Sunan Kalijaga International Journal on Islamic Educational Research (SKIJIER)
Vol. 7, No. 1, 2023, Page-47-56
DOI: https://doi.org/10.14421/skijier.2023.71.05

PROBLEM-BASED LEARNING MODEL FOR IMPROVING PROBLEM-SOLVING SKILLS AND CRITICAL THINKING OF ELEMENTARY SCHOOL STUDENTS

Rovika Meisya[1]
Universitas Islam Negeri Sunan Kalijaga Yogyakarta, Indonesia
22204085014@student.uin-suka.ac.id[1]

Raudhatul Jannah[2]
Universitas Islam Negeri Sunan Kalijaga Yogyakarta, Indonesia
22204085018@student.uin-suka.ac.id[2]

Debby Silvia Aqida[3]
Universitas Islam Negeri Sunan Kalijaga Yogyakarta, Indonesia
22204085003@student.uin-suka.ac.id[3]

Destia Khairunnisa[4]
Universitas Islam Negeri Sunan Kalijaga Yogyakarta, Indonesia
22204085019@student.uin-suka.ac.id[4]

Abstract: The teaching of science emphasizes that students should learn independently so that they can enhance their scientific attitude, thinking, working, and communication skills as life skills aspects. One of the fundamental problems found in education today is the low absorption capacity and critical thinking of students. One instructional model that can be used in science education is Problem-Based Learning (PBL). This research is conducted using a literature review method by analyzing previous studies on the improvement of learning outcomes and the critical thinking abilities of students through problem-based learning. The data sources for this research come from various previous research literature that has analyzed the use of problem-based learning models to enhance learning outcomes and the critical thinking abilities of students. Problem-based learning is intended, among other things, to help students develop thinking skills and problem-solving skills.

Keywords: Science Education, Problem-Based Learning, Critical Thinking

Received: 10-01-2023	Revised: 10-05-2023	Accepted: 17-06-2023

INTRODUCTION

Natural Science (IPA) education is one of the compulsory subjects studied at the Primary School/Madrasah Ibtidaiyah level. Science is a branch of knowledge that is related to the natural world. Science education in primary schools should be designed in such a way that learners can discover concepts from their learning that can be implemented in their daily lives. When this education is effectively structured, it will stimulate students to develop critical thinking skills.

One of the factors that can determine a person's success in life is having critical thinking skills. If someone possesses critical thinking skills, it becomes much easier for them to solve the challenges they encounter in their life. Critical thinking is one of the life skills that needs to be developed through the educational process[1]. The learning process in schools plays a role in helping students develop critical and creative thinking, especially when teachers who facilitate the process have the ability to guide learning that hones students' skills in these areas[2].

Science education emphasizes that students should learn independently in order to enhance their scientific attitude, thinking, working, and communication skills as life skills aspects. The thinking skills referred to are the students' ability to think critically by identifying problems, gathering and organizing necessary information, finding ways to solve these problems, understanding and using clear, unambiguous language, and drawing necessary conclusions and connections[3].

One of the fundamental problems found in education today is the low absorption capacity and critical thinking of students. During the learning process, students are rarely motivated to actively participate in their own learning. This lack of active involvement contributes to the current low level of critical thinking abilities among students. Another contributing factor is the conventional nature of the learning process[4]. Most classroom learning processes are directed towards memorizing and recalling information for students. Students are often compelled to memorize and remember information without being guided to understand concepts that they can apply in their daily lives. The consequence of this issue is that students may only grasp the theory without being able to apply it[5].

---

[1] Depdiknas, *Kurikulum Berbasis Kompetensi SLTP Pedoman Umum* (Jakarta: Direktorat Jenderal Pendidikan Dasar dan Menengah, 2002).

[2] Depdiknas, *Kurikulum Berbasis Kompetensi SLTP Pedoman Umum*.

[3] Rora Rizki Wandini et al., "Menerapkan Proses Keterampilan dalam Pembelajaran IPA di MI/SD" (n.d.).

