Algoritma : Jurnal Matematika, Ilmu pengetahuan Alam, Kebumian dan Angkasa
Vol. 2, No. 3 Mei 2024
e-ISSN: 3046-5427; p-ISSN: 3032-6230, Hal 12-19
DOI : https://doi.org/10.62383/algoritma.v2i3.37

Application Of The Problem Based Learning Model To Improve Student Learning Outcomes In Class VII Of SMP Negeri 8 Kei Besar On Animal Classification Material

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Abstract. *Problem-based learning is an educational approach that centers around the exploration of real-world problems, with an emphasis on finding genuine solutions through realistic investigation. The objective of this study is to ascertain the outcomes of students' learning achievement through the implementation of a problem-based learning approach, specifically focusing on the topic of animal classification. This study employs the methodology of classroom action research. The research was conducted at SMP Negeri 8 Kei Besar. The participants of the study consisted of 33 pupils in the seventh grade. The research findings indicated that the rate of classical learning achievement in the first cycle was 27%, with a mean score of 62%, while in the second cycle it increased to 81.9%, with an average score of 76%. The findings of this study demonstrate that the utilization of a problem-based learning approach in teaching animal classification can enhance students' academic achievements.*

Keywords: *Learning Model, PBL, Learning Outcomes, Animal Classification, Biology*

INTRODUCTION

Education is the main factor in the formation of the human person and is essential for developing and advancing the life of a country. Education can be interpreted as a process with specific methods to gain knowledge, understanding, and ways of behaving by needs (Suryadi, 2014; Ichsan, 2016; Judijanto et al., 2024). Learning and learning is a complex process because it is influenced by various factors (Mangelep, 2013; Hanafy, 2014; Zubaidah, 2020). To understand and improve learning methods, teachers must understand factors, namely culture, history, practical obstacles, characteristics of teachers as teachers, characteristics of students, and the nature of the learning and learning process (Mangelep, 2015; Arifah, 2018; Rukhayati, 2019).

Learning outcomes refer to the modifications in behavior and general capabilities that students acquire as a result of their learning. These modifications encompass cognitive, emotional, and psychomotor abilities, and are a result of experiential learning rather than being limited to a single component of potential. In addition, learning objectives can be defined as observable and measurable changes in students' behavior, encompassing changes in knowledge, attitudes, and abilities (Rihwayudin, 2015; Mangelep, 2017; Suprihatin & Manik, 2020).

The problem-based learning model is a pedagogical approach that centers around the exploration of actual difficulties, which necessitate genuine solutions to real-world issues (Yazidi, 2014; Rahmadani, 2019; Mangelep et al., 2020). In addition, problem-based learning

Received Maret 31, 2024; Accepted April 25, 2024; Published Mei 31, 2024
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is a novel approach to education that optimizes students' cognitive abilities through a structured process of group collaboration. This allows students to enhance, refine, evaluate, and cultivate their thinking skills consistently (Ardiyanti, 2016; Samura, 2019; Mangelep et al., 2023). Many instructors may not comprehend the concept of PBM. This may be due to a lack of ambition to enhance their knowledge or a lack of assistance from the education system to develop the scientific competence of teaching staff (Surbakti, 2014; Kurniawan et al., 2017; Mangelep et al., 2024). In this issue-based learning paradigm, students are required to actively engage in the resolution of a problem. Students undergo training to enhance their critical thinking abilities in problem-solving and understand fundamental concepts.

Based on the results of observations made by researchers at SMP Negeri 8 Kei Besar, it can be seen that SMP Negeri 8 Kei Besar is a secondary education institution that requires students to be more creative, intelligent, and think critically in the learning process. However, when the biology learning process occurs, many students feel bored because the teacher conveys and provides material through lectures while the students listen and write. This can reduce students' interest in learning. Apart from that, teachers as educators and knowledge centers do not involve students in solving real-life problems and relating them to learning material. This occurs because the learning methods applied by teachers could be more optimal. Therefore, student learning outcomes are greatly influenced by education and the teaching methods used.

Animal classification material is one of the learning materials at SMP Negeri 8 Kei Besar, and it needs to be developed through a problem-based learning model to improve biology learning outcomes so that students can think more critically and solve problems around them.

METHOD

This type of research is classroom action research. Classroom action research is carried out to improve the quality of learning practices in the classroom. Classroom action research focuses on the classroom or on the teaching and learning process that occurs in the classroom.

This research will be carried out at SMP Negeri 8 Kei Besar. This research was carried out by the educational calendar at SMP Negeri 8 Kei Besar for approximately 3 months, namely January to March 2023. The subjects in this research were students in class VII of SMP Negeri 8 Kei Besar, totaling 33 students.

