

Mapping Research on Problem Based Learning (PBL) in Elementary School Science Learning: A Systematic Analysis of Focus, Methods, and Development Opportunities

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ABSTRACT

The PBL learning model in science lessons is a solution to improve critical thinking skills, learning motivation, and improve student learning outcomes in the current era. This study aims to provide in-depth information about the research of the PBL model in science learning in elementary schools, especially on the research method, focus of the study, and the theme of the study. The method used is SLR (systematic literature review). Data collection was carried out by documentation and reviewing articles about the PBL learning model in science lessons in the period 2020-2025. The data were collected from 40 articles in Google Scholar and Sinta. The results of the study show that the Based Learning learning model uses various methods, namely qualitative, quantitative, mixed methods, and research and development. The most popular method is qualitative while the least popular method is research and development. This study examines the focus of problems grouped into three, namely the impact on learning outcomes, student motivation, and student critical thinking. The results of this study indicate that most research studies on the PBL model focus on the impact on student learning outcomes, while the fewest studies discuss the impact of the PBL model on student motivation.

Say Key : Problem based learning, science, learning outcomes, student motivation, student critical thinking.

INTRODUCTION

Science understanding is very much needed as a scientific basis in dealing with problems that occur in society Today , science learning equips students with the skills to observe, analyze, and solve problems using scientific methods. Science learning focuses not only on cognitive aspects but also develops scientific skills and attitudes in dealing with natural and social phenomena. The world of education prepares a generation that is adaptive to technological advances and social complexity. One of the student's abilities is that is critical thinking is student skills that must be owned in facing the era of globalization .

However , in today's era it can seen very much sad Instead of improving critical thinking skills , many students struggle to understand science concepts and materials. This is due to teacher dominance in learning. Teachers tend to focus on the lesson, denying students the opportunity to explore or actively participate. The use of less interactive media is also a contributing factor. The limited availability of interactive media makes it difficult for students to explore and understand science concepts. Furthermore, the methods teachers use are often

less varied and often monotonous, leaving students unmotivated and inclined to memorize material without a deep understanding of concepts ¹.

Science learning is essentially designed to foster curiosity about the environment, foster social awareness of nature and resources, and foster critical thinking and problem-solving skills in the real world. With an appropriate learning approach, students are expected to understand social change in society, recognize their role as part of a community, and contribute positively to community life. Science learning in the current era faces serious challenges, particularly in critical thinking, with learning outcomes and student motivation tending to be low. This necessitates the development of learning media in schools. which is in accordance with the characteristics of the material and the characteristics from Students and alternative learning resources should be utilized optimally. Failure to do so can result in learning becoming less engaging and irrelevant to the current era.

The need for learning in facing this situation requires teachers to innovate by adopting interactive and contextual learning models ². The goal For foster curiosity , develop thinking skills , and solving problems in learning . See the many obstacles faced in learning , an effective approach in science learning for increasing motivation, student learning outcomes and critical thinking is the PBL model . The PBL model is solution for students where there are many problems that are relevant to life , so that with use This method encourages them to think critically, investigate , solve problems. as well as Solve problems independently . Therefore , applying the PBL model to elementary school learning is the first step in designing effective and enjoyable learning ³.

The application of the PBL model makes student think independently and critically in finding the problems faced. Not not only improve learning outcomes but also become a guide for educators in designing Science learning . The PBL model improves both independent and collaborative learning skills ⁴. The PBL learning approach is student-centered and highly relevant to implement, resulting in a better understanding of the material in science learning. PBL learning presents a challenge for students to explore information, analyze something, and produce meaningful knowledge. The PBL model emphasizes the application of complex, open, and close learning situations in real life ⁵.

With various studies to evaluate the effectiveness of PPL with various qualitative, quantitative, text, method, and R&D approaches with the aim of creating a meaningful science learning process for students. There has not been a comprehensive study that describes broadly the various research that discusses the application of science learning focused on increasing

¹ Eka Anisa Aprina , Erma Fatmawati, and Andi Suhardi, " Application of Problem Based Learning Model for Develop Skills Critical Thinking in Elementary School Science Content ," *Didaktika : Journal Education* 13, no. 1 (2024): 981–90.

² I Nyoman Sita Setiawan, Ketut Suma, and I Wayan Suastra , " Learning Model Based Problem Increase Motivation and Learning Outcomes of Students in Science Elementary School ," *Journal Teacher Professional Education Science* 3, no. 1 (2024): 173–82, <https://doi.org/10.46306/jurinotep.v3i1.84>.

³ Eva Sagita, Vivi Amalia, and Non Dwishiera CA, " Literature Study : Problem Based Learning Model in Science Learning in Elementary Schools ," *Journal of Elementary School Teacher Education* 1, no. 2 (2023): 14, <https://doi.org/10.47134/pgsd.v1i2.242>.

⁴ Jihan Rafiadilla, " Research on PBL Learning Models in Elementary Schools: Systematic Literature Review," *National Seminar on Elementary Education* 10 (2024): 89–96.

⁵ Nur Afni, " Implementation of the Problem Based Learning (PBL) Model at Nur Elementary School," *Innovation Workshop Learning In Primary Schools SHEs: Conference Series* 3 (4) (2020) 1000–1004 *Implementation* 3, no. 4 (2020): 1000–1004.

motivation, critical thinking, and improving learning outcomes. The aim of this researcher is to provide a comprehensive overview of literature studies on the impact of PBL implementation in science learning in Indonesia. By revealing various contexts of PBL implementation, both from the impact of increasing motivation, learning outcomes, and improving critical thinking skills, this research is expected to be able to identify gaps that have not been touched by previous researchers.

RESEARCH METHOD

Systematic Literature Review (SLR) method with referring to the guidelines prism For ensure Transparency . The selection process was carried out in stages, namely by screening the title and abstract , and reviewing the complete text, then visualizing it in a prism diagram . From the extracted data, including identity , method , subject , study focus , instrument , results , and limitations , it was then analyzed descriptively to see publication trends and analyzed thematically to group the results of the study. The standard of transparency was maintained by reporting such as selection criteria , stages of analysis , and quality assessment of articles based on the clarity of the method , validity , and relevance of the research ⁶.

The data that was taken from The articles reviewed in this study were taken from two sources, namely Google Scholar and Sinta (science and technology index). Google Scholar and Sinta were chosen because these two databases are reputable national journal indexes in Indonesia, so they have gone through a strict editing process. Meanwhile, Google Scholar was chosen because it provides broad access to scientific publications from various countries, including international journals that are relevant to this study. Therefore, Google Scholar and Sinta were chosen because of their credibility and accessibility, as well as their valid literature and relevance to the topic of problem-based learning in science in elementary schools ⁷.

From the search results, the researcher obtained 48 articles that matched the theme. 38 were published articles in national journals indexed by Sinta. The other 10 were national journals in English. The retrieval was carried out through Google Scholar, then all articles were grouped based on the study's focus, namely the impact of PBL on motivation, learning outcomes, and critical thinking . The data obtained were then analyzed descriptively and thematically to identify research focus methods and research areas that have not yet been explored. This study is expected to provide a comprehensive view of PBL and become a basis for future research and learning practices ⁸.

RESULTS AND DISCUSSION

Here are 40 articles related to PBL in science learning that has been done published in 2020 to 2025.

Table 1. Articles on PBL research results *in science learning*

Researcher, Year	Journal	Method	Research Focus
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⁶ Dewi Pertiwi Aghel, " Literature Study Regarding Learning Outcomes Science Using the PBL (Problem Based Learning) Model for Elementary School Students ," *Jurnal School* VIII, no. I (2023): 1–19.

