



Problem-Based Learning Model: An Effort To Improve Student Learning Outcomes In Class XI SMA Negeri 2 Tondano

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Abstract. *The objective of this study is to assess the enhancement in student learning outcomes subsequent to the implementation of the Problem-Based Learning instructional approach in the eleventh grade of SMA Negeri 2 Tondano, located in the Sangihe Islands district, during the academic year 2022/2023. The present study is an instance of classroom action research (PTK) employing an action cycle that encompasses action preparation, implementation, observation, and reflection. The participants of this study consisted of 18 students from class XI MIPA3 at SMA N 2 Tondano. The data gathering methods encompass the assessment of student learning outcomes through the utilisation of test result data conducted at the conclusion of each instructional cycle. The data analysis was conducted using a quantitative descriptive approach. The findings of the study indicated that the implementation of questionnaires in cycle I resulted in a significant improvement in students' learning outcomes. The sample size for this phase of the research consisted of 18 participants. The completion rate of students' learning outcomes exhibited an upward trend, rising from 79.94% in cycle I to 86.27% in cycle II. The observed rise in student learning scores over each cycle suggests that the utilisation of the Problem-Based Learning model has the potential to enhance the learning outcomes of students in class XI MIPA3 SMA N 2 Tondano.*

Keywords: *PBL, Learning Outcomes, Human Movement Systems*

Abstrak. Tujuan penelitian ini adalah untuk menilai peningkatan hasil belajar siswa setelah penerapan pendekatan pembelajaran Problem Based Learning di kelas XI SMA Negeri 2 Tondano yang terletak di Kabupaten Kepulauan Sangihe pada tahun ajaran 2022/2023. Penelitian ini merupakan salah satu contoh penelitian tindakan kelas (PTK) yang menggunakan siklus tindakan yang meliputi persiapan tindakan, pelaksanaan, observasi, dan refleksi. Partisipan penelitian ini terdiri dari 18 siswa kelas XI MIPA3 SMA N 2 Tondano. Metode pengumpulan data meliputi penilaian hasil belajar siswa melalui pemanfaatan data hasil tes yang dilakukan pada akhir setiap siklus pembelajaran. Analisis data dilakukan dengan menggunakan pendekatan deskriptif kuantitatif. Temuan penelitian menunjukkan bahwa penerapan angket pada siklus I menghasilkan peningkatan hasil belajar siswa yang signifikan. Besar sampel pada tahap penelitian ini terdiri dari 18 partisipan. Tingkat ketuntasan hasil belajar siswa menunjukkan tren yang meningkat, yaitu meningkat dari 79,94% pada siklus I menjadi 86,27% pada siklus II. Peningkatan nilai belajar siswa yang terlihat pada setiap siklus menunjukkan bahwa pemanfaatan model Problem Based Learning berpotensi meningkatkan hasil belajar siswa kelas XI MIPA3 SMA N 2 Tondano.

Kata Kunci : PBL, Hasil Belajar, Sistem Gerak pada Manusia

INTRODUCTION

Education is a need that must be fulfilled in the process of life. The progress of a nation is influenced by the quality of education of the nation it self because high education can produce quality Human Resources (HR) (Noviar, 2007; A'la, 2012). Quality human resources are teachers who can make students capable and achieve learning outcomes that align with expectations. One of the school lessons is Biology (Anderson & Krathwohl, 2001; Noviar, 2015). The center of learning in Biology lessons is on students who provide opportunities for

students to actively participate in learning to increase student learning activities and student competence (Purwanto, 2010; Agustiana et al., 2013).

