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Research Article

Literacy Studies: Implementation of Problem-based Learning Models to Improve Critical Thinking Skills in Elementary School Students

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Abstract.
Students often have difficulty in developing critical thinking skills and creative thinking in problem-solving and applying concepts learned in school. The difficulty is due to weak understanding of concepts, especially for students who are in the low category; therefore, it has an impact on the low-student learning outcomes. One of the reasons for the low-learning outcomes is the difficulty in understanding a concept given by the teacher so students tend to be passive in learning activities, which has an impact on the lack of students to think both critically and creatively in applying the concepts of the material provided by the teacher. The purpose of this study is to conceptually analyze the use of problem-based learning models to improve critical thinking skills in elementary school students. The research method used in this study is a systematic literature study. The author selected 25 articles from journals and articles published during the last 10 years from 2012 to 2022. The results of this review can improve student learning outcomes in elementary schools because this model has characteristics suitable to be applied in real-life situations; in avoiding simple answers, and allowing for multiple solutions to the situation.

Keywords: Problem-based learning, critical thinking skills

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1. INTRODUCTION

Learning is an activity in which a person seeks to acquire knowledge, skills, and positive values by using various learning resources. The role of the teacher as a learning designer must not only position oneself as a motivator or facilitator, but must also be able to control how successful a person is in his role as a learner. For that, you have to choose the right strategy. Learning strategies become the decisions of professional educators in determining the various activities to be carried out, the methodology used, the material presented, the facilities and infrastructure used. It includes the type of media chosen to carry out learning activities and the type of assessment. The achievement of

competencies is a reflection of effective learning and allows teachers to choose and apply the right methods to carry out the teaching and learning process in the classroom.

Students often have difficulty developing critical thinking and creative thinking skills in solving problems and applying concepts learned in school. The difficulty is due to a weak understanding of concepts, especially for students who are in the low category, which has an impact on low student learning outcomes. One of the low learning outcomes is due to the difficulty in understanding a concept given by the teacher so students tend to be passive in learning activities which has an impact on the lack of students to think both critically and creatively thinking in applying the material concepts provided by the teacher.

Critical and creative thinking is a skill that needs to be developed from an early age. It is designed to prepare students to be critical and creative students in learning activities, mature decision-makers, and people who never stop learning, both in the school environment and in the community. This is in line with Sujarwo's research in the thesis [1], which states that the critical thinking ability of elementary school children is still very low. In his journal [2] Boud and Feletti state that Project Based Learning, as something commonly known it today, developed from an innovative health sciences curriculum introduced in North America more than 30 years ago. Medical education, with an intensive pattern of basic science lectures followed by an equally complete clinical teaching program, quickly became ineffective and ineffective. According to [3] learning model, Problem-Based Learning is very suitable to help students become active learners because it puts learning in real-world problems and makes students responsible for their learning. It has a double emphasis on helping learners develop strategies and build knowledge (cognition). This Problem Based Learning model is focused on experiential learning organized around meaningful investigation, explanation, and problem solving [3].

Based on the background above and the results of research that has been carried out by previous researchers, the author is interested in conducting literature studies from several journals or theses related to using problem-based learning models using literature studies with the title "Literacy Studies: Implementation of Problem-Based Learning Models to Improve Critical Thinking Skills in Elementary School Students". The purpose of this study is to find, search, investigate and analyze more on each relevant article or journal that uses the same study topic, thus producing a review of the article.

2. METHOD

The research method used in this study is a systematic literature study [4]. The authors selected 25 articles from major journals, including National Journal and International Journals, published over the past 10 years from 2012 to 2022. During this phase of the study, peer-reviewed books, conference papers, and journal articles are downloaded from the Google Scholar and ERIC databases. Due to their high scientific qualities, these sources are considered valid, relevant and qualified.

3. RESULTS AND DISCUSSION

3.1. Critical Thinking

According to Fisher in [1], critical thinking ability in recent years has become one of the most well-known words in global education. This is because the development of the era is increasingly advanced, which requires humans to further develop their thinking abilities.