⁷ Rafiadilla , " Research on PBL Learning Models in Elementary Schools: Systematic Literature Review."

⁸ Aghel, " Literature Review Regarding Learning Outcomes Science Using the PBL (Problem Based Learning) Model for Elementary School Students ."

Mu'tiqoh Izzatun Nadiyah, et.al, 2022 ⁹	Dharmas Education Journal, 2022	Library research, qualitative	Learning model PBL in student learning outcomes in elementary schools/Islamic elementary schools
Eka Anisa Aprina, et.al, 2024 ¹⁰	Journal of Education: Didactic, 2024	Literature study, qualitative method	The PBL learning model can improve students' critical thinking skills in science lessons.
Aisyah Nofziarni, et.al, 2024 ¹¹	Basicedu Journal, 2024	Quantitative research, quasi-experimental method	learning model in learning outcomes
Misbah Binasdevi, 2022 ¹²	Indonesian Journal of Islamic Elementary Education, 2022	Quantitative research, quasi-experimental method	The influence of environmentally oriented PBL and students' critical thinking
Ima Islahul, et.al, 2023 ¹³	Papanda Journal of Mathematics and Sciences Research	Literature study, qualitative method	The influence of PBL on students' creative thinking in science learning
Harini Mukhtar, 2022 ¹⁴	Journal (IICLS), 2022	Class action research, Mix method.	Analyzing the effectiveness of PBL in learning outcomes of fourth grade students' learning styles at MI
Ayu Ansor Karimah, et.al, 2023 ¹⁵	Scientific Journal of Elementary School Teacher Education : Pedadiktika	Collaborative Classroom Action Research (CAR), qualitative approach	The implementation of PBL increases students' learning motivation in science lessons in grade IV of elementary school.

⁹ Mu'tiqoh Izzatun Nadiyah et al., " Implementation of Problem Based Learning in Science Learning in Class V MI / SD," *DE_JOURNAL (Dharmas Education Journal)* 3, no. 2 (2022): 220–27.

¹⁰ Eka Anisa Aprina , Erma Fatmawati, and Andi Suhardi, " Application of Problem Based Learning Model for Develop Skills Critical Thinking in Elementary School Science Content ," *Didaktika : Journal Education* 13, no. 1 (2024): 981–90.

¹¹ Aisyah Nofziarni, Yanti Fitria, and Alwen Bentri, " The Influence of The Use of Problem Based Learning (PBL) Models on Learning Outcomes Student In Elementary School," *BASICEDU JOURNAL Research & Learning in Elementary Education* 3, no. 4 (2024): 2016–24.

¹² Misbah Binasdevi, " The Influence of Problem Based Learning Model Oriented Literacy Environment To Skills Critical Thinking of Elementary Madrasah Students," *Indonesian Journal of Islamic Elementary Education* 2 (2022): 81–90.

¹³ Ima Islahul ' Adiilah and Yuyun Dwi Haryanti, " The Influence of the Problem Based Learning Model on Ability Think Student Creativity in Science Learning ," *Papanda Journal of Mathematics and Science Research* 2, no. 1 (2023): 49–56, <https://doi.org/10.56916/pjmsr.v2i1.306>.

¹⁴ Harini Mukhtar, " Analysis of the Problem Based Learning (PBL) Model Can Improve Science Learning Outcomes on Force Material in Students" Class IV MI Negeri 2 Kerinci ," *Jurnal Edu Research Indonesian Institute For Corporate Learning And Studies (IICLS)* 3, no. 1 (2022): 21–32.

¹⁵ Ayu Ansor Karimah, Enung Siti Nurfarijah, and Darmawan, " Application of Problem Based Learning (PBL) Model for Increase Motivation Study Students in the Science Subject in Grade IV of Elementary School ," *Pedagogical : Journal Elementary School Teacher Education Science* 10, no. 3 (2023): 404–13.

Yanuar Meta Ratnasari, et.al, 2021 ¹⁶	Pinisi Journal PGSD	Qualitative Research, with (classroom Action research)	Improving PBL on the quality of learning outcomes in class II students of SD Negeri 1 Bendoharjo
Hermawan Lupik, et.al, 2025 ¹⁷	Journal of Education and Teaching Cendikia, 2025	Quasi-experimental, quantitative	Evaluating the effectiveness of PBL for fifth grade students at Tegallega State Elementary School
Mia Cindy Claudia Sianturi, et.al, 2022 ¹⁸	Indonesian Journal of Community Service Research Development (P3JI), 2022	Quantitative research, pre-experimental design method	the PBL model on critical thinking of fifth grade elementary school students in science subjects
Nur Auliah, et.al, 2023 ¹⁹	Journal of Pedagogical and Pedagogical Innovation (JIPTEK), 2023	qualitative, descriptive, type of PTK research (Classroom Action Research)	Increasing learning motivation by implementing PBL for fifth grade students at SDN 53 Makkaraeng, Maros
Hesti Ratna Sari, et.al, 2022 ²⁰	Journal of Pendas, 2022	Qualitative Approach, Field research	Improving PBL in Learning Motivation in Grade IV of Tukangan State Elementary School, Yogyakarta
Rafiq Nur Fadillah, et.al, 2024 ²¹	Joyful Learning Journal, 2024	Quantitative approach with all experimental/quasi-experimental methods	The influence of PBL on the critical thinking skills of fifth grade students at Margajaya State Elementary School

¹⁶ Yanuar Meta Ratnasari , Rahmawati Patta, and Juliadi , “ Improvement Quality Learning Through Implementation of Problem Based Learning (PBL) Model for Students Grade II Elementary School,” *Pinisi Journal PGSD* 1, no. 2 (2021): 418–25.

¹⁷ Hermawan Lupik, Iis Nurasiah , and Irna Khaleda Nurmeta, " On the Results of Science Learning for Grade V at Tegallega State Elementary School ," *Cendikia Journal of Education and Teaching* 3, no. 1 (2025): 454–63.

¹⁸ MIA CINDY CLAUDIA SIANTURI, ASSISTANT FERNANDO SIAGIAN, and EVA PASARIBU, " The Effect of Problem Based Learning Model on Ability Critical Thinking of Fifth Grade Elementary School Students in Science Subjects,” *Pedagogika* 2, no. 3 (2022): 163–83, <https://doi.org/10.37411/pedagogika.v13i2.1354>.

¹⁹ Nur Aliah, Khaerunnisa , and Sayidiman , “ Implementation of the PBL Model For Increase Motivation Study Science Student Class VB Sdn 53 Makkaraeng Maros Regency ,” *Journal Innovation Pedagogy and Technology (JIPTEK)* 1, no. 1 (2023): 86.

²⁰ Hesti Ratna Sari et al., “ Improvement Motivation Study Students in Science Learning With Using the Problem Based Learning Model for Grade IV Students of Tukangan Elementary School , Yogyakarta,” *Pendas: Journal Elementary Education Science* 09, no. 03 (2022): 114–19.

²¹ Rafiq Nur Fadillah et al., " The Influence of the Problem Based Learning Model on Ability Critical Thinking in Science Learning for Fifth Grade Students in Public Elementary Schools,” *Joyful Learning Journal* 14, no. 1 (2024): 1–23.