Student-centered Biology learning is intended to involve students in constructing their knowledge so that students are more dominant in learning (Rusman, 2013; Noviar, 2015). This can develop students' knowledge, skills, and self-confidence (Rusmono, 2012). Apart from that, the Biology learning process must be based on scientific data and facts in order to obtain meaningful learning (A'la, 2010). The Biology learning objectives to be achieved from the education process are students' Biology learning outcomes, which include the cognitive, affective, and psychomotor domains (Arends, 1997). These three domains are inseparable (Dick & Carrey, 1995). Meanwhile, Biology learning activities have yet to provide opportunities for students to play active learning roles (Dimiyati & Mudjiono, 2013). The role of teachers is still very dominant and less than optimal in using learning approaches, thus making students less active in learning, and the quality of student learning could be better (Dahar, 1998; Slameto, 2003). Students' lack of activity in learning Biology will cause Biology material to be meaningless and subsequently not be adequately understood (Sanjaya, 2010; Febriani, 2017).

These problems are in line with the results of observations made at SMA Negeri 2 Tondano that students' low understanding of the subjects being taught, students are less motivated in teaching and learning activities, especially in BIOLOGY subjects, subject teachers tend to use discussion and lecture methods, there is a lack of teacher creativity in selecting teaching methods, student learning outcomes are measured only in the cognitive aspect of students, the material discussed in the research is limited to human movement system material, there are some students who do not do the tasks given by the teacher, there is a lack of student's ability to solve problems, there are students who do not pay attention when the teacher explains the learning material.

Biology learning carried out by teachers in class is still dominated by the usual discussion method accompanied by lectures, has yet to use a variety of other learning models, and does not provide an accurate picture to students regarding the material being taught. This results in students not paying attention to the teacher and being busy with their friends, so the learning objectives are not achieved as expected. The application of varied learning models is needed to improve student learning outcomes.

The utilisation of diverse learning models might be advantageous for educators in facilitating the teaching and learning process. The successful attainment of learning targets is contingent upon the teacher's selection of an appropriate instructional model that encompasses

the content being taught, student competencies, and the resources and facilities at hand, which the teacher must incorporate as instructional materials, objectives, and scope (Huda, 2013). One pedagogical approach that might be employed is the problem-based learning model (Joyce et al., 2009). The problem-based learning model is an educational methodology that employs real-world situations as a framework for students to develop critical thinking and problem-solving abilities, while also acquiring fundamental knowledge and content from the subject matter (Kemp, 1995; Winkel, 1996).

According to Magdalena et al. (2014), it is anticipated that the implementation of the problem-based learning model will enhance students' academic achievements in the field of Biology. This is attributed to the fact that students actively engage in constructing their own knowledge during the learning process. The present study is underpinned by the findings of Magdalena's (2016) research, which demonstrates the impact of implementing the problem-based learning (PBL) instructional approach on the academic achievements of eleventh-grade students at SMA Negeri 2 Tondano in the field of Biology. Moreover, Noviar (2015) posited that the utilisation of a problem-based learning model grounded in a scientific approach has the potential to substantially enhance the educational achievements in the field of Biology. In addition, Febriani (2017) asserted that the implementation of the Problem-Based Learning (PBL) paradigm has a substantial impact on students' proficiency in problem-solving within the context of biology, specifically in the area of human movement systems. Based on the preceding discourse, scholars express their interest in conducting a study that employs the problem-based learning (PBL) model in the context of Human Movement Systems. The research is titled "The Application of the Problem-Based Learning (PBL) Model to Enhance Student Learning Outcomes in Class XI of SMA Negeri 2 Tondano."

METHOD

The type of research used in this research is Classroom Action Research (PTK). PTK was carried out at SMA Negeri 2 Tondano with research subjects totaling 18 students consisting of 10 male students and 8 female students. This classroom action research procedure was carried out in several cycles, each consisting of four stages: planning, implementation, observation, and reflection. The following steps are carried out, namely:

1. Initial reflection

This initial reflection activity was done by observing learning activities in class XI in BIOLOGY learning. In learning activities, many BIOLOGY learning activities only use lectures. Then, another activity was carried out before the research; the researcher interviewed

students regarding BIOLOGY learning. From the observations and interviews, researchers diagnosed that student learning outcomes were inferior.