In their journal [5] Ennis, Facione, Paul, Elder, and Bartell mention that critical thinking has general aspects such as (1) cognitive skills such as interpreting, adding, inferring, analyzing, evaluating, making proposals, creating, and making decisions according to the context; seek relevant and reliable information; adaptable and flexible to change. (2) Values such as prudence, humility, intellectual integrity, and empathy.

The purpose of critical thinking is to test opinions the results can account for that. Students are required to understand and understand more about what they learn. Critical thinking has an initial goal, which is to reveal the truth by attacking and getting rid of all that is wrong so that we will see the truth (Bono, translation by Sitompul & Yamani, 2007). Therefore, the process of critical thinking is needed. Critical thinking is not only about thinking but also at what complex stage, why, and how the process of solving it is. [6]

3.2. Model pembelajaran Problem Based Learning

The Problem Based Learning model according to Arends[7], is a learning model with a student approach to real-world problems, allowing students to build their knowledge, develop skills, students become independent, and increase their self-confidence.

Another study [8] explained the learning objectives using the problem-based learning model, namely ”(1) helping students develop thinking skills, problem-solving, and intellectual abilities; (2) Learning the various roles of adults through the participation of students in direct or simulated roles. In addition, Faturrahman (2016: 113) states ”The goal of the problem-based learning model is not to convey a large amount of knowledge to students, but rather to develop critical thinking skills and problem-solving skills and at the same time develop students' abilities to actively build their knowledge.”

The characteristics of this learning model are the use of real-life problems as materials that students need to learn to train, develop critical thinking skills, solve problems, and acquire knowledge and what is important. In this learning, the teacher does not provide a lot of information, but students are expected to be able to solve their own problems through critical thinking. Learning activities do not only refer to the acquisition of declarative knowledge but also to the acquisition of procedural knowledge. This learning is problem-based learning, so students are empowered to solve their own problems.

Applying learning with Problem based Learning models must follow certain steps. This is because the Problem based Learning model is contained in the learning model, and one of the elements of the learning model is syntax. The syntax of the problem-based learning model proposed by Arends [7] is shown in the following table:

Table 1: Syntax of the Problem-Based Learning model.

Step 1	Problem presentation
Step 2	Grouping of students
Step 3	Individual and group investigation
Step 4	Develop and present the work
Step 5	Analyze and evaluate the problem-solving process

3.3. Application of the Problem-Based Learning Model in learning

From this problem-based learning model, the authors analyzed several journals. The following is a presentation of data and analysis results from several journals and books on the application of problem-based learning in various learning, especially in elementary schools. The results of this study were obtained after carrying out a literature study that was carried out in September - October. The research data obtained are secondary

in the form of journal data as many as 25 previous research journals. The results of the data obtained can be seen in the following table:

Table 2: The results of a review of 25 journals. (Problem-Based Learning implementation in learning).

No	Background	Research results	Reference
	Student learning outcomes are low, that's because it still centered learning on the teacher as a source of information so student knowledge is still lacking	There is a significant difference in learning outcomes in science using the Mind Mapping model and student learning outcomes using the PBL learning model for fourth-grade elementary school students.	[9]
	Learning that does not provide opportunities to express ideas to complete answers and understand the material so that passive students are teacher-centered learning	The PBL learning model can improve the mathematical problem-solving ability of 4th-grade elementary school students because problem-solving-based learning is important to equip students to get used to solving problems.	[10]
	The subject matter about the area of the field is a material that is very close to real life. Many events that we encounter every day use area measurements.	The PBL model affects the learning outcomes of mathematics subjects in the broad area of the field in third-grade elementary school students.	[11]
	The low level of independence and mathematical communication skills in students is caused by teachers still using conventional learning, so students become passive and less enthusiastic.	There is an influence of the problem-based learning model on independent attitudes and mathematical communication skills of fifth grade elementary school students	[12]
	Students will find it difficult if they are required to work on other questions with the correct sequence of completion and different ways of solving them so that students' thinking skills are low.	There was an increase in learning outcomes in Mathematics, as evidenced by an increase in grades from the initial conditions of completeness of the learning conditions by 24 students (66.7%) increased in cycle I by 28 students (77.8%) and in cycle II it increased to 31 students (86.1%).	[13]
	Teaching teachers still use one-way communication or what is often called the lecture method. To make students do things that can interfere with ongoing teaching and learning activities.	The application of the Problem Based Learning model assisted by Audiovisual media can improve learning outcomes in fourth-grade students	[14]
	Civics learning seems stiff, less flexible contains memorization, and is boring as long as it goes on so that critical thinking which is part of higher-order thinking becomes neglected	The application of the problem-based learning model can improve the critical thinking skills of grade 5 students in Civics at Muhammadiyah Elementary School marked by an increase in the average test results for students' critical thinking skills from Cycle I to Cycle II of 51.61% to 70.97%.	[6]
	The effect of implementing the Project Based Learning (PjBL) and Problem Based Learning (PBL) learning models on students' critical thinking skills	The average critical thinking ability of the experimental group students (PjBL class) is higher than the average critical thinking ability of the control group students (PBL class)	[15]