Ita Rosiana, et.al, 2024 ²²	Journal of Intellectuals and Scholars, 2024	Quantitative Approach, with Quasi Experiment	The influence of PBL in learning video media on critical thinking skills in science lessons for grade V at MI Ma'arif Kalijeruk, Garung District in 2023/2024
Ade Dian Silvia, Fenny Roshayanti, and Ngurah Ayu Nyoman M , 2024 ²³	Didactic Journal, 2023	Quantitative research, experimental methods	To determine the influence of PBL on the learning outcomes of science students in grade IV of Gayamasari Elementary School
Rizkika Windasari, Ahmad Harjono, and Fitri Puji Astria, 2024 ²⁴	Scientific Journal of Educational Profession, 2024	Quasi-experimental, quantitative method	The influence of PBL on science learning outcomes in grade IV of SD Negeri 2 Anggaraksa
La Tansa Michelia Champaka HN and Muhammad Suwignyo Prayogo, 2024 ²⁵	At Ta'lim: Journal of Elementary Schools, 2024	Qualitative, Field research	Implementation of PBL in ecosystem material in training critical thinking skills at MI Miftahul Ulum 02
Fitri Amelia Rosida and Duwi Nuvitalia, 2024 ²⁶	Innovative Journal, 2024	Qualitative approach, Field research	PBL analysis in critical thinking skills of students at SDN Gayamsari 02 Semarang
Ari Kusmiati Ningsih, Nasution, and Dian Permatasari Kusuma Dayu, 2024 ²⁷	Journal of Educational Sciences	Quantitative research, quasi-experimental	Analyzing the effectiveness of PBL on the learning outcomes of 5th grade elementary school students on the material My Indonesia is Rich
Nasaruddin, Syamsuryani Eka Putri Atjo, and Ayu Tiara, 2023 ²⁸	Journal of Educational Metaphors	Quantitative methods, descriptive statistical approach	The influence of PBL on science learning outcomes of grade V at SD 032 Inpres Pambusuang.

²² Ita Rosiana , Ahmad Khoiri, and Bambang Sugiyanto , " The Effect of Problem Based Learning Model Assisted by Learning Videos To Ability Critical Thinking of Students in Science Subjects of Grade V at MI Ma ' Arif Kalijeruk Subdistrict Garung Academic Year 2023/2024," *Journal Intellectuals and Scholars of the Archipelago* 1, no. 3 (2024): 3905–9.

²³ Ade Dian Silvia, Fenny Roshayanti, and Ngurah Ayu Nyoman M, " The Effect of Problem Based Learning Model on Students' Science Learning Outcomes " Grade IV of Gayamsari 02 State Elementary School," *Didactics : Journal Scientific PGSD STKIP Subang* 9, no. 2 (2023): 4362–70, <https://doi.org/10.36989/didactic.v9i2.1106>.

²⁴ Rizkika Windasari, Ahmad Harjono, and Fitri Puji Astria, " The Effect of Problem Based Learning Model on Science Learning Outcomes ," *Journal Scientific Profession Education* 4, no. 1 (2024): 113–20, <https://doi.org/10.54371/jiepp.v4i1.370>.

²⁵ La Tansa Michelia Champaka HN and Muhammad Suwignyo Prayogo, " Implementation of Learning Models Based Problem-Based Learning (PBL) in Science Learning Ecosystem Material at MI Miftahul Ulum 02 Ajung Jember," *AT TA'LIM: Journal of Elementary School* 3, no. 2 (2024).

²⁶ Fitri Amelia Rosida and Duwi Nuvitalia , " Analysis of the Problem Based Learning Model Against Ability Critical Thinking in Science Learning for Grade IV SDN Gayamsari 02 Semarang," *INNOVATIVE: Journal Of Social Science Research* 9, no. 1 (2024): 18–27, <https://doi.org/10.29303/jipp.v9i1.1992>.

²⁷ Ari Kusmiati Ningsih, Nasution, and Dian Permatasari Kusuma Dayu, " The Effect of Problem Based Learning Model on Science Learning Outcomes for Grade 5 Elementary School Students on the Material of My Rich Indonesia ," *Journal Educational Sciences* 7, no. 4 (2024): 161–69.

²⁸ Nasaruddin , Syamsuryani Eka Putri Atjo , and Ayu Tiara, " The Effect of Problem Based Learning (PBL) Model on Science Learning Outcomes of Fifth Grade Students at SDN 032 Inpres" Pambusuang Regency Polewali Mandar," *JOURNAL OF EDUCATIONAL METAPHOR* 1, no. 2 (2023): 143–57.

Yusuf Rambe, Khaeruddin, and Ma'ruf, 2024 ²⁹	Journal of Research and Innovation in Teaching	Quantitative research, quasi-experimental	The influence of PBL on critical thinking and science learning outcomes
Khoirun Nisa, Muis Sad Iman, and Irham Nugroho, 2024 ³⁰	El-Ibtidaiy: Journal of Primary Education	Mixed method, classroom action research	Improving learning research outcomes in the PBL model in MI
Wahyuddin Anfal, I Made Citra Wibawa, and I Gede Margunayasa, 2025 ³¹	JagoMIPA: Journal of Mathematics and Science Education, 2025	Quasi-experimental, quantitative research	The influence of PBL on motivation and science learning achievement of fifth grade students at SDN 2 Tente
Muhammad Arifin et al., 2024 ³²	Journal of Education Research	Quantitative research, Classroom Action Research (CAR)	Improving motivation and learning outcomes in science lessons with PBL
I Kadek Agus Septi Artawan, Ni Wayan Rati, and Desak Putu Pajarastuti, 2021 ³³	JIPG, 2021	Quantitative, Classroom Action Research (CAR)	Implementation of the PBL model in improving science learning outcomes for elementary school students
Selvia Dinda R and Setyo Eko Atmojo, 2024 ³⁴	Lensa Journal, 2024	Quantitative, Quasi Experimental	The effectiveness of PBL in improving problem solving and increasing motivation in SDN 1 Padokan science lessons
Aghel, 2023 ³⁵	School Journal, 2023	Qualitative Research, Literature review	The effectiveness of PBL in elementary school science learning outcomes

²⁹ Yusuf Rambe, Khaeruddin , and Ma'ruf , " The Influence of the Problem Based Learning Model on Ability Critical Thinking and Science Learning Outcomes in Elementary School Students ,” *Journal of Learning Research and Innovation* 4, no. 1 (2024): 341–55, <https://doi.org/10.51574/jrip.v4i1.1372>.

³⁰ Khoirun Nisa, Muis Sad Iman, and Irham Nugroho, " Improving Science Learning Outcomes Through Implementation of Problem Based Learning Model in Elementary Madrasah,” *Hamzanwadi Journal of Science Education* 1, no. 1 (2024): 45–52, <https://doi.org/10.29408/hijase.v1i1.25669>.

³¹ Wahyuddin Anfal, I Made Citra Wibawa, and I Gede Margunayasa , “ Description The Influence of the Problem Based Learning Model on Motivation and Achievement of Students’ Science Learning Class V,” *Journal of Mathematics and Science Education* 5, no. 1 (2025): 315–23.

³² Muhammad Arifin et al., " Application of PBL Model in Science Learning for Increase Motivation and Student Learning Outcomes,” *Journal of Education Research* 5, no. 4 (2024): 6109–21.

³³ I Kadek Agus Septi Artawan, Ni Wayan Rati, and Desak Putu Pajarastuti, " Implementation of the Problem Based Learning Model for Improving Students’ Science Learning Outcomes Elementary School ,” *Journal Journal of Teacher Professional Education* 4, no. 2 (2021): 173–81, <https://doi.org/10.23887/jippg.v4i2.35582>.

³⁴ Selvia Dinda R and Setyo Eko Atmojo, " The Effectiveness of the Problem Based Learning (PBL) Model on Ability Problem Solving and Student Motivation in Science Learning in Grade V of SD Negeri 1 Padokan ,” *LENSA (Lentera Sains): Journal of Science Education* 14, no. 1 (2024): 48–57, <https://doi.org/10.24929/lensa.v14i1.399>.