[4] Trianto, *Model Pembelajaran Terpadu*, cet, VII. (Jakarta: Bumi Aksara, 2015).

[5] Lepinski, *Problem Based Learning: A New Approach To Teaching, Training & Developing Employees* (Cokie Lepinski, Assistant Communications Manager Marin County Sheriff's Office., 2005).

Teachers can make efforts to enhance children's critical thinking skills, one of which is through innovation in the teaching and learning process, such as using the appropriate teaching models. One instructional model that can be used in science education is the Problem-Based Learning (PBL) model, also known as the problem-based learning model. This instructional model is expected to improve the quality of science education[6].

The Problem-Based Learning model helps develop critical thinking skills, problem-solving abilities, and intellectual skills. It fosters teamwork, develops students' social attitudes, and encourages them to become autonomous learners. This instructional model involves students in self-directed exploration, enabling them to interpret the real world and construct an understanding of various phenomena[7].

The use of problems in the Problem-Based Learning model is drawn from real-world issues. Problems originate from authentic, everyday, and meaningful situations. The primary goal of PBL is to enhance the application of knowledge, problem-solving, and students' self-directed learning skills, requiring them to actively articulate, understand, and solve problems[8]. This model is also capable of enhancing problem-solving skills, coupled with the discovery of important concepts by the students[9].

From the issues explained above, this research will address how to improve student learning outcomes by implementing the Problem-Based Learning model, which will be analyzed based on relevant literature from previous studies.

This research is conducted using a literature review method by analyzing previous studies on the improvement of learning outcomes and the critical thinking abilities of students through problem-based learning. The data sources for this research come from various previous research literature that has analyzed the use of problem-based learning models to enhance learning outcomes and the critical thinking abilities of students[10].

---

[6] Sutria Amanda et al., "PENINGKATAN KEMAMPUAN BERPIKIR KRITIS SISWA PADA PEMBELAJARAN IPA MENGGUNAKAN MODEL PEMBELAJARAN BERBASIS MASALAH YANG BERBASIS SETS," *Natural Science Education Research* 1, no. 1 (September 10, 2018): 57–64.

[7] N Abbas, "Penerapan Model Pembelajaran Berdasarkan Masalah (Problem Based Instruction) Dalam Pembelajran Matematika Di SMU" (2000), http://www.depdiknas.go.id/jurnal.

[8] A B Susilo, "PENGEMBANGAN MODEL PEMBELAJARAN IPA BERBASIS MASALAH UNTUK MENINGKATKAN MOTIVASI BELAJAR DAN BERPIKIR KRITIS SISWA SMP" (2012).

[9] Susilo, "PENGEMBANGAN MODEL PEMBELAJARAN IPA BERBASIS MASALAH UNTUK MENINGKATKAN MOTIVASI BELAJAR DAN BERPIKIR KRITIS SISWA SMP."

[10] Andi Prastowo, *Metode Penelitian Kualitatif Dalam Perspektif Rancangan Penelitian* (Yogyakarta: ArRuzz Media, 2012).

DISCUSSION

Definition and Characteristics of Problem-Based Learning

Problem-Based Learning (PBL) is a problem-based instructional model. Fogarty (1997) defines PBL as a 'curriculum model designed around real-life problems that are ill-structured, open-ended, or ambiguous.' Meanwhile, Frinkle & Trop (1995), as stated in Teacher Pages, describe PBL as 'a curriculum development and instructional system that simultaneously develops both problem-solving strategies and disciplinary knowledge bases and skills by placing students in the active role of problem solvers confronted with an ill-structured problem that mirrors real-world problems.

Problem-Based Learning (PBL), often abbreviated as PBM, is an instructional method that challenges students to learn how to learn, collaborate in groups to seek solutions to real-world problems. Problem-Based Learning is a learning model based on numerous issues that require authentic investigation, meaning an investigation that necessitates real solutions to real problems. The characteristics of the problems to be solved are real issues related to innovative efforts or the application of technology in learning as part of professional responsibility and a commitment to the attainment of learning quality[11].

