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LITERATURE REVIEW: THE EFFECT OF PBL MODEL ON STUDENTS' PROBLEM SOLVING SKILLS

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Abstract

This study aims to examine the effect of PBL model on students' problem solving ability. The form of this research is a literature review. The data collection technique is sourced from secondary data collected based on the keyword influence of the PBL model on students' problem solving skills, published articles with a range of years 2014-2024 obtained from google scholar. The amount of data obtained is 10 articles that meet the criteria for further review. Based on the results of the study of the 10 articles obtained, it was found that: 1) the PBL model can improve students' solving ability, 2) there is a significant difference when using the PBL model compared to using conventional and expository models, 3) in addition to improving problem solving ability, the PBL model can also improve science process skills, critical thinking skills and student learning outcomes, 4) the average score in the experimental class is higher than the control class. 5) in supporting the success of the PBL model during the learning process, other media can be used.

Keywords: PBL, model, problem, solving, ability

Introduction

Problem solving ability is needed by students to be used to solve real problems that students encounter in their environment, so that students are accustomed to scientific thinking (Zuchri & Irawati, 2021). Problem solving skills familiarize students in independently searching for various concepts in a holistic, meaningful, authentic and applicable manner (Zuchri & Irawati, 2021). Problem solving ability is essentially a goal in education that becomes the need for students in everyday life (Mariana et al., 2022).

According to the exposure (Utami & Roektiningroem, 2018), science learning still focuses on mastering concepts using conventional learning models by lecturing, this results in students' ability to solve problems still being low and there is no improvement. Problem solving skills are very important in science learning (Sumiantari et al., 2019).

The ability of students to solve problems is low, this is due to the fact that few teachers teach materials that have not applied parameters that refer to improving problem solving skills during the learning process and dominate learning using the lecture method, which means it is still teacher-centered (Iolanessa et al., 2020). The actual situation is that there are still few schools in Indonesia that apply problem solving in learning (Ermawan & Fauziah, 2023). In school learning and learning activities are required to be interesting, challenging, and encourage students to participate in productivity to develop their interests and talents (Ariandi, 2017). Science learning focuses on supporting students in improving process skills, understanding concepts and can be used in the surrounding environment (Priyani & Nawawi, 2020). Science learning students are not active in learning activities and only wait for the material provided by the teacher, not exploring the acquisition of knowledge in other ways, such as problem-solving skills which are learner-centered (Hanifah, 2023).

Improvement in learning can be done by considering several factors that support changes in the quality of learning, one of which is by choosing the right learning model to improve students' problem solving skills (Asiyah et al., 2021). The problem-based learning model is a learning model that presents problems to students that can develop higher knowledge and skills (Novianti et al., 2020). The PBL model is a model created for students to gain useful knowledge to solve problems and form intelligence in group cooperation (Ionita & Simatupang, 2020). In applying the PBL model, it is hoped that it will make it easier for students to understand the subject matter and can improve problem solving skills and then improve learning outcomes (Aulia & Budiarti, 2022). This article will discuss the effectiveness of using the PBL model to measure students' problem solving skills when compared to using other learning models.

Based on the background above, this study aims to conduct a literature review on the effect of the PBL model on students' problem solving skills. And to find out the effect of PBL model on students' problem solving ability.

Research Method

The method used in this research is the literature review method. Literature review is a research activity carried out by collecting information and data using various library materials such as reference books, previous research results, articles, notes and various journals related to the problem to be solved (Altatri & Ardi, 2024). Data collection techniques are secondary data sources, the articles obtained come from google scholar with the keywords of the influence of the PBL model on students' problem solving skills with a range of 2014-2024.

Result and Discussion

The results showed that there were 10 articles published in the range of 2014-2024 with the keywords of the influence of the PBL model on students' problem solving skills which are stated in table 1 below.

Table 1. List of relevant articles

No.	Title	Author
1.	The Effect of Problem Based Learning Model (PBL) on Students' Science Problem Solving Ability	(HS & Marianus, 2022)
2.	The Effect of Problem Based Learning Model on Problem Solving Ability	(Nasution, 2020)
3.	The Effect of Problem-Based Learning Model (PBL) on Science Problem Solving Skills of Class VIII Students of SMPN 2 Watansoppeng	(Yulistiawati et al., 2019)
4.	The Effect of Problem Based Learning (PBL) Learning Model on the Ability to Solve Science Learning Problems at SMPN 4 Kepahiang	(Hasanah & Irwandi, 2019)
5.	The effect of problem-based learning model on science learning outcomes of seventh grade junior high school students in terms of problem solving skills	(Shinta & Sujatmika, 2020)
6.	The Effect of Problem Based Learning Model (PBL) on Physics Problem Solving Ability of Students of SMA Negeri 11 Muaro Jambi	(Firmansyah et al., 2022)
7.	The Effect of Problem Based Learning Model on Physics Problem Solving Ability through Controlling Numerical Talent of SMP Students	(Dewi et al., 2014)
8.	The Effect of Problem-Based Learning Model on Solving Ability	(Suardani et al., 2014)
9.	The Effect of Problem Based Learning Model Assisted by Gagung Duran Application on Students' Problem Solving Ability	(Albab et al., 2021)
10.	The Effect of Problem Based Learning Model on Improving Student Problem Solving in Science Learning	(Mariana et al., 2022)

Based on the 10 articles that have been reviewed with the keyword influence of the PBL model on students' problem solving skills, saying that the PBL model can improve students' problem solving skills. The results of the review of the effect of the PBL model on students' problem solving skills are summarized as follows.