³⁵ Aghel, “ Literature Review Regarding Learning Outcomes Science Using the PBL (Problem Based Learning) Model for Elementary School Students .”

Setiawan, Suma, and Suastra, 2024 ³⁶	Journal of Teacher Professional Education, 2024.	Quasi-experimental, quantitative method	Analyzing the differences between motivation and learning outcomes in the PBL model
Agnes Renostini Harefa and Desman Telaumbanua, 2024 ³⁷	JiIP: Scientific Journal of Educational Sciences, 2024	Qualitative, library research approach	PBL learning model in increasing students' motivation and interest in learning science
Elfrida Gupita Eka Cipta, Muh Wahdan, and Dinar Westri Andini, 2024 ³⁸	Proceedings of the National Seminar on Teacher Professional Education, 2024	Qualitative, PTK (Classroom Action Research) research	Increasing motivation to learn science with the PBL <i>model</i> based on Wordwall media in class V of SDN Gunting
Triyanti et al. 2021 ³⁹	Journal of Social Science and Humanities, 2021	Research and Development (R&D) approach	PBL -based teaching materials in improving learning outcomes
Samsul Susilawati and Triyo Supriyatno, 2023 ⁴⁰	Advances in Mobile Learning Education Research	Mixed Method, PTK research	Analyzing the effectiveness of the PBL model in improving critical thinking skills
Ria Safitri, Sopiyan Hadi, and Widiasih, 2023 ⁴¹	Journal of Science Education, 2023.	Quantitative, quasi-experimental type	To determine the influence of the PBL model on learning motivation and learning outcomes
Arga Pratama and Novi Setyasto, 2024 ⁴²	Journal of Science Education Research, 2024	Research & development methods	PBL -based Prezi media to improve science learning outcomes for grade IV

³⁶ Setiawan, Suma, and Suastra , “ Learning Model Based Problem Increase Motivation and Learning Outcomes of Students in Science Elementary school .”

³⁷ Agnes Renostini Harefa and Desman Telaumbanua , “ Improving Motivation and Interest in Learning Science Through Learning Based Problem : An Analytical Study ,” *JiIP - Journal Scientific Educational Sciences* 7, no. 8 (2024): 9045–51, <https://doi.org/10.54371/jiip.v7i8.5283>.

³⁸ Elfrida Gupita Eka Cipta, Muh Wahdan, and Dinar Westri Andini, "Efforts to Improve Motivation Learning in Science Learning with Problem Based Learning Model Based on Wordwall Media ,” *Proceedings of the National Seminar on Teacher Professional Education, Sarjanawiyata University Tamansiswa* 3, no. 1 (2024).

³⁹ Triyanti et al., "Problem Based Technology and Science Development to Improve Science Learning Outcomes in Elementary Schools," *ANP Journal of Social Sciences and Humanities* 2, no. 2 (2021): 151–56, <https://doi.org/10.53797/anp.jssh.v2i2.21.2021>.

⁴⁰ Samsul Susilawati and Triyo Supriyatno , "Problem-Based Learning Model in Improving Critical Thinking Ability of Elementary School Students," *Advances in Mobile Learning Educational Research* 3, no. 1 (2023): 638–47, <https://doi.org/10.25082/amler.2023.01.013>.

⁴¹ Ria Safitri, Sopiyan Hadi, and Widiasih , "Effect of the Problem Based Learning Model on the Students Motivation and Learning Outcomes," *Journal Science Education Research* 9, no. 9 (2023): 7310–16, <https://doi.org/10.29303/jppipa.v9i9.4772>.

⁴² Arga Pratama and Novi Setyasto , *Development of Prezi Media Based on Problem-Based Learning (PBL) Model in Natural and Social Science Subjects in Class IV Elementary School* , 10, no. 11 (2024), <https://doi.org/10.29303/jppipa.v10i11.9473>.

Siti Rosnawati, Siti Mayang Sari, and Lili Kasmini, 2024 ⁴³	Bantara Elementary Education Journal, 2024	Field research, qualitative	Utilization of science video media using the PBL model to improve critical thinking of fifth grade students at SDN 7 Linge, Banda Aceh
Dela Fitri Puspita Sari, Zainnur Wijayanto, and Leritara, 2024 ⁴⁴	ICSTI Journal;, 2024	Mixed Method, PTK (Classroom Action Research) research	Increasing science learning motivation in PBL
Rifqi Festiawan et al., 2021 ⁴⁵	Journal Sport Area, 2021	Quantitative methods, true experimental research	PBL model on critical thinking and student motivation
Ratih Syalaisyah Az Zahra and Desi Wulandari, 2025 ⁴⁶	Journal of Science Education Research, 2025	Research & development methods	Development of PBL-based Happy Notes learning media to improve students' learning outcomes in science subjects
Yuyun Dwi Haryanti et al., 2022 ⁴⁷	Al Ibtida Journal:, 2022	Quantity t if, quasi experiment	Improving critical thinking skills of elementary school students through the PBL model
Chandra Anugrah Putra and Dina Dwi Lestari, 2024 ⁴⁸	Tunas Journal, 2024	Quantitative , PTK (Classroom Action Research) research	The application of the PBL model supported by audio-visual media to improve science learning outcomes in Selat Hulu Elementary School students.

Based on Table 1, it can be analyzed that there are 40 articles with various methods. All 40 studies used qualitative, quantitative , and mixed methods. However, the number of methods used in these 40 journals varies.

Table 2. Research articles on Problem Based Learning (PBL) in science learning

⁴³ Siti Rosnawati, Siti Mayang Sari, and Lili Kasmini, "Utilization of Science Learning Videos Through the Problem Based Learning (Pbl) Model in Critical Thinking Skills of Grade V Students of State Elementary School 7 Linge Banda Aceh," *Journal Primary Education Bantara* 7, no. 2 (2024): 146–57, <https://doi.org/10.32585/dikdasbantara.v7i2.4927>.

⁴⁴ Dela Fitri Puspita Sari, Zainnur Wijayanto , and Leritara , "INCREASING STUDENT LEARNING MOTIVATION IN IPAS SUBJECT THROUGH PROBLEM BASED LEARNING MODEL," *ICSTI: International Conference on Science and Technology for The Internet Of* , no. 20 (2024).

⁴⁵ Rifqi Festiawan et al., "The Problem-Based Learning: How the Effect on Student Critical Thinking Ability and Learning Motivation in COVID-19 Pandemic?, " *Journal Sport Area* 6, no. 2 (2021): 231–43, [https://doi.org/10.25299/sportarea.2021.vol6\(2\).6393](https://doi.org/10.25299/sportarea.2021.vol6(2).6393).

⁴⁶ Ratih Syalaisyah Az Zahra and Desi Wulandari, "Development of Happy Notes PERUGI Learning Media (Energy Transformation) Based on Problem Based Learning to Improve Student Learning Outcomes in Natural and Social Science Subjects in Grade IV of Elementary School," *Journal Science Education Research* 11, no. 3 (2025): 954–69, <https://doi.org/10.29303/jppipa.v11i3.10992>.

⁴⁷ Yuyun Dwi Haryanti et al., "Improving the Critical Thinking Skills of Elementary School Students through Problem Based Learning and Inquiry Models in Social Science Learning," *Al Ibtida: MI Teacher Education Journal* 9, no. 2 (2022): 292, <https://doi.org/10.24235/al.ibtida.snj.v9i2.10485>.

⁴⁸ Chandra Anugrah Putra and Dina Dwi Lestari, *The Application of Problem Based Learning Model Assisted by Audio-Visual Media to Improve Social Science Outcomes in 4th Grade 5 Selat Hulu Elementary School* , 10, no. 1 (2024): 65–70, <https://doi.org/10.33084/tunas.v10i1.9070>.