The data collection techniques used in this research are observation, tests, and documentation. This classroom action research was carried out in two cycles. If student learning activities in cycle I have not been achieved, they will continue with cycle II with several stages as follows:

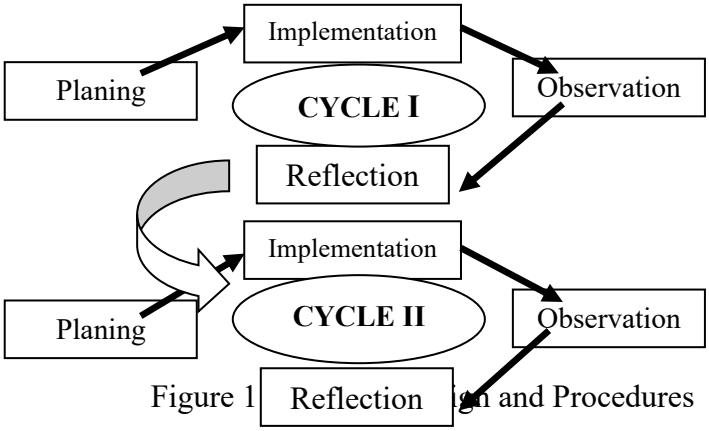

Figure 1 [illegible]n and Procedures

The data analysis technique in this research was carried out descriptively and was used to observe the results of teacher-teaching and student-learning activities. Meanwhile, the data analysis technique for learning outcomes is in the form of averages and percentages to describe student learning outcomes in learning.

RESULT AND DISCUSSION

In implementing the action, researchers have used a problem-based learning model to improve student learning outcomes at SMP Negeri 8 Kei Besar on animal classification material. This research was conducted in 2 (two) cycles. Each cycle consists of 4 (four) meetings and 1 (one) meeting divided into 2 x 45 minutes.

Classroom action research has been carried out using a problem-based learning model to improve student learning outcomes in class VII of SMP Negeri 8 Kei Besar on animal classification material.

Table 1. Average Value of Student Learning Outcomes

∑X	N	Average
2,058	33	62%

In Table 2 above, it can be seen that the average value of student learning outcomes in cycle I was 62%. This can indicate that the average value of student learning outcomes in class has not reached the requirements set at school, namely > 70. So, it can be concluded that the average value of student learning outcomes in class has not been completed.

Table 2. Analysis of Completeness of Cycle I Learning Results

No	Score	Student	Persentation	Category
1	VII ≥ 70	9	27,2%	**Complete**
2	VII < 70	24	72,8%	**In Complete**
Total		**33**	**100%**	

In Table 2 above, it can be seen that the percentage of completeness of student learning outcomes in the first cycle test was 27.2%, and the test result data shows that there were nine students who got scores of 70 and above. Meanwhile, 24 students got a score of less than 70 with a percentage of 72.8% who had not achieved completeness of the learning outcomes set at school > 70. With these results, the researcher continued the action in cycle II.

Table 3. Average Value of Student Learning Outcomes

∑X	N	Average
2,505	33	76%

In Table 3 above, it can be seen that the average value of student learning outcomes in cycle I was 76%. This shows that the average score of student learning outcomes in class has increased and is in accordance with the requirements set at school, namely 70 or more. So, it can be concluded that the average value of student learning outcomes in class has been completed.

Table 4. Analysis of Completeness of Cycle II Classical Learning Results

No	Score	Student	Persentation	Category
1	VII ≥ 70	27	81,9%	**Complete**
2	VII < 70	6	18,1%	**In Complete**
Score		**33**	**100%**	

In Table 4, it can be seen that the average score for completeness of student learning outcomes in Cycle II was 81.9%, and the test result data shows that students who got a score of 70 and above were 27 out of 33 students. Meanwhile, six students got a score of less than 70, with a percentage of 18.1%. This shows that in the implementation of cycle II, there was an increase in student learning outcomes. However, individually, there are still six students who have not achieved classical completion, and their learning outcomes are still low.

