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Profile of Problem Based Learning (PBL) Model in Improving Students' Problem Solving and Critical Thinking Ability

Indra Himayatul Asri*, I Nyoman Jampel, Ida Bagus Putu Arnyana, I Wayan Suastra, and Putu Kerti Nitiasih

Universitas Pendidikan Ganesha, Bali, Indonesia

ORCID

Abstract.

The Problem Based Learning (PBL) model is a pedagogical approach that facilitates student learning and is also directly involved in the problems given during learning. In the process students have the opportunity to collaboratively solve problems. In comparison to traditional, teacher-centered learning that emphasizes memorization, the Problem-Based Learning model is student-centered. In applying the Problem Based Learning model students are directly required to be actively involved in solving problems so that of course it will form students' habits in terms of independent learning where students will actively search for their own literature and get used to practicing. problem solving. The article encompasses literature on the Problem-Based Learning model, problem-solving skills, and critical thinking. It draws from 39 Scopus-indexed international journals and includes documents to aid writers in delineating the PBL model's profile for enhancing problem-solving and critical skills. The existing literature review leads to the conclusion that the Problem-Based Learning model effectively enhances students' problem-solving abilities and critical thinking.

Keywords: problem based learning, problem solving, critical thinking

Corresponding Author: Indra Himayatul Asr; email: indra.himayatul@student.undiksha.ac.id1

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1. Introduction

In the 21st century, we are required to have various skills that we must master. By mastering the skills that must be possessed in the 21st century, it is hoped that the world of education will be able to print and prepare students to be able to master these skills so that they become individuals who are ready to face challenges in the 21st century so that they will be successful in the future. Various important skills in the 21st century must be relevant to the four pillars of life which include learning to do, learning to be, learning to know and learning to live together. The four principles each contain specific skills that need to be empowered in learning activities such as critical thinking skills, problem solving, communication skills, collaboration, creation and innovation as well as other skills. In order for these 21st century skills to be achieved, of course, this must be

done by updating various learning qualities, helping students develop participation, adjusting personalization of learning, emphasizing project/problem based learning, encouraging collaboration and communication, increasing student involvement and motivation, cultivating creativity and innovation. in learning to use appropriate learning tools, designing learning activities that are relevant to the real world empowering metacognition, and developing student-centered learning [1], [2]. All 21st century skills must be explicitly taught to students. The point is that 21st century learning has the main principle that learning must be student-centered, collaborative, contextual, and integrated with society. Here the role of the teacher in carrying out 21st century learning is very important in realizing a better future for the nation's children and ready to face the challenges of the 21st century.

The Problem Based Learning learning model is a learning model that requires students (students and students) to actively utilize various intelligences and skills in solving a problem they face. In fact, this model gives a problem to students to then solve properly so that through this learning model students will be trained in skills both critical thinking, analysis and creative thinking in solving the problems they face. Of course, the skills possessed by students will be honed and skilled, both hard skills and soft skills [3]–[5].

This Problem Based Learning or PBL learning model has several benefits including: 1) Increasing independence in learning. This approach encourages children to take initiative and responsibility for their own learning. When they are encouraged to use research and creativity, they develop skills that will serve them well into adulthood; 2). Encourage active participation of children in learning. In contrast to traditional learning which tends to require students to sit, listen, and take notes, in this approach, students sit in the driver's seat. They have to stay sharp, apply critical thinking, and think outside the box to solve problems; 3) Develop skills in the real world. The abilities that students develop are not only applied to one class or subject matter, but can also be applied to a large number of school subjects as well as everyday life outside of school. From leadership to problem-solving skills in real-life contexts; 4) Improve the ability of cooperation. Various activities in the problem-based learning approach ask students to collaborate with their classmates to find solutions. This cooperative approach encourages children to build skills such as collaboration, communication, compromise, and listening; 5) Encourage intrinsic reward. The rewards derived from problem-based learning go far beyond just an A. The student gains a sense of self-respect and satisfaction from knowing that he or she has solved a puzzle, created an innovative solution, or made a tangible product [6]–[9].

The steps in applying the problem-based learning approach include: a) Explore the problem. Gather the necessary information; learn new concepts, principles and skills about the proposed topic.; b) State what is known. Each student and group lists what they already know about the scenario and lists what areas they lack information on; c) Define the problem. Arrange problems in the context of what is already known and the information students expect to learn; d) Looking for information [10]–[12]. Look for sources and information that will help create a convincing argument: e) Investigate solutions. Make a list of possible actions and solutions to the problem, formulate and test potential hypotheses; f) Present and support the selected solution. State clearly and support the conclusions reached with relevant information and evidence; g) Review performance. This is an important step to improve students' problem-solving skills where students must evaluate their performance and plan improvements for the next problem they will try to solve.

2. Method

This study uses a literature review that examines the PBL learning model in various scientific studies. Articles obtained from reputable international journals indexed by Scopus. This is based on the fact that the indexing agency is an institution that indexes articles around the world and is a reputable indexing agency. The article was obtained from published articles in journals, literature reviews, and conferences. The keywords used are problem-solving skills and critical thinking which can assist the writer in describing the profile of the Problem Based Learning or PBL learning model in improving students' problem-solving skills and critical thinking. From the results of the article search, it was found that 39 articles used Problem Based Learning or PBL as their learning model and the ability to solve problems and think critically as the dependent variable.

3. Result and Discussion

3.1. Result

Based on the analysis results from international journals which are used as sources of literature in this study, the results of each of these articles can be detailed. For more details, see the table below:

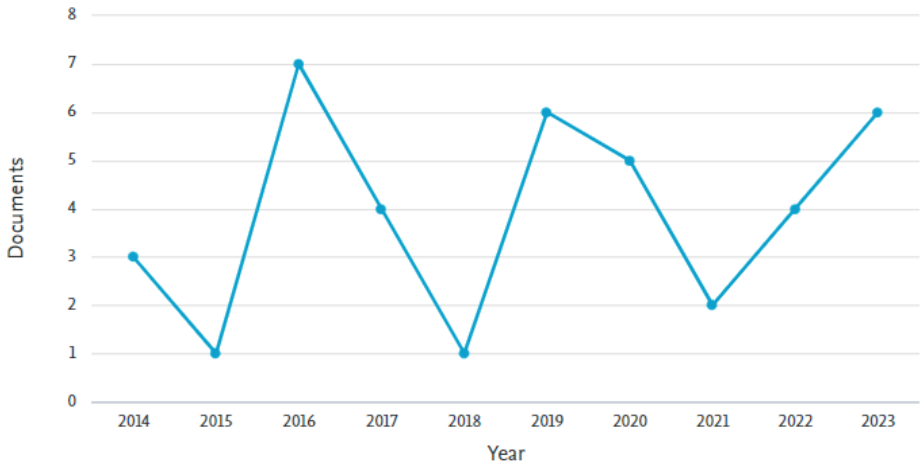

Figure 1: Number of Articles from 2014 to 2023.

Figure 1 depicts that there are 39 articles distributed from 2014 to 2023. The highest number of articles was in 2016, followed by 2019 and 2023. However, in 2023, there is a possibility of further increase in the number of published articles. Additionally, the authors from various countries can also be observed in Figure 2.