Qualitative		Quantitative		Mix Method	Research and Development (R&D) approach	
Design		Design		Design	J	
Field research	4	quasi-experiment	15	Classroom Action Research	4	3
Library research	2	Pre-experimental design	1			
Literature review	3	descriptive statistics	1			
PTK	4	PTK	3			
Amount	13		20		4	3

Based on Table 2, it can be seen that quantitative research methods are the favorite in PBL studies of science lessons with a total of 20 articles. In addition to quantitative methods, this study also observed articles using qualitative methods with a total of 13. Furthermore, the mixed-method method was also used in 4 articles and finally the research & development method in 3 articles.

Looking further at table number 2 the use of the quantitative research method is widely used because it produces statistical data, tests hypotheses, and ensures validity and reliability in research results. The quantitative research method is divided into 4 designs, namely quasi-experimental, Pre-experimental design, descriptive statistics, classroom action research. Among the 4 designs most studied by researchers is the quasi-experimental, there are 15 articles, namely Nofziarni⁵⁰, Binasdevi⁵¹, Lupik⁵², Fadillah⁵³, Rosiana⁵⁴, Ade Dian Silvia

⁴⁹ Binasdevi, "The Influence of Problem Based Learning Model Oriented Literacy Environment To Skills Critical Thinking of Elementary School Students."

⁵⁰ Nofziarni, Fitria, and Bentri, "The Influence The Use of Problem Based Learning (PBL) Models on Learning Outcomes Student In Elementary School."

⁵¹ Binasdevi, "The Influence of Problem Based Learning Model Oriented Literacy Environment To Skills Critical Thinking of Elementary School Students."

⁵² Lupik, Nurasiah, and Nurmeta, "On the Outcomes of Science Learning for Grade V at Tegalle State Elementary School."

⁵³ Fadillah et al., "The Influence of the Problem Based Learning Model on Ability Critical Thinking in Science Learning for Fifth Grade Students at Public Elementary Schools."

⁵⁴ Rosiana, Khoiri, and Sugiyanto, "The Effect of Problem Based Learning Model Assisted by Learning Videos To Ability Critical Thinking of Students in Science Subjects of Grade V at MI Ma' Arif Kali Jeruk Subdistrict Garung Academic Year 2023 / 2024."

⁵⁵, Windasari ⁵⁶, Ningsih ⁵⁷, Rambe ⁵⁸, Anfal ⁵⁹, Atmojo ⁶⁰, Setiawan ⁶¹, Susilawati ⁶², Sari ⁶³, Haryanti ⁶⁴.

The use of quantitative methods with quasi-experimental designs aims to allow research to be conducted systematically in realistic conditions where the results of the study can show that PBL learning has a positive impact on students. There is a factor of convenience when implementing it in the classroom and adjusting school conditions because the design of the approach is a realistic and flexible experiment, accurate measurement with a quasi-experimental design ⁶⁵. Another quantitative research method that is widely enjoyed is classroom action research with 3 articles, namely Arifin ⁶⁶, Atwan ⁶⁷, Putra ⁶⁸. As for other designs such as Pre-experimental design, there is only one, namely Sianturi ⁶⁹, and the next design is also only one, namely descriptive statistics ⁷⁰.

Table 2 lists the use of qualitative methods in PBL in learning. Science reached 13 articles. This qualitative method can understand the process in depth so that it can explore more broadly the student experience. In addition to exploring the potential of student experiences and perspectives, adapting to exploratory research behavior so that it can reveal the dynamics that occur in the classroom, and finally the use of qualitative methods can maintain the authenticity of the data without any intervention in quantifying the validity of the data ⁷¹.

⁵⁵ Ade Dian Silvia, Fenny Roshayanti, and Ngurah Ayu Nyoman M, " The Effect of Problem Based Learning Model on Students' Science Learning Outcomes " Grade IV of Gayamsari 02 Public Elementary School."

⁵⁶ Windasari , Harjono , and Astria, " The Effect of Problem Based Learning Model on Science Learning Outcomes ."

⁵⁷ Ningsih, Nasution, and Dayu, " The Effect of Problem Based Learning Model on Science Learning Outcomes for Grade 5 Elementary School Students on the Material of My Rich Indonesia ."

⁵⁸ Rambe , Khaeruddin , and Ma'ruf , " The Influence of Problem Based Learning Model on Ability Critical Thinking and Science Learning Outcomes in Elementary School Students ."

⁵⁹ Anfal, Wibawa, and Margunayasa , " Description The Influence of the Problem Based Learning Model on Motivation and Achievement of Students' Science Learning Class V."

⁶⁰ R and Atmojo , " The Effectiveness of the Problem Based Learning (PBL) Model on Ability Problem Solving and Student Motivation in Science Learning in Grade V of SD Negeri 1 Padokan ."

⁶¹ Setiawan, Suma, and Suastra , " Learning Model Based Problem Increase Motivation and Learning Outcomes of Students in Science Elementary school ."

⁶² Susilawati and Supriyatno , "Problem-Based Learning Model in Improving Critical Thinking Ability of Elementary School Students."

⁶³ Sari, Wijayanto , and Leritara , "Increasing Student Learning Motivation in Ipas Subject Through Problem Based Learning Model."

⁶⁴ Haryanti et al., "Improving the Critical Thinking Skills of Elementary School Students through Problem Based Learning and Inquiry Models in Social Science Learning."

⁶⁵ Nofziarni , Fitria, and Bentri , " The Influence The Use of Problem Based Learning (PBL) Models on Learning Outcomes Student In Elementary School."

⁶⁶ Arifin et al., " Application of PBL Model in Science Learning for Increase Student Motivation and Learning Outcomes."

⁶⁷ Artawan, Rati, and Pajarastuti , " Application of Problem Based Learning Model for Improving Students' Science Learning Outcomes Elementary school ."

⁶⁸ Putra and Lestari, *The Application of Problem Based Learning Model Assisted by Audio-Visual Media to Improve Social Science Outcomes in 4th Grade 5 Selat Hulu Elementary School* .

⁶⁹ Sianturi , Siagian , and Pasaribu , " The Influence of Problem Based Learning Models on Ability Critical Thinking of Fifth Grade Elementary School Students in Science Subjects."

⁷⁰ Nasaruddin , Atjo , and Tiara , " The Effect of Problem Based Learning (PBL) Model on Science Learning Outcomes of Fifth Grade Students at SDN 032 Inpres" Pambusuang Regency Polewali Mandar."

⁷¹ Rosida and Nuvitalia , " Analysis of the Problem Based Learning Model Against Ability Critical Thinking in Science Learning for Grade IV SDN Gayamsari 02 Semarang."

Qualitative research with various designs including library research, field research, literature review, and classroom action research. Of the 4 article designs, the field research design has 4 articles, namely, Rosnawati ⁷², Sari ⁷³, Prayogo ⁷⁴, Rosida ⁷⁵. Other designs such as classroom action research have 4 articles, namely, Karimah ⁷⁶, Ratnasari ⁷⁷, Aliah ⁷⁸. Qualitative research with a literature review design has 3 articles Aprina ⁷⁹, Adillah ⁸⁰, Aghel ⁸¹. Qualitative research with a library research design only has 2 articles, namely Harefa ⁸², Nadiyah ⁸³.