Setyosari It can be stated that problem-based learning is a method or instructional approach characterized by the presence of real-world problems as a context for students to learn critical thinking and problem-solving skills and acquire knowledge. Problem-based learning is an alternative and engaging instructional model in contrast to traditional classroom learning. In problem-based learning, the instructor presents students with a problem, not a lecture or assignment. As a result, students become more actively engaged in learning to discover and solve the problem[12].

From the definition above, we can understand that PBL has the following characteristics :

1. Based on complex and ill-structured real-world problems. The problems presented are relevant to what students face in their daily lives. The problems given serve as stimuli (motivators) to activate students in their learning..
2. The learning process is student-centered and provides experiential learning. The learning process stimulates students to conduct research, integrate

[11] I Wayan Gunada, Hairunnisyah Sahidu, and Sutrio Sutrio, "Pengembangan Perangkat Pembelajaran Fisika Berbasis Masalah untuk Meningkatkan Hasil Belajar dan Sikap Ilmiah Mahasiswa," *Jurnal Pendidikan Fisika dan Teknologi* 1, no. 1 (March 14, 2017): 38–46.

[12] Punaji Setyosari, *Belajar Berbasis Masalah (Problem Based Learning)* (Makalah disampaikan dalam Pelatihan Dosen-dosen PGSD FIP UNY di Malang, 2006).

theory, and apply the knowledge and skills they possess to provide solutions to the problems they face. Students will gain experience in how one works scientifically.

3. Specific context. Only information, facts, principles, procedures, or concepts related to the problem at hand will be sought and learned by the students.
4. Inductive. The subject matter is introduced through the process of solving a problem and not the other way around.
5. Recall of the lessons they have learned. This can be done if the current problem they are facing is related to the knowledge the students possess.
6. Collaborative and interdependent. Group-based PBL can help students develop teamwork skills[13].

Problem-based learning, its use in higher-order thinking, in problem-oriented situations, including how learning occurs. The problem-based learning model encompasses posing questions or problems, focusing on interdisciplinary connections, authentic inquiry, collaboration and producing work, and presentation. Problem-based learning is not designed to help teachers deliver as much information as possible to students[14].

In problem-based learning, the focus of learning is not solely on acquiring procedural knowledge. Consequently, assessment is not limited to tests alone. Assessment and evaluation aligned with the problem-based learning model involve evaluating the work produced by students as a result of their efforts and discussing the outcomes collaboratively. Process assessment can be used to evaluate students' work. The purpose of process assessment is for the teacher to observe how students plan to solve problems and how they demonstrate their knowledge and skills. Airasian[15] It is stated that performance assessment allows students to demonstrate what they can do in real-life situations.

Numerous studies have been conducted to determine the effectiveness of implementing PBL in science education. The research conducted by Dumgair and Rachmawati found that the implementation of Problem-Based Learning (PBL) in science subjects can enhance students' learning activities and outcomes.

[13] "Model Pembelajaran Berbasis Masalah (Problem Based Learning).Pdf," n.d.

[14] Hosnan, *Pendekatan Saintifik Dan Kontekstual Dalam Pembelajaran Abad 21* (Bogor: Ghalia Indonesia., 2014).

[15] Hosnan, *Pendekatan Saintifik Dan Kontekstual Dalam Pembelajaran Abad 21*.

Improvement in Learning Outcomes from the Application of Problem-Based Learning

The first study was conducted by[16] who researched the improvement of digital learning activities among students using the problem-based learning model in the science subject for Grade V students in Madrasah Ibtidaiyah. The results of Wardani's study indicated a significant increase in the learning activities of Grade V Madrasah Ibtidaiyah students.

