II that there are 13 students (43.33%) with very high mastery level, 14 students (46.67%) with high mastery level, 3 students (10%) with moderate mastery level, and there is no student that categorized as student with low and very low mastery level.

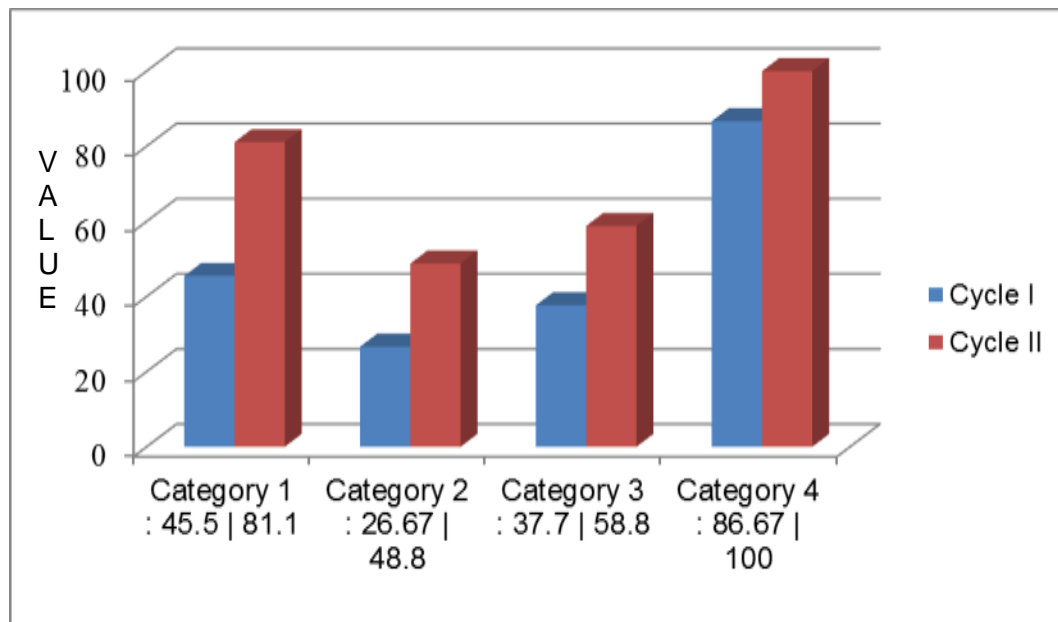


Figure 2. Percentage of Student Learning Activity

Based on Figure 2. above, can determined in cycle I, 45.5% of all descriptors of visual activity (category 1) have been done by students, 26.67% of all descriptors of oral activity (category 2) have been done by students, 37.7% of all descriptors of listening activity (category 3) have been done by students, and 86.67% of all descriptors of mental activity (category 4) have been done by students. Average percentage of students that have done all the category was 49.16%.

In cycle II, 81,1% of all descriptors of visual activity (category 1) have been done by students, 48.8% of all descriptors of oral activity (category 2) have been done by students, 58.8% of all descriptors of listening activity (category 3) have been done by students, and 100% of all descriptors of mental activity (category 4) have been done by students. Average percentage of students that have done all the category in cycle II was 72.22%. This show the increasing of activity from cycle I (49.16%) to cycle II (72.22%) by 23.06%.

DISCUSSION

Result of the study present the differences between first cycle to the second cycle by using Problem-based learning model.

Student Learning Activity. In the first cycle, the percentage of activity saw students at 45.5% which is divided into three descriptors: (1) reading the subject matter or the worksheet

provided have been carried out by 23:33% or there are seven students who did it so according to the indicators, (2) pay attention to video or slide presentation has been performed by 17 students or 56.67% according to the indicators, (3) pay attention to the teacher's explanations have been done by 17 students or 56.67% according to the indicators. There are still some students who are not serious reading worksheet that has been given can be proved through the worksheet compiled not according to the indicator, also some students do not collect note book during the first cycle has been completed. However, in the second cycle the percentage of student activity increased to 81.1% due to an increase in the percentage value of the three descriptors listed in table 4.4. This is because students are more motivated to read seriously and the more indicators of a descriptor that is achieved and also almost all the students gather his notes at the end of two cycles of the material according to the teacher's explanation and learning outcomes that have been implemented.