Another method that is minimal in PBL in learning Science is a mix-method because the qualitative approach functions to understand teachers and students in interacting with the PBL model in learning. Natural science, direct observation, and reflective analysis provide insight into the dynamics of classroom learning. The quantitative approach functions to measure the success of PBL implementation in learning. Science is objective and validated by combining qualitative and quantitative approaches to strengthen observations that are not based on subjective observations but are also supported by statistical data. Another function of this mixed method is to improve the quality of learning, thereby identifying the weaknesses and strengths of PBL in learning. Science ⁸⁴. Research using a mix method with a classroom action research design contains 4 articles, namely, Mukhtar ⁸⁵, Nisa ⁸⁶, Susilawati ⁸⁷, Sari ⁸⁸.

⁷² Rosnawati, Sari, and Kasmini, "Utilization of Science Learning Videos Through the Problem Based Learning (Pbl) Model in Critical Thinking Skills of Grade V Students of State Elementary School 7 Linge Banda Aceh."

⁷³ Sari et al., "Improvement Motivation Study Students in Science Learning With Using the Problem Based Learning Model for Grade IV Students at Tukangan Elementary School, Yogyakarta."

⁷⁴ HN and Prayogo, "Implementation of Learning Models Based Problem-Based Learning (PBL) in Science Learning Ecosystem Material at MI Miftahul Ulum 02 Ajung Jember."

⁷⁵ Rosida and Nuvitalia, "Analysis of the Problem Based Learning Model Against Ability Critical Thinking in Science Learning for Grade IV SDN Gayamsari 02 Semarang."

⁷⁶ Karimah, Nurfarijah, and Darmawan, "Application of Problem Based Learning (PBL) Model for Increase Motivation Study Students in the Science Subject in Grade IV of Elementary School."

⁷⁷ Ratnasari, Patta, and Juliadi, "Improvement Quality Learning Through Implementation of Problem Based Learning (PBL) Model for Students Grade II of Elementary School."

⁷⁸ Aliah, Khaerunnisa, and Sayidiman, "Implementation of the PBL Model For Increase Motivation Study Science Student Class VB Sdn 53 Makkaraeng Maros Regency."

⁷⁹ Aprina, Fatmawati, and Suhardi, "Application of Problem Based Learning Model for Develop Skills Critical Thinking in Elementary School Science Content," 2024.

⁸⁰ Adillah and Haryanti, "The Influence of Problem Based Learning Model on Ability Think Student Creativity in Science Learning."

⁸¹ Aghel, "Literature Review Regarding Learning Outcomes Science Using the PBL (Problem Based Learning) Model for Elementary School Students."

⁸² Harefa and Telaumbanua, "Improving Motivation and Interest in Learning Science Through Learning Based Problem: An Analytical Study."

⁸³ Nadiyah et al., "Implementation of Problem Based Learning in Science Learning in Class V MI / Elementary School."

⁸⁴ Susilawati and Supriyatno, "Problem-Based Learning Model in Improving Critical Thinking Ability of Elementary School Students."

⁸⁵ Mukhtar, "Analysis of the Problem Based Learning (PBL) Model Can Improve Science Learning Outcomes on the Material of Force in Students" Class IV of MI Negeri 2 Kerinci."

⁸⁶ Nisa, Iman, and Nugroho, "Improving Science Learning Outcomes Through Implementation of Problem Based Learning Model in Elementary Madrasah."

⁸⁷ Susilawati and Supriyatno, "Problem-Based Learning Model in Improving Critical Thinking Ability of Elementary School Students."

⁸⁸ Sari, Wijayanto, and Leritara, "Increasing Student Learning Motivation In Ipas Subject Through Problem Based Learning Model."

Another method in PBL research is the *Research and Development* approach which plays a role in develop models learning *Problem-Based Learning* . This *research and development* method can identify the needs of both students and teachers based on analysis. It designs teaching materials using the PBL model , validates them to ensure high quality, tests their effectiveness through experiments, and conducts revisions optimally. Therefore, *research and development* in the *Problem-Based Learning (PBL) model* in learning Science does not focus on theoretical analysis alone but produces real products ⁸⁹. Research and Development approach, (R&D there are 3 articles namely, Zahra ⁹⁰, Pratama ⁹¹, Triyanti ⁹².

The extensive use of quantitative methods in quasi-experimental designs in PBL learning aims to measure or assess the effectiveness of the PBL learning model so that data can be measured accurately, hypothesis validation, generalizability, and data that is consistently measurable and increases confidence in the results of PBL learning. ⁹³However, further examination is needed because, as seen in Table 2 , research and development research is minimally used in PBL model research . This should be an opportunity for further research. Essentially, using research and development in the PBL model can facilitate students who experience difficulties with the existing material, so that the research and development method allows the development of learning media according to their needs. The research and development method also produces innovative products that can be tested for validation and effectiveness, so this is a solution to difficult learning problems ⁹⁴.

Based on the various articles on PBL learning in Table 1, it is clear that there is not much research examining how the PBL learning model directly impacts three main aspects: learning outcomes, learning motivation, and critical thinking skills comprehensively. However, based on the studies above in Table 1, only studies were found that focused on improving only one aspect, for example, improving student learning outcomes and learning motivation through interactive media. In this case, no PBL model has been found that is able to integrate these aspects, namely learning outcomes, critical thinking, and learning motivation, in a sustainable manner in the context of science learning. Therefore, in this case, there is a need for a learning model that can consistently improve learning outcomes, motivation, and critical thinking skills in science material. As a solution, one of the learning models studied is the PBL Model , which places students as active subjects to solve real problems relevant to students' lives. The potential of PBL shows that it builds critical thinking skills because the method encourages students to analyze, evaluate, and make decisions from existing problems. With the PBL learning model applied in science learning, it has an impact on improving student learning outcomes, critical thinking , and student learning motivation ⁹⁵.

⁸⁹ Triyanti et al., "Problem Based Technology and Science Development to Improve Science Learning Outcomes in Elementary Schools."

⁹⁰ Zahra and Wulandari, "Development of Happy Notes PERUGI Learning Media (Energy Transformation) Based on Problem Based Learning to Improve Student Learning Outcomes in Natural and Social Science Subjects in Grade IV of Elementary School."

⁹¹ Pratama and Setyasto , *Development of Prezi Media Based on Problem-Based Learning (PBL) Model in Natural and Social Science Subjects in Class IV Elementary School* .

⁹² Triyanti et al., "Problem Based Technology and Science Development to Improve Science Learning Outcomes in Elementary Schools."

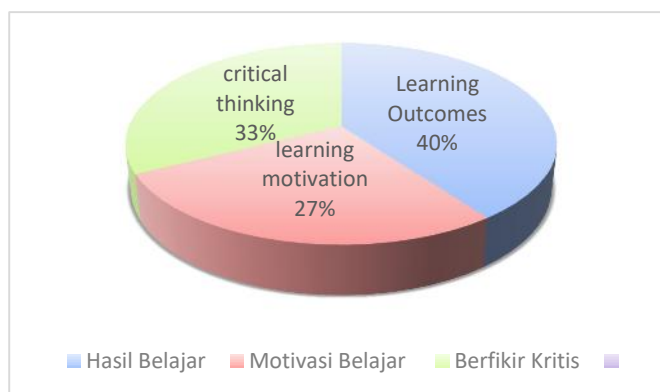
⁹³ Lupik, Nurasiah , and Nurmeta , " On the Outcomes of Science Learning for Grade V at Tegallega State Elementary School ."

⁹⁴ Zahra and Wulandari, "Development of Happy Notes PERUGI Learning Media (Energy Transformation) Based on Problem Based Learning to Improve Student Learning Outcomes in Natural and Social Science Subjects in Grade IV of Elementary School."

⁹⁵ Rafiadilla , " Research on PBL Learning Models in Elementary Schools: Systematic Literature Review."