Based on the results obtained in the first cycle, meeting 1, it can be seen that there were 8 active students, with a learning activity percentage of 26%. Then, in meeting 2, there was an increase in students' learning activity, with 13 active students, and a learning activity percentage of 43%. However, there are several indicators that have not been achieved, and the contributing factors include: 1) Students not following the rules related to the stages of learning because the researcher has not fully mastered classroom management. 2) The majority of participants relying on their group members to solve the problems provided by the researcher because some group members do not cooperate effectively. 3) Students being reluctant to ask questions because they have been represented by their group members, as they are still afraid and embarrassed to speak in front of the class[17].

The second study was conducted by Maryuningsih, who investigated the implementation of the problem-based learning model to enhance students' critical thinking skills in the subject of Science for Grade IV students in Islamic Elementary School. The results obtained from this research showed an improvement in learning outcomes, as evidenced by the increase in classical mastery of students' critical thinking skills in each cycle. In the first cycle, the percentage was 75%, and in the second cycle, it increased to 90%. The classical mastery of critical thinking skills exceeded the success indicator set at 85%, with students falling into the 'critical' and 'very critical' categories. Furthermore, the improvement can also be observed through the percentage of teacher activity in each cycle. In the first cycle, the teacher's activity percentage was 70%, which increased to 96% in the second cycle. As for student activity, it was 41% in the first cycle and increased to 76% in the second

[16] Gita Dwi Wardani, "Meningkatkan Aktivitas Belajar Digital Siswa Melalui Model Pembelajaran Berbasis Masalah Pada Mata Pelajaran IPA Kelas V MIN 15 Stabat T.A 2019/2020" (2020).

[17] Wardani, "Meningkatkan Aktivitas Belajar Digital Siswa Melalui Model Pembelajaran Berbasis Masalah Pada Mata Pelajaran IPA Kelas V MIN 15 Stabat T.A 2019/2020."

cycle. Both teacher and student activity percentages met the success indicators set for the study[18].

The next study was conducted by Ali, Syarifudin, dan Bakhtiar who investigated the Implementation of Problem-Based Learning Models to Enhance Science Learning Outcomes for 5th-grade students at the State Elementary School in Rimbo Panjang, Tambang District. The research results indicated that the implementation of the problem-based learning model can improve the science learning outcomes of 5th-grade students at the State Elementary School in Rimbo Panjang, Tambang District[19].

The improvements can be observed through the following factors[20]:

1. In the implementation of the problem-based learning model, the teacher's activity percentage in the first meeting of the first cycle was 70%, which increased to 75% in the second meeting, further increased to 85% in the first meeting of the second cycle, and reached 90% in the second meeting. In the third cycle, it started at 95% in the first meeting and maintained the same percentage in the final meeting.
2. The student activity percentage in the first meeting of the first cycle was 65%, which increased to 70% in the second meeting. In the first meeting of the second cycle, it increased to 75%, and in the second meeting, it remained at 85%. In the third cycle, the student activity percentage was 85%, and it increased to 90% in the final meeting.
3. The average student learning outcomes started at a baseline score of 59.19. It increased to 65.67 in the first cycle's assessment with a percentage increase of 10.94%. In the second cycle's assessment, the average score increased to 72.91 with a 10.90% improvement. In the third cycle, it further increased to an average of 77.81 with a 6.82% improvement. The classical mastery also improved, starting at an initial 41.39%, increasing by 19.36% in the first cycle to reach 61.29%, which is not considered fully mastered. In the second cycle, it increased by another 19.35% to reach 80.64%, falling

[18] Rizky Hasina Maryuningsih, "PENERAPAN MODEL PEMBELAJARAN BERBASIS MASALAH UNTUK MENINGKATKAN KEMAMPUAN BERPIKIR KRITIS PESERTA DIDIK PADA MATA PELAJARAN IPA DI KELAS IV MI AL AMIN PEJERUK TAHUN AJARAN 2019/2020" (2020).