Based on the results of the study above, more than 80% stated that student learning outcomes using the PBL learning model had increased compared to the conventional learning model. Students' critical thinking skills using the Problem Based Learning model

Table 2: The results of a review of 25 journals. (Problem-Based Learning implementation in learning).

No	Background	Research results	Reference
	The application of learning models that are less innovative and not student-centered causes the low level of students' ability in critical thinking.	There are differences in the ability to think critically in the problem-based learning and discovery learning models in fourth grade mathematics. Evidenced by the results of the ability to think critically in the problem-based learning model with an average of 74.65 and the discovery learning model with an average of 80.57 with a difference of 5.91.	[16]
	The difficulty of elementary school students in practicing the ability to change the verbal language into mathematical models in the form of word problems, where story questions are similes of real-life problems faced	The level of effectiveness of the Problem Based Learning model is higher than the Inquiry learning model. This is supported by the level of effectiveness calculated by the N-Gain analysis on the Problem Based Learning model of 48.9681% which is included in the less effective category, while the control class with the Inquiry learning model of 38.9476% is included in the ineffective category.	[17]
	The physics learning process is still teacher-centered by applying the lecture method. The use of learning media that can make it easier for teachers and students to explain and understand the material is still underused.	The developed interactive learning media is valid, effective, and efficient to improve students' creative thinking skills in physics.	[18]
	I center implementation of thematic learning that is carried out online on the teacher so that it makes students not active when participating in lessons.	From this research, they reflect it in an active and fun learning environment, so that the Problem Based Learning model can improve student learning outcomes.	[19]
	It still orient learning to the lecture method, with fewer media, and is still teacher-centered. This makes students participate less in learning activities, more easily bored, and less focused when studying.	Actions on student learning outcomes in science learning through the Problem Based Learning (PBL) model for fifth-grade students at SD Negeri Peureumeue, Kaway XVI District, West Aceh Regency, were completed only until cycle II.	[20]
	Low student learning outcomes. We can see this from the initial data on students' daily test scores, which are still below the KKM.	There is a significant difference between the social studies economics learning outcomes using the PBL learning model and the conventional learning model in class X students of SMK Negeri 1 Patilanggio	[21]
	Elementary students have not been able to understand the concept of learning mathematics correctly and precisely. Because learning mathematics is related to how to solve problems.	There is a significant effect of the use of the Problem Based Learning model on the mathematics learning outcomes of fourth-grade elementary school students	[22]
	Student activity in learning is limited to listening to the teacher and discussion activities, there are no other activities that support the learning process. Such learning management will cause student learning activities to not be optimal.	It proved Problem Based Learning to increase mathematics learning activities for 4th-grade students at SDN Petirrejo, Ngadirejo District, based on the description of the percentage of learning activity data from cycle I and cycle II.	[23]

are higher than learning to use the Problem-Solving model [31]. The level of effectiveness of the Problem Based Learning model is higher than the Inquiry learning model [17].

Table 2: The results of a review of 25 journals. (Problem-Based Learning implementation in learning).