In addition to examining the methods used, this study also examines various research focuses with the aim of assessing the balance of the impact of PBL learning . This study focuses on articles that are then grouped into three groups to facilitate the review. These groups are studies on the impact of PBL learning on learning outcomes, studies on PBL learning on critical thinking skills , and studies on PBL learning in learning. Science impacts student motivation. This can be seen from the three percentages in Figure 1.

Figure 1. Comparison of Previous Research Methods



With the focus of research related to the study of PBL learning in science lessons impacting learning outcomes, 16 articles, research related to the study of PBL learning impacting motivation, 11 articles, and research related to the study of PBL learning impacting learning outcomes. Science has an impact on critical thinking , there are 13 articles. If seen based on the percentage of Figure 1, it can be seen that research related to the study of PBL learning in learning Science has an impact on learning outcomes with a percentage of 40%, learning studies PBL impact on critical thinking with a percentage of 33%, and the PBL learning study impacted learning motivation with a percentage of 27%.

Looking at the data that has been obtained, the most researched studies on PBL learning have an impact on learning outcomes with a percentage of 40% including articles discussing the PBL model being able to improve student learning outcomes in elementary schools / MI ⁹⁶, learning models PBL can improve student learning outcomes ⁹⁷, the effectiveness of the PBL learning model to improve learning outcomes in science lessons on the style of class IV students at MI ⁹⁸, improving the quality of learning outcomes through the application of PBL to class II students at SD Negeri 1 Bendoharjo ⁹⁹, the effectiveness of the PBL learning model to improve science learning outcomes for class V students at SD Negeri Tegallega ¹⁰⁰, and

⁹⁶ Nadiyah et al., " Implementation of Problem Based Learning in Science Learning in Class V MI / Elementary School."

⁹⁷ Nofziarni , Fitria, and Bentri , " The Influence The Use of Problem Based Learning (PBL) Models on Learning Outcomes Student In Elementary School."

⁹⁸ Mukhtar, " Analysis of the Problem Based Learning (PBL) Model Can Improve Science Learning Outcomes on the Material of Force in Students" Class IV of MI Negeri 2 Kerinci ."

⁹⁹ Ratnasari , Patta, and Juliadi , " Improvement Quality Learning Through Implementation of Problem Based Learning (PBL) Model for Students Grade II of Elementary School."

¹⁰⁰ Lupik, Nurasiah , and Nurmeta , " On the Outcomes of Science Learning for Grade V at Tegallega State Elementary School ."

articles about to determine the influence of the PBL learning model on the learning outcomes of class IV science students at Gayamasari Elementary School ¹⁰¹.

Other articles regarding PBL learning which impacts learning outcomes among them article the influence of the PBL model on the learning outcomes of students in science subjects in grade IV of SD Negeri 2 Anggaraksa ¹⁰², analyzing the effectiveness of the PBL model on the learning outcomes of grade 5 elementary school students on the material of My Rich Indonesia in science subjects , the influence of ¹⁰³the application of PBL on the learning outcomes of grade V science at SD 032 Inpres Pambusuang ¹⁰⁴, the influence of PBL on the ability of science learning outcomes in elementary school ¹⁰⁵, improving science learning outcomes through the implementation of PBL in Madrasah Ibtidaiyah ¹⁰⁶, the application of the PBL learning model in improving science learning outcomes for elementary school students ¹⁰⁷, the effectiveness of PBL on science learning outcomes in elementary school ¹⁰⁸, and the effectiveness of developing the effectiveness of PBL-based teaching materials in improving the learning outcomes of grade IV students in elementary school ¹⁰⁹.

Other articles regarding PBL learning which impacts learning outcomes among them article The influence of the PBL model on student learning motivation and student learning outcomes ¹¹⁰, the development of PBL-based Prezi learning media in improving student learning outcomes in fourth grade science ¹¹¹, the development of PBL-based Happy Notes learning media in improving student learning outcomes in science ¹¹², and the application of *the Problem Based Learning (PBL)* model supported by audio-visual media in improving science learning outcomes in Selat Hulu Elementary School students ¹¹³. The influence of PBL

¹⁰¹ Ade Dian Silvia, Fenny Roshayanti, and Ngurah Ayu Nyoman M, " The Effect of Problem Based Learning Model on Students' Science Learning Outcomes " Grade IV of Gayamsari 02 Public Elementary School."

¹⁰² Windasari , Harjono , and Astria, " The Effect of Problem Based Learning Model on Science Learning Outcomes ."

¹⁰³ Ningsih, Nasution, and Dayu, " The Effect of Problem Based Learning Model on Science Learning Outcomes for Grade 5 Elementary School Students on the Material of My Rich Indonesia ."

¹⁰⁴ Nasaruddin , Atjo , and Tiara, " The Effect of Problem Based Learning (PBL) Model on Science Learning Outcomes of Fifth Grade Students at SDN 032 Inpres" Pambusuang Regency Polewali Mandar."

¹⁰⁵ Rambe, Khaeruddin, and Ma'ruf , " The Influence of Problem Based Learning Model on Ability Critical Thinking and Science Learning Outcomes in Elementary School Students ."

¹⁰⁶ Nisa, Iman, and Nugroho, " Improving Science Learning Outcomes Through Implementation of Problem Based Learning Model in Elementary Madrasah."

¹⁰⁷ Artawan, Rati, and Pajarastuti , " Application of Problem Based Learning Model for Improving Students' Science Learning Outcomes Elementary school ."

¹⁰⁸ Aghel, " Literature Review Regarding Learning Outcomes Science Using the PBL (Problem Based Learning) Model for Elementary School Students ."

¹⁰⁹ Triyanti et al., "Problem Based Technology and Science Development to Improve Science Learning Outcomes in Elementary Schools."

¹¹⁰ Safitri , Hadi, and Widiasih , "Effect of the Problem Based Learning Model on the Students' Motivation and Learning Outcomes."

¹¹¹ Pratama and Setyasto , *Development of Prezi Media Based on Problem-Based Learning (PBL) Model in Natural and Social Science Subjects in Class IV Elementary School .*

¹¹² Zahra and Wulandari, "Development of Happy Notes PERUGI Learning Media (Energy Transformation) Based on Problem Based Learning to Improve Student Learning Outcomes in Natural and Social Science Subjects in Grade IV of Elementary School."

¹¹³ Putra and Lestari, *The Application of Problem Based Learning Model Assisted by Audio-Visual Media to Improve Social Science Outcomes in 4th Grade 5 Selat Hulu Elementary School .*

has an impact on student learning outcomes. The model is effective because it involves students in real-life problem-solving activities and then enhances them with their learning activities, so that students are able to understand relevant concepts and find solutions. Students can also share ideas and respect the opinions of others when working together ¹¹⁴.

Study of PBL learning in learning Science has an impact on critical thinking with a percentage of 33%, including, the PBL learning model can improve critical thinking skills in elementary school science lessons ¹¹⁵, the influence of the PBL learning model oriented towards environmental literacy on the critical thinking skills of elementary school students ¹¹⁶, the influence of the PBL model on students' creative thinking skills in science learning ¹¹⁷, the influence of the PBL model on the critical thinking skills of fifth grade elementary school students in science subjects ¹¹⁸, and the influence of PBL on the critical thinking skills of fifth grade students at Margajaya State Elementary School ¹¹⁹,

Other articles regarding PBL learning which has an impact on thinking critical among them article about The influence of learning with PBL assisted by learning videos on students' critical thinking skills in grade V science at MI Ma'arif Kaliheruk, Garung District in 2023/2024 ¹²⁰, Application of the PBL model in science learning on ecosystem material in training critical thinking skills at MI Miftahul Ulum 02 ¹²¹, analysis of the PBL learning model in students' critical thinking skills at SDN Gayamsari 02 Semarang ¹²², and articles about analyze the effectiveness of the PBL model in improving critical ¹²³thinking skills .