[19] Damsir Ali, Muhamad Syarifudin, and Nurhasanah Bakhtiar, "Penerapan Model Pembelajaran Berbasis Masalah Untuk Meningkatkan Hasil Belajar IPA Siswa Kelas V SD Negeri 028 Rimbo Panjang Kecamatan Tambang," *Instructional Development Journal* 3, no. 1 (April 20, 2020): 1.

[20] Ali, Syarifudin, and Bakhtiar, "Penerapan Model Pembelajaran Berbasis Masalah Untuk Meningkatkan Hasil Belajar IPA Siswa Kelas V SD Negeri 028 Rimbo Panjang Kecamatan Tambang."

into t[21]he 'mastery' category. In the third cycle, there was an additional increase of 12.90%, reaching 93.54%.

The last study was conducted by Sambawarana which investigated the impact of the problem-based learning model on improving science learning outcomes for 3rd-grade elementary school students, showed that in the second cycle, the average student learning outcomes were 73, with a comprehension rate of 73%, and a learning mastery rate of 94%. These learning outcomes met the success indicators in the study. The success indicators in this research were an average of 70, a comprehension rate of 70%, and a learning mastery rate of 85%. The progress in the learning process in the second cycle was that the designed learning was successfully implemented by the students[22].

CONCLUSION

The problem-based learning model includes posing questions or problems, focusing on interdisciplinary connections, authentic inquiry, collaboration, and the creation and presentation of work. Problem-based learning is not designed to help teachers provide as much information as possible to students. Problem-based learning, among other things, aims to help students develop critical thinking skills and problem-solving skills. In problem-based learning, the focus of learning is not solely on acquiring procedural knowledge. Therefore, assessment is not limited to tests alone. Assessment and evaluation aligned with the problem-based learning model involve evaluating the work produced by students as a result of their efforts and discussing the outcomes collaboratively. Process assessment can be used to evaluate students' work.

References:

Abbas, N. "Penerapan Model Pembelajaran Berdasarkan Masalah (Problem Based Instruction) Dalam Pembelajran Matematika Di SMU" (2000). http://www.depdiknas.go.id/jurnal.

Ali, Damsir, Muhamad Syarifudin, and Nurhasanah Bakhtiar. "Penerapan Model Pembelajaran Berbasis Masalah Untuk Meningkatkan Hasil Belajar IPA Siswa Kelas V SD Negeri 028 Rimbo Panjang Kecamatan Tambang." *Instructional Development Journal* 3, no. 1 (April 20, 2020): 1.

[21] Gunada, Sahidu, and Sutrio, "Pengembangan Perangkat Pembelajaran Fisika Berbasis Masalah untuk Meningkatkan Hasil Belajar dan Sikap Ilmiah Mahasiswa."

[22] Anak Agung Ngurah Sambawarana, "Dampak Model Pembelajaran Berbasis Masalah untuk Meningkatkan Hasil Belajar IPA pada Siswa Kelas III Sekolah Dasar," *Journal of Education Action Research* 6, no. 2 (March 28, 2022): 269–276.

Al-Kailani, Jamal ad-Din Falih. *Min Ash-Shakk Ila al-Yaqin: Qira'ah Mutaanniyyah Fi Nasab Ash-Shaykh 'Abd al-Qadir al-Kailani: Bahth Naqdiyy Fi Masdar at-Tarih al-Islami al-Wasit*. Cairo: Dar az-Zanbiqah, 2014.

Al-Marāqī, Muslih. *An-Nūr Al-Burhāni Fi Tarjamah Al-Lujain Ad-Dānī Vol. 1*. Semarang: Toha Putera, 1962.

Amanda, Sutria, Laila Khamsatul Muharrami, Irsad Rosidi, and Mochammad Ahied. "PENINGKATAN KEMAMPUAN BERPIKIR KRITIS SISWA PADA PEMBELAJARAN IPA MENGGUNAKAN MODEL PEMBELAJARAN BERBASIS MASALAH YANG BERBASIS SETS." *Natural Science Education Research* 1, no. 1 (September 10, 2018): 57–64.