2. Action Planning

From the results of the problems resulting from the initial reflection that has been carried out, the researcher, in implementing the action, will apply the problem-based learning method. The steps before acting using the problem-based learning model include the following.

- Adapt the research design to the BIOLOGY subject that will be taught.
- Guide with the supervisor regarding the research design to be carried out.
- Prepare learning instruments in the form of RPP (Learning Implementation Plan) and Student Worksheets (LKS).
- Develop research instruments (student activity observation sheets, teacher activity observation sheets, concept mastery sheets, and evaluation tests).
- Guide research and learning instruments with supervisors.
- Prepare tools and materials that will be used in research.
- Coordinate with the school and homeroom teacher to determine the time for conducting the research.
- Prepare documentation tools.
- Discuss with the observer.

3. Implementation of Actions

The implementation of this classroom action research applies a problem-based learning model to improve student learning outcomes. The implementation of this classroom action research is planned for several cycles. If the first cycle still needs to be completed, continue with the second cycle; if the second one still needs to be completed, continue with the third one. If the first cycle has yet to be completed, then no will continue in the next cycle.

The stages carried out in each cycle include:

- Cycle I
 - 1) Prepare learning by the Learning Implementation Plan (RPP), which has been prepared with the BIOLOGY subject material on human movement systems
 - 2) Discuss and convey perceptions with the observer regarding the activities to be observed.
 - 3) Carrying out learning using the problem-based learning method
 - 4) Carrying out observations: Observation activities occur when learning activities occur. A team of observers carried out observations to observe student activities, teacher activities, and improvements in student learning outcomes.

- 5) Carry out an evaluation test at the end of the learning activity.
- 6) Analyze research data and reflect with the observer. To find out deficiencies in learning activities, this activity is carried out to facilitate corrective actions in the next cycle.

- Cycle II

Implementation of actions in cycle II refers to the results of analysis and reflection in cycle I because researchers must be more detailed in the preparation and implementation of learning activities carried out in order to improve learning activities that are felt to have not been implemented and improve student learning activities. Activities carried out in cycle II include:

- 1) Carry out learning using the problem-based learning model
- 2) Carrying out observations: Observation activities occur when learning activities occur. A team of observers carried out observations to observe student activities, teacher activities, and improvements in student learning outcomes.
- 3) Carry out an evaluation test at the end of the learning activity
- 4) Analyze research data and reflect with the observer. To find out deficiencies in learning activities, this activity is carried out to facilitate corrective actions in the next cycle.

RESULT AND DISCUSSION

A. Research Results

1. Implementation of Cycle 1

The things that were done during the implementation of cycle I, which was held at the first meeting on May 11, 2023, and the second meeting on May 25, 2023, were as follows:

a) Planning

Planning is the action that the researcher will carry out; in this case, the initial stage carried out by the researcher is preparing all the requirements needed to conduct research, namely, instruments in the form of a Learning Implementation Plan (RPP), planning to learn using the Problem-Based Learning method, creating student worksheets (LKS), compiling teacher and student observation sheets during the teaching and learning process for each meeting. After all the Planning is well organized, the next thing to do is carry out actions by the plan above.

b) Implementation

The first cycle of biology learning was carried out in 2 meetings. Actions are taken after the researcher has prepared everything; in the first learning activity, the teacher gives a pre-test

to the students to see the students' basic abilities, and then the teacher begins to implement the learning process using the problem-based learning method in the learning process after the students answer several questions from the teacher.

The first meeting was held on Thursday, 11 May 2023, at 12.30 WITA, guided by the Learning Implementation Plan (RPP) in cycle I. The first learning meeting lasted (4 x 45) minutes with material on human movement systems

The second meeting was held on Tuesday, 16 May 2023, at 8.30 WITA, guided by the Learning Implementation Plan (RPP) in cycle I. The first learning meeting lasted (4 x 45) minutes with material on the structure and function of tissues in stems.

c) Observation

Student learning outcomes are obtained by applying the problem-based learning model at the end of biology learning. Cycle I could not be successful because several students still got scores below the specified KKM. This can be seen in the table.