Other articles regarding PBL learning which has an impact on thinking critical among them article about The use of video media in science lessons using the PBL model to improve the critical thinking skills of fifth grade students at SDN 7 Linge, Banda Aceh ¹²⁴, the influence

¹¹⁴ Francisca Prabasari et al., *EDUKATIF: JOURNAL OF EDUCATIONAL SCIENCES Differences between Problem Based Learning and Project Based Learning Models on Learning Outcomes Elementary School Students Abstracts* , 3, no. 2 (2021): 496–504.

¹¹⁵ Aprina , Fatmawati , and Suhardi , " Application of Problem Based Learning Model for Develop Skills Critical Thinking in Elementary School Science Content , " 2024.

¹¹⁶ Binassevi , " The Influence of Problem Based Learning Model Oriented Literacy Environment To Skills Critical Thinking of Elementary School Students." "

¹¹⁷ ' Adiilah and Haryanti , " The Influence of Problem Based Learning Model on Ability Think Student Creativity in Science Learning . " "

¹¹⁸ Sianturi , Siagian , and Pasaribu , " The Influence of Problem Based Learning Models on Ability Critical Thinking of Fifth Grade Elementary School Students in Science Subjects." "

¹¹⁹ Fadillah et al. , " The Influence of the Problem Based Learning Model on Ability Critical Thinking in Science Learning for Fifth Grade Students at Public Elementary Schools." "

¹²⁰ Rosiana , Khoiri , and Sugiyanto , " The Effect of Problem Based Learning Model Assisted by Learning Videos To Ability Critical Thinking of Students in Science Subjects of Grade V at MI Ma ' Arif Kaliheruk Subdistrict Garung Academic Year 2023 / 2024." "

¹²¹ HN and Prayogo , " Implementation of Learning Models Based Problem-Based Learning (PBL) in Science Learning Ecosystem Material at MI Miftahul Ulum 02 Ajung Jember." "

¹²² Rosida and Nuvitalia , " Analysis of the Problem Based Learning Model Against Ability Critical Thinking in Science Learning for Grade IV SDN Gayamsari 02 Semarang." "

¹²³ Susilawati and Supriyatno , "Problem-Based Learning Model in Improving Critical Thinking Ability of Elementary School Students." "

¹²⁴ Rosnawati , Sari, and Kasmini , "Utilization of Science Learning Videos Through the Problem Based Learning (Pbl) Model in Critical Thinking Skills of Grade V Students of State Elementary School 7 Linge Banda Aceh." "

of the PBL learning model on critical thinking skills and student motivation ¹²⁵, and improving the critical thinking skills of elementary school students through the PBL model ¹²⁶. PBL learning Science can improve critical thinking skills, namely by presenting real problems so that students are able to analyze, evaluate, and find solutions. The PBL model in learning Science is able to provide a meaningful learning experience that is effective in helping understand the material more easily, not just memorizing it but relating it to life ¹²⁷.

The study of PBL learning has an impact on learning motivation with a percentage of 27% including, the application of the PBL learning model in increasing student learning motivation in science lessons in grade IV of Elementary School ¹²⁸, increasing student learning motivation in science learning by implementing PBL in grade V students of SDN 53 Makkaraeng, Maros Regency ¹²⁹, increasing student learning motivation in science lessons that implement PBL in grade IV of SD Negeri Tukangan Yogyakarta ¹³⁰, the influence of PBL learning on the motivation and science learning achievement of grade V students at SDN 2 Tente ¹³¹, increasing motivation and learning outcomes in science lessons by implementing PBL ¹³².

Other articles regarding PBL learning which has an impact on motivation Study among them article about The effectiveness of the PBL model in improving problem solving and increasing student motivation at SDN 1 Padokan science lessons ¹³³, analyzing differences in motivation and student learning outcomes using the PBL model ¹³⁴, PBL model learning can increase student motivation and interest in learning science ¹³⁵, increasing student learning motivation in science learning with PBL based on Wordwall media in class V SDN Gunting ¹³⁶, increasing learning motivation in science subjects by implementing PBL ¹³⁷. The PBL

¹²⁵ Festiawan et al., "The Problem-Based Learning: How the Effect on Student Critical Thinking Ability and Learning Motivation in COVID-19 Pandemic?"

¹²⁶ Haryanti et al., "Improving the Critical Thinking Skills of Elementary School Students through Problem Based Learning and Inquiry Models in Social Science Learning."

¹²⁷ Aprina, Fatmawati, and Suhardi, "Application of Problem Based Learning Model for Develop Skills Critical Thinking in Elementary School Science Content," 2024.

¹²⁸ Karimah, Nurfarijah, and Darmawan, "Application of Problem Based Learning (PBL) Model for Increase Motivation Study Students in the Science Subject in Grade IV of Elementary School."

¹²⁹ Aliah, Khaerunnisa, and Sayidiman, "Implementation of the PBL Model For Increase Motivation Study Science Student Class VB Sdn 53 Makkaraeng Maros Regency."

¹³⁰ Sari et al., "Improvement Motivation Study Students in Science Learning With Using the Problem Based Learning Model for Grade IV Students at Tukangan Elementary School, Yogyakarta."

¹³¹ Anfal, Wibawa, and Margunayasa, "Description The Influence of the Problem Based Learning Model on Motivation and Achievement of Students' Science Learning Class V."

¹³² Arifin et al., "Application of PBL Model in Science Learning for Increase Student Motivation and Learning Outcomes."

¹³³ R and Atmojo, "The Effectiveness of the Problem Based Learning (PBL) Model on Ability Problem Solving and Student Motivation in Science Learning in Grade V of SD Negeri 1 Padokan."

¹³⁴ Setiawan, Suma, and Suastra, "Learning Model Based Problem Increase Motivation and Learning Outcomes of Students in Science Elementary school."

¹³⁵ Harefa and Telaumbanua, "Improving Motivation and Interest in Learning Science Through Learning Based Problem : An Analytical Study."

¹³⁶ Cipta, Wahdan, and Andini, "Efforts to Improve Motivation Learning in Science Learning with a Problem Based Learning Model Based on Wordwall Media."

¹³⁷ Rosnawati, Sari, and Kasmini, "Utilization of Science Learning Videos Through the Problem Based Learning (Pbl) Model in Critical Thinking Skills of Grade V Students of State Elementary School 7 Linge Banda Aceh."

learning model in science learning is able to increase student learning motivation, with this model students are faced with real problems that must be solved so they can discuss and draw conclusions¹³⁸.

CONCLUSION

The results of this study show that quantitative research is the top choice of capital studies on Problem Based Learning in science lessons, namely 20 articles, followed by qualitative methods and mixed methods and research and development. Qualitative research with a liberal research design is the type of research that is least in demand. In quantitative research with a pre-experimental design and descriptive statistics is the research that is least in demand. And mixed method research and research and development are also the least in demand. The focus of research studies in the PBL model of science lessons is that the impact of such learning is to increase learning outcomes by 40% and improve critical thinking skills by 33% and finally the lack of focus on learning motivation, namely with a percentage of 27 % . Judging from these data, the lack of studies with a focus on the PBL model is an opportunity for further researchers to examine the topic of discussion in depth.

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¹³⁸ Karimah, Nurfarijah, and Darmawan, " Application of Problem Based Learning (PBL) Model for Increase Motivation Study Students in the Science Subject in Grade IV of Elementary School ."

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