Article 1 uses the expository learning model to compare with the PBL model for improving problem solving skills. The results obtained are the use of PBL models can improve students' problem solving skills. The average problem solving ability of students in the Problem Based Learning (PBL) class is 82.24 while the problem solving ability in the expository class is 71.04 from these data it appears that there is a difference in the average problem solving ability of students taught with Problem Based Learning (PBL) higher than the average problem solving ability of students taught with expository learning.

Article 2 says that the use of PBL models can improve problem solving skills compared to using conventional models and is influenced by the level of critical thinking skills of students. Significant results in this study can be caused because problem-based learning activities tend to invite students to learn more actively, besides problem-based learning helps students to develop problem-solving skills in discussion activities, where

discussion activities condition students to work in teams, find ideas, and develop students' thinking in solving problems so that a process of social interaction with other friends in discussion activities spurs the formation of new ideas and enriches the intellectual development of students.

Article 3 states that the problem-based learning model is in the high category (N-Gain score = 0.81) compared to the conventional learning model in the medium category (N-Gain score = 0.68) which means that the problem-based learning model affects the science problem solving skills of VIII grade students of SMPN 2 Watansoppeng on the subject matter of additives in food and addictive substances.

Article 4 says that the use of PBL models can improve problem solving skills compared to using conventional models and can also improve students' cognitive outcomes. The PBL model is better than the conventional learning model (Lecture) seen from the average ability to solve the problem of the experimental class using the PBL model value 80.6, and control 59.2 While seen from the cognitive learning outcomes PBL model value 81, and control 60.48.

Article 5 says that getting significant results on the use of the PBL model in class can improve the problem solving skills and learning outcomes of students compared to conventional models, this is seen from the science learning outcomes taught with the PBL model obtained an average in the experimental class of 22.67 including the very high category, and the class with the lecture method of 17.47 in the high category. And the problem-solving skills of students taught with PBL obtained an average of 78.54 which included a high category and a class with a lecture method of 70.38, a high category.

Article 6 says that the use of PBL learning model significantly affects the physics problem solving ability of students in the cognitive domain. This is evidenced by the results of the physics problem solving ability of students in experimental and control classes. This can be seen from the analysis of the Physics problem solving ability test of students in the experimental class with an average value of 72.06 While, the problem solving ability contained in the control class with an average of 57.68.

Article 7 The results showed that there were differences in problem solving ability between groups of students who learned through the PBL model and groups of students who learned through the direct learning model. the average value of physics problem solving ability of students in the experimental class was higher than the average value of students in the control class. The average value of physics problem solving ability of students in the experimental class is 71.88 with high qualification while the average value of students in the control class is 49.76 with less qualification.

Article 8 says that there are differences in problem-solving abilities, and science process skills between groups of students who learn by using a problem-based learning model and groups of students who learn by using a direct learning model. This means that the use of the PBL model can not only improve problem solving skills but also can improve the science process skills of students at the same time.

Article 9 shows that the PBL model can be combined with the Gagung Duran application to help the learning process. The results prove that using the Problem Based Learning model assisted by the Gagung Duran application can make students more independent in the learning process and students can understand the material in depth by practicing solving problems related to students' daily lives. With this research it is concluded that there is an average difference in the problem solving ability of

the experimental class compared to the control class.

Article 10 says that the application of the Problem Based Learning model can affect the problem solving ability of class VIII students of Kartikatama Metro Junior High School. From the observation of the learning activity assessment obtained the average value of learning activities from students in the experimental class 74.69 while for the dick class the average value was 72.81. From the results of the acquisition of activity values from both classes it can be seen that the activity value of the experimental class is higher than the control class.

Conclusion

Based on the results of the literature review on the effect of the PBL model on students' problem solving skills, it was found that the PBL model can significantly improve students' problem solving skills. This can be seen from the results of the average score obtained by the experimental class higher than the control class score. Then in the application of this PBL model can be combined with other media to support the success of the learning process, besides that in testing the effectiveness of PBL modl can compare it with conventional and expository models. In addition to improving problem solving ability, the PBL model can also improve critical thinking ability, science process skills and student learning outcomes.

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