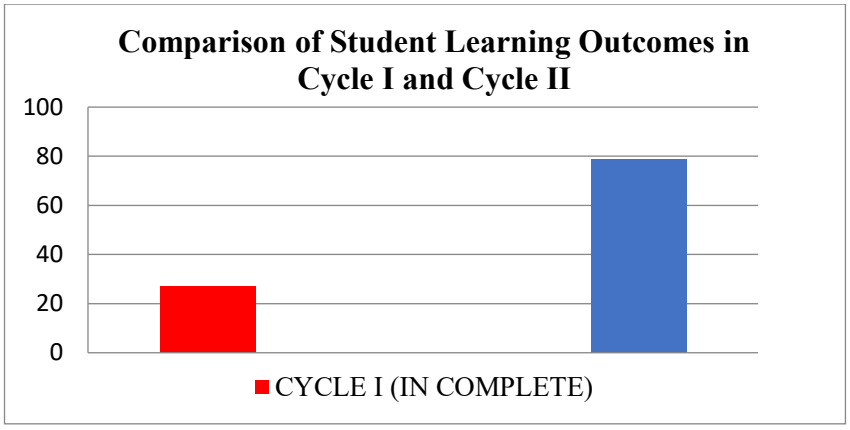

Figure 2. Learning Results in Cycle 1 and Cycle 2

In Figure 2, it can be seen that the completeness of student learning outcomes in cycle I was 27.2% or less than 70, with the criteria being incomplete. Then, learning completeness in cycle II was 78.8%, according to the complete criteria. This shows that the application of the problem-based learning model on the subject of animal classification can improve student learning outcomes in class VII of SMP Negeri 8 Kei Besar.

Results of evaluation analysis using a problem-based learning model to improve student learning outcomes. It can be measured from students' answers to the rubric for assessing student learning outcomes in animal classification material.

In the first cycle, the percentage of classical earning only reached 27.2%, meaning that only nine students completed classical learning, namely > 70, and at the time of the test, were able to give answers in separate sentences, systematically, used the correct language and got high scores in accordance with the problem-based learning assessment rubric. Meanwhile, 72.8% or 24 students had not achieved the classical completeness score, namely < 70, and during the test received a low score according to the assessment rubric because they had not been able to answer questions/questions in their own sentences, had not used the correct language, and had not been able to provide valid reasons. Correct in answering so that it does not improve learning outcomes, the researcher continues the research to cycle II.

In cycle II, researchers still used the problem-based learning model to improve student learning outcomes, which were still measured based on the learning outcomes assessment rubric applied to the answers to the test questions given at the end of the meeting. The implementation of cycle II also still uses animal calcification material. Researchers identified problems in cycle I where students lacked concentration in the learning process and in working on the Student Worksheets (LKS) given by the teacher.

The percentage of classical learning completeness in cycle II reached 81.9%, meaning that only 27 students completed classical learning, namely > 70, because, during the test, they

were able to give answers in separate sentences correctly. Meanwhile, 18.1% or six students have not achieved the classical completeness score, namely < 70, and during the test received a low score according to the assessment rubric because they could not answer questions/questions with their own sentences, did not use the correct language, and could not give reasons. The correct answer is that it does not improve student learning outcomes.

The increase in student learning outcomes in cycle II was because students were able to work together to find information from the material provided and unite the opinions of each group member, were able to think positively, and developed the habit of asking questions, and the answers given were correct and systematic. So, researchers see an improvement, both in the learning process and learning outcomes.

CONCLUSION

Based on the results of classroom action research that has been carried out, it can be concluded that The application of the problem-based learning model can improve student learning outcomes in Class VII of SMP Negeri 8 Kei Besar on animal classification material. From the research results, there is an increase in class average scores and student learning completeness. In each cycle. The average value in cycle I was 62%, increasing in cycle II, namely 76%. Meanwhile, the percentage of completeness of learning outcomes in Cycle I was 27.2% and increased in Cycle II, namely 81.9%, so the level of completeness of student learning outcomes from Cycle I and Cycle II increased by 54.7%, so the desired target has been achieved for completeness of results; student learning, because at the end of the cycle they have reached the specified target, namely 70%.

REFERENCES

Ardiyanti, Y. (2016). Berpikir kritis siswa dalam pembelajaran berbasis masalah berbantuan kunci determinasi. *JPI (Jurnal Pendidikan Indonesia)*, *5*(2), 193-202.

Arifah, S. (2018). Strategi Pembelajaran Andragogi (Kajian pada Mata Kuliah Pembelajaran Bahasa Indonesia). *Al Iman: Jurnal Keislaman dan Kemasyarakatan*, *2*(1), 117-132.

Hanafy, M. S. (2014). Konsep belajar dan pembelajaran. *Lentera Pendidikan: Jurnal Ilmu Tarbiyah Dan Keguruan*, *17*(1), 66-79.

Ichsan, M. (2016). Psikologi pendidikan dan ilmu mengajar. *JURNAL EDUKASI: Jurnal Bimbingan Konseling*, *2*(1), 60-76.

Judijanto, L., Manu, C. M. A., Sitopu, J. W., Mangelep, N. O., & Hardiansyah, A. (2024). THE IMPACT OF MATHEMATICS IN SCIENCE AND TECHNOLOGY DEVELOPMENT. *International Journal of Teaching and Learning*, *2*(2), 451-458.

Kurniawan, D. A., Yennita, Y., & Idrus, I. (2017). Penerapan Model Pembelajaran Berbasis Masalah Untuk Meningkatkan Hasil Belajar IPA. *Diklabio: Jurnal Pendidikan dan Pembelajaran Biologi*, *1*(1), 22-27.