No	Background	Research results	Reference
	The thematic learning outcomes for grade 5 science content are still low, causing students to be inactive in the science learning process.	The application of the Problem Based Learning model can improve students' critical thinking skills and learning outcomes. The results of students' critical thinking analysis from pre-cycle, cycle I, and cycle II are increasing.	[24]
	There are still many students who have not achieved the KKM 70 in mathematics learning outcomes at SD Noborejo 01 grade 5, we know that students tend to be more passive when learning mathematics. In addition, students in working on math problems still tend to memorize formulas.	The Problem Based Learning model can improve the critical thinking skills of fifth-grade students at SD N Nobororejo 01 Salatiga in mathematics on geometric material, as evidenced by the increase in student learning outcomes in cycle I, some students completed KKM $\leq$ 70, 22 students experienced an increase of 33 students in cycle II.	[25]
	Student learning outcomes showed that out of 32 students only 6 students were in the sufficient category while 26 students were in the less category. This is due to low critical thinking skills.	The interactive media-based Problem Based Learning (PBL) learning model can improve critical thinking skills, followed by increased learning outcomes for grade 4 students at SD Negeri Dukuh 03.	[26]
	The teacher does not explore the initial knowledge of students at the beginning of learning, students do not have the opportunity to connect problems, and teachers rarely connect the material studied here with real-life problems.	The Problem-based Learning model can improve the learning outcomes of class VI students at Mulyasari 03 Public Elementary School. Students do not only listen to lectures from teachers about the material, but students can identify, analyze and draw conclusions on their problems.	[27]
	Teachers still use conventional teaching methods and tend to use the lecture method. In addition to applying the lecture method, the teacher also gives exercises only questions.	There are differences in science learning outcomes between students who follow the Tri Hita Karana oriented Problem Based Learning model and students who follow the conventional learning model in fifth grade elementary school students.	[28]
	Elementary teacher's obstacles in implementing the Problem Based Learning model in learning mathematics	The constraints experienced by the teacher are: (1) lack of time allocation to maximize activities in all phases; (2) the teacher's difficulties in directing students to problems that require solutions, students are not used to having problems without guidance; (3) teachers need sufficient time to organize students in group activities; (4) the teacher has difficulties in allocating time to guide one group to another because each group asks questions simultaneously.	[29]
	In the learning activities that have been carried out, students feel bored and not interested in the lesson.	The application of the PBL learning model is able to increase the activity and thematic learning outcomes. The results showed an increase in the percentage of students' activeness in the pre-cycle by 25% or as many as 4 active students experienced an increase in cycle I too 88% and very active then increased in cycle II to 100%.	[30]

Table 2: The results of a review of 25 journals. (Problem-Based Learning implementation in learning).

No	Background	Research results	Reference
	Students have difficulty thinking when studying mathematics, so students have a low interest in learning.	Students' critical thinking skills using the Problem Based Learning model are higher than learning to use the Problem-Solving model	[31]
	Student learning outcomes are still low. The learning process, which tends to be passive, is seen in independent work and group work so that student participation in class learning is still not optimal.	The application of problem-based learning models can improve students' thematic learning outcomes in both the cognitive and psychomotor domains.	[32]

Apart from being related to student learning outcomes, several obstacles were found in the implementation of Problem Based Learning in research [29], the constraints were mentioned as follows: (1) lack of time allocation to maximize activities in all phases, (2) the teacher's difficulties in directing students to problems that require solutions, students are not used to having problems without guidance, (3) teachers need sufficient time to organize students in group activities, and (4) the teacher has difficulties in allocating time to guide one group to another because each group asks questions simultaneously.

4. CONCLUSION

Based on the research that has been carried out and the results of data analysis obtained from problem-based learning journals, the following conclusions can be drawn: (1) The problem-based learning model can improve student learning outcomes in elementary schools, because this model has characteristics that are suitable for application in real-life situations, avoids simple answers, and allows for various kinds of solutions to these situations; (2) The problem-based learning model has steps that encourage students to actively participate in the learning process. Student activities in the learning process can train students' critical thinking skills. An emphasis on problem-solving efforts which can be achieved through increased creative thinking characterizes it. Students must actively seek information from all sources that are relevant to the problem at hand. I used the results of student analysis as a solution to the problems discussed; and (3) The problem-based learning model can be combined with other methods or strategies according to the theme or material taught in elementary schools. So that professional teachers can vary learning examples that can avoid boredom and create a pleasant atmosphere.

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