Table 1. Cycle I student learning outcomes

No.	Indicator	Value Cycle 1
1	Highest Score	79
2	Lowest Score	55
3	Percentage	69,94%

Based on Table 1 above, it can be seen that the percentage for cycle I is 69.94%. It can be seen that student learning outcomes from the formative tests carried out in cycle I have not yet reached the KKM.

d) Reflection on Cycle I

Based on the results of observations in cycle I activities, the following were found:

- 1) Highest score: 79.
- 2) The lowest score is 55.
- 3) Students pay less attention when the teacher explains, such as some students who need to be more serious about paying attention to the teacher's explanation.
- 4) Students could be more enthusiastic in answering or asking questions from the teacher.
- 5) Students are still found chatting with friends outside of discussing material, so some students need to be more active in learning.

- 6) Teachers could be more optimal in motivating, conveying learning objectives, and managing time.
- 7) The teacher needs to be more optimal when encouraging his students.

Based on reflection from cycle I, the actions to be taken in cycle 2 are:

- 1) Teachers must be better at controlling class conditions and students.
- 2) Provide explanations slowly so that students can easily understand them.
- 3) Teachers can provide additional value to students who are active in learning so that students are motivated to learn.
- 4) To overcome students who are not yet confident in asking or expressing opinions, teachers must provoke them with questions so that students dare to ask or answer questions.
- 5) The teacher rewards students who get the highest marks and appear or advance in front of the class.

2. Implementation of Cycle 2

The things that were done during the implementation of cycle II, which was held at the first meeting on 19 May 2023 and the second meeting on 25 May 2023, were as follows:

a. Planning

Planning is the action that the researcher will carry out; in this case, the initial stage carried out by the researcher is preparing all the requirements needed to conduct research, namely, instruments in the form of a Learning Implementation Plan (RPP), planning learning using the inquiry method, making student worksheets (LKS), compiling teacher and student observation sheets during the teaching and learning process for each meeting. After all the Planning is well organized, the next thing to do is carry out actions by the plan above.

b. Implementation

The first meeting was held on Friday, 19 May 2023, at 08.30 WITA, guided by the Learning Implementation Plan (RPP) in cycle II. The first learning meeting lasted for (4 x 45) minutes with material on the structure and function of tissues in leaves. Activities carried out include:

a) Initial Activities

At the first meeting, the teacher enters the class and says hello, and then the teacher asks one representative student to pray before the lesson begins. After the prayer

is finished, the teacher checks the student's attendance one by one through class attendance; then, the teacher explains the topic and objectives of the lesson.

b) Core Activities

At this meeting, the teacher explains the material on human movement systems. The teacher helps students develop their hypotheses through several questions and is given the assignment to work on student worksheets (LKS).

When students do their assignments, the teacher goes around to see the students' activities in doing their assignments. If, during learning activities, students experience difficulties in working on questions, students have the opportunity to ask the teacher. In this case, the teacher is a facilitator, motivator, and mediator.

After each student has completed their assignment, students are allowed to present their findings with student representatives coming forward.

c) Closing Activities

In the final activity, the teacher and students conclude the material presented and remind them of the material presented at the next meeting, namely about the human movement system. Then the teacher closed the lesson by saying hello.

The second meeting was held on Thursday, 25 May 2023, at 8.30 WITA, guided by the Learning Implementation Plan (RPP) in cycle II. The first learning meeting lasted for (4 x 45) minutes with material on the structure and function of tissues in flowers. Activities carried out include.

a) Initial Activities

At the first meeting, the teacher enters the class and says hello, and then the teacher asks one student representative to pray before the lesson begins. After the prayer is finished, the teacher checks the attendance of the students one by one through class attendance; then, the teacher explains the topic and objectives of the lesson.

b) Core Activities

Entering the core activity, the teacher explains the human movement system and then helps students develop their hypotheses through several questions that can encourage students to formulate answers to these hypotheses. The teacher gives students assignments to work on worksheets (LKS).