Mangelep, N. (2013). Pengembangan Soal Matematika Pada Kompetensi Proses Koneksi dan Refleksi PISA. *Jurnal Edukasi Matematika*, *4*(7), 451-466.

Mangelep, N. O. (2015). Pengembangan Soal Pemecahan Masalah Dengan Strategi Finding a Pattern. *Konferensi Nasional Pendidikan Matematika-VI,(KNPM6, Prosiding)*, 104-112.

Mangelep, N. O. (2017). Pengembangan perangkat pembelajaran matematika pada pokok bahasan lingkaran menggunakan pendekatan PMRI dan aplikasi geogebra. *Mosharafa*, *6*(2), 193-200.

Mangelep, N. O. (2017). Pengembangan Website Pembelajaran Matematika Realistik Untuk Siswa Sekolah Menengah Pertama. *Mosharafa: Jurnal Pendidikan Matematika*, *6*(3), 431-440.

Mangelep, N., Sulistyaningsih, M., & Sambuaga, T. (2020). Perancangan Pembelajaran Trigonometri Menggunakan Pendekatan Pendidikan Matematika Realistik Indonesia. *JSME (Jurnal Sains, Matematika & Edukasi)*, *8*(2), 127-132.

Mangelep, N. O., Tarusu, D. T., Ester, K., & Ngadiorejo, H. (2023). Local Instructional Theory: Social Arithmetic Learning Using The Context Of The Monopoly Game. *Journal of Education Research*, *4*(4), 1666-1677.

Mangelep, N. O., Tarusu, D. T., Ngadiorejo, H., Jafar, G. F., & Mandolang, E. (2023). OPTIMIZATION OF VISUAL-SPATIAL ABILITIES FOR PRIMARY SCHOOL TEACHERS THROUGH INDONESIAN REALISTIC MATHEMATICS EDUCATION WORKSHOP. *Community Development Journal: Jurnal Pengabdian Masyarakat*, *4*(4), 7289-7297.

Mangelep, N. O., Tiwow, D. N., Sulistyaningsih, M., Manurung, O., & Pinontoan, K. F. (2023). The Relationship Between Concept Understanding Ability And Problem-Solving Ability With Learning Outcomes In Algebraic Form. *Innovative: Journal Of Social Science Research*, *3*(4), 4322-4333.

Mangelep, N. O., Mahniar, A., Nurwijayanti, K., Yullah, A. S., & Lahunduitan, L. O. (2024). PENDEKATAN ANALISIS TERHADAP KESULITAN SISWA DALAM MENGHADAPI SOAL MATEMATIKA DENGAN PEMAHAMAN KONEKSI MATERI TRIGONOMETRI. *Jurnal Review Pendidikan dan Pengajaran (JRPP)*, *7*(2), 4358-4366.

Rahmadani, R. (2019). Metode Penerapan Model Pembelajaran Problem Based Learnig (Pbl). *Lantanida Journal*, *7*(1), 75-86.

Riwahyudin, A. (2015). Pengaruh sikap siswa dan minat belajar siswa terhadap hasil belajar IPA siswa kelas V sekolah dasar di Kabupaten Lamandau. *Jurnal pendidikan dasar*, *6*(1), 11-23.

Rukhayati, S. (2019). *Strategi Guru Pai dalam Mebina Karakter Peserta Didik SMK Al Falah Salatiga*. Lp2m Press Iain Salatiga.

Samura, A. O. (2019). Kemampuan berpikir kritis dan kreatif matematis melalui pembelajaran berbasis masalah. *MES: Journal of Mathematics Education and Science*, *5*(1), 20-28.

Suprihatin, S., & Manik, Y. M. (2020). Guru menginovasi bahan ajar sebagai langkah untuk meningkatkan hasil belajar siswa. *PROMOSI: Jurnal Program Studi Pendidikan Ekonomi*, *8*(1).

Surbakti, V. H. (2014). Penerapan Model Pembelajaran Berbasis Masalah (Pbm) Untuk Meningkatkan Hasil Belajar Biologi Siswa Kelas ViiiD smpn 6 Kota Bengkulu. *Bengkulu: UNIB. Tidak Dipublikasi*.

Suryadi, Ace. (2014). *Pendidikan Indonesia Menuju 2025*. Bandung: PT Remaja Rosdakarya.

Yazidi, A. (2014). Memahami Model-Model Pembelajaran Dalam Kurikulum 2013 (the Understanding of Model of Teaching in Curriculum 2013). *Jurnal Bahasa, Sastra, dan Pembelajarannya*, *4*(1), 89-95.

Zubaidah, S. (2020, November). Self Regulated Learning: Pembelajaran dan Tantangan pada Era Revolusi Industri 4.0. In *Prosiding SNPBS (Seminar Nasional Pendidikan Biologi dan Saintek)* (pp. 1-19).