Chrstomy, Tommy. "The Babad Pamijahan: Sunda, Java and the Identity of the Pamijahanese." In *Signs of the Wali: Narratives at the Sacred Sites in Pamijahan, West Java*. Australia: ANU Press, 2008.

Depdiknas. *Kurikulum Berbasis Kompetensi SLTP Pedoman Umum*. Jakarta: Direktorat Jenderal Pendidikan Dasar dan Menengah, 2002.

Gunada, I Wayan, Hairunnisyah Sahidu, and Sutrio Sutrio. "Pengembangan Perangkat Pembelajaran Fisika Berbasis Masalah untuk Meningkatkan Hasil Belajar dan Sikap Ilmiah Mahasiswa." *Jurnal Pendidikan Fisika dan Teknologi* 1, no. 1 (March 14, 2017): 38–46.

Hasan, Aliah B Purwakania, and Eny Suwarni. "Policies and Practices for Promoting Multicultural Awareness of Indigenous Early Childhood Education in Indonesia." *International Journal of Child and Education Policy* 6, no. 1 (2012): 63–94.

Hosnan. *Pendekatan Saintifik Dan Kontekstual Dalam Pembelajaran Abad 21*. Bogor: Ghalia Indonesia., 2014.

Lepinski. *Problem Based Learning: A New Approach To Teaching, Training & Developing Employees*. Cokie Lepinski, Assistant Communications Manager Marin County Sheriff's Office., 2005.

Maryuningsih, Rizky Hasina. "PENERAPAN MODEL PEMBELAJARAN BERBASIS MASALAH UNTUK MENINGKATKAN KEMAMPUAN BERPIKIR KRITIS PESERTA DIDIK PADA MATA PELAJARAN IPA DI KELAS IV MI AL AMIN PEJERUK TAHUN AJARAN 2019/2020" (2020).

Munip, Abdul. "Uniqueness in Translating Arabic Hagiography of Shaikh 'Abd Al-Qādir Al-Jailānī: The Case of an-Nūr Al-Burhānī." *Indonesian Journal of Applied Linguistics* 7, no. 3 (2018): 668.

Prastowo, Andi. *Metode Penelitian Kualitatif Dalam Perspektif Rancangan Penelitian*. Yogyakarta: ArRuzz Media, 2012.

Sambawarana, Anak Agung Ngurah. "Dampak Model Pembelajaran Berbasis Masalah untuk Meningkatkan Hasil Belajar IPA pada Siswa Kelas III Sekolah

Dasar." *Journal of Education Action Research* 6, no. 2 (March 28, 2022): 269–276.

Setyosari, Punaji. *Belajar Berbasis Masalah (Problem Based Learning)*. Makalah disampaikan dalam Pelatihan Dosen-dosen PGSD FIP UNY di Malang, 2006.

Susilo, A B. "PENGEMBANGAN MODEL PEMBELAJARAN IPA BERBASIS MASALAH UNTUK MENINGKATKAN MOTIVASI BELAJAR DAN BERPIKIR KRITIS SISWA SMP" (2012).

Trianto. *Model Pembelajaran Terpadu*. Cet, VII. Jakarta: Bumi Aksara, 2015.

Wandini, Rora Rizki, Putri Zulva Sari, Noni Indah Rini, Sakinah Aprianni, and Anisyah Rahmadani. "Menerapkan Proses Keterampilan dalam Pembelajaran IPA di MI/SD" (n.d.).

Wardani, Gita Dwi. "Meningkatkan Aktivitas Belajar Digital Siswa Melalui Model Pembelajaran Berbasis Masalah Pada Mata Pelajaran IPA Kelas V MIN 15 Stabat T.A 2019/2020" (2020).

"Model Pembelajaran Berbasis Masalah (Problem Based Learning).Pdf," n.d.