In the first cycle, the percentage of student activity on the oral activity of 26.67%, can be seen also each percentage of the value of the third descriptor. Students are still shy and reluctant to ask questions, provide ideas in discussion groups, and answered questions of teachers or friends, and teachers provide encouragement and motivation to students to not be afraid to ask questions,

provide appropriate ideas in group discussions, as well as answer questions. Motivation was found to increase the activity of speaking students in the second cycle which is evidenced by the increase in the percentage of the activity of speaking becomes 48.8%.

In the first cycle, the percentage of the listening activity of students at 37.7%. There were students who did not collect the notebook after the study was completed which indicated that what they hear can not be written down in a notebook and there are still students who are afraid to respond to the idea of a friend because they are not sure for their answer (fear of being wrong) even reluctant to respond question from teachers and friends for the same reason. Then the teacher tried to give appreciation for students who are willing to respond to a teacher's question and also give an approach for students who are still afraid to answer by providing opportunities for the students to answer regardless of right or wrong answer. In the second cycle, the students listening activity increased to 58.8%. Students began to dare to respond because they no longer feel blamed for the unsatisfactory answers. In addition, more students are collecting notebooks that contain information or explanation had been given a teacher.

In the first cycle, the percentage of students' mental activity amounted to 86.67%. The percentage value is quite satisfactory because it indicates that many students have matured mentally by following the instructions on the worksheet well, although some of them have not been able to analyze the problem properly, causing there is wrong concept of respond by student that written in worksheet. It is no longer found on the second cycle which scored a perfect 100% percentage which indicates that all students have matured mentally after going through the learning in the second cycle. It is proven that students can complete a worksheet to complete without any misunderstanding of the illustration shown. Another thing that supports is the right illustration to describe the process of spermatogenesis and oogenesis that cause students easily to understand then the teacher's explanations and friend

presentations also facilitate their better understanding.

Student Learning Outcomes. Based on the study results obtained in the first cycle, there are still many students who have not reached the Minimum Criteria of Mastery (76), in which only 11 students (36.67%), which reached the minimum criteria of mastery from 30 students. The low learning outcomes of students in the first cycle, due to lack of motivation and encouragement provided by the teacher to drive the spirit of student learning. Students tend to be lazy to learn because the teacher's explanations were difficult to understand and the lack of a culture of learning at home to prepare a pre-test to be faced in the second meeting. In addition, there are some students who do have less ability to absorb the lessons, so that the explanation given by the teacher is difficult to understand and influence the learning results. Students also have the capability of different activities as well, such are unable to follow the activity of learning through oral activity but very good in visual activity and mental activity, and so on.

In the second cycle, the number of students who achieve the minimum criteria of mastery increased to 27 students, or about 90%. Learning outcome is influenced by motivation and encouragement to learn given by the teacher. Teachers also provide illustrations on the worksheet in the form of problems or issues related to students' daily life, so encourage students to ask many questions and give feedback to the presenting problem. The more responses given by student, the more they know about the presented problem. The many sources of books and learning materials of the students also affect knowledge of students increases about the problem to be solved.

CONCLUSION

There are improvement of student learning activity and learning outcomes by applying the Problem-based Learning model on reproductive system topic in Class XI IPA 4 at SMAN 2 Soposurung Balige academic years 2015/2016.

ACKNOWLEDGEMENT

Special thanks and gratitude to Headmaster of SMAN 2 Soposurung Balige and Biology Teachers for participation and also the contribution of Class XI IPA 4 at SMAN 2 Soposurung Balige as the research subject.

REFERENCES

- Bhahri, M. S., (2014), Model PBL (Problem Based Learning) dengan Metode Picture and Picture untuk Meningkatkan Hasil Belajar Biologi Siswa kelas X-I pada Sub Pokok Bahasan Pencemaran Lingkungan, *Jurnal Problem Based Learning*.
- Arikunto, S., (2006), *Penelitian Tindakan Kelas*. Jakarta, Indonesia: Penerbit Bumi Aksara.
- Arikunto, S., (2007), *Manajemen Pendidikan*. Jakarta, Indonesia: Penerbit Rineka Cipta.
- Masyhud, S., (2012), *Metode Penelitian Pendidikan*. Jember, Indonesia: LPMPK.
- Sardiman, A. M., (1992), *Interaksi dan Motivasi Belajar Mengajar*. Jakarta, Indonesia: PT. Raja Grafindo Cipta.