When students do their assignments, the teacher goes around to see the students' activities in doing their assignments. If, during learning activities, students experience difficulties in working on questions, students have the opportunity to ask the teacher. In this case, the teacher is a facilitator, motivator, and mediator.

After each group has finished their assignment, students can present their findings with student representatives coming forward.

c) Closing Activities

In the final activity, the teacher and students concluded the material that had been presented. They reminded them of the material that would be presented at the next meeting, namely about the structure and function of tissues in flowers. Then the teacher closed the lesson by saying hello.

c. Observation

Student learning outcomes are obtained by applying the inquiry learning model at the end of biology learning. In cycle II, it can be seen in Table 2.

Table 2. Cycle II Student Learning Outcomes

No	Indicator	Value Cycle II
1	Highest Score	91
2	Lowest Score	80
3	Percentage	86,27%

Based on Table 2 above, it can be seen that the percentage for cycle II obtained a score of 86.27. So, you can see the student learning results from the formative tests at the end of cycle II.

d. Cycle II reflection

The Implementation of biology learning in cycle II using the Problem-Based Learning method in class XI Science at SMA N 2 Tondano is by the Learning Implementation Plan (RPP) that has been prepared. When compared with the previous cycle, learning in cycle II was good. Based on the results of cycle II, the research cycle action was stopped because it was hoped that there had been an increase from cycles I and II.

B. Discussion

Based on the results of Classroom Action Research, which was carried out using the Problem-Based Learning method in class XI biology subjects. Student learning outcomes can be improved; increased student learning outcomes in Classroom Action Research prove this. The following is an overview of the results of classroom action research on class XI Science students at SMA Negeri 2 Tondano by applying the Problem-Based Learning method.

a. Student learning outcomes

Student learning outcomes from this research were obtained through formative tests. The results of observations of learning outcomes in cycles I and II can be seen in Table 3.

Table 3. Results of Cycle I and Cycle II

No	Indicator	Test Value	
		Cycle 1	Cycle 2
1	Highest Score	79	91
2	Lowest Score	55	80
3	Percentage	69.94	86.27

Based on the observations in the table above, the completeness of student learning outcomes in each cycle has increased. The level of learning completeness from cycle I was found to be 69.94, while in cycle II, the level of learning completeness was 86.27. This can be strengthened in cycle I and II research, proving that student learning outcomes increase after using the problem-based learning method in the classroom learning process. So, using problem-based learning methods in delivering material in class can stimulate and attract students' attention to participating in the learning activities. In this way, learning activities in class can be more interactive, and students can receive the messages conveyed in each material taught by the teacher, improving student learning outcomes.

CONCLUSION

From the results of learning activities that have been carried out over two cycles and based on the analysis that has been carried out, it can be concluded that the results of Classroom Action Research obtained data on the application of the Problem-Based Learning model by improving the learning outcomes of class XI Science students at SMA Negeri 2 Tondano for the 2022/2023 academic year. The level of learning completeness from cycle I was 79.94, while in cycle II, the level of completeness was 86.27.

From the research results obtained and from the previous description of the teaching and learning process in biology subjects that is more effective and provides more optimal results for students, it is presented as follows: (1) It is hoped that students will be more interested in understanding the material through their efforts in the hope of improving learning outcomes for the students themselves; (2) It is hoped that this inquiry method can be used as an alternative that can be used as a contribution of thought and information, especially to biology subject teachers, in improving activities and learning outcomes, because by implementing this inquiry method students can become interactive and can attract students' attention so that it can help students understanding. In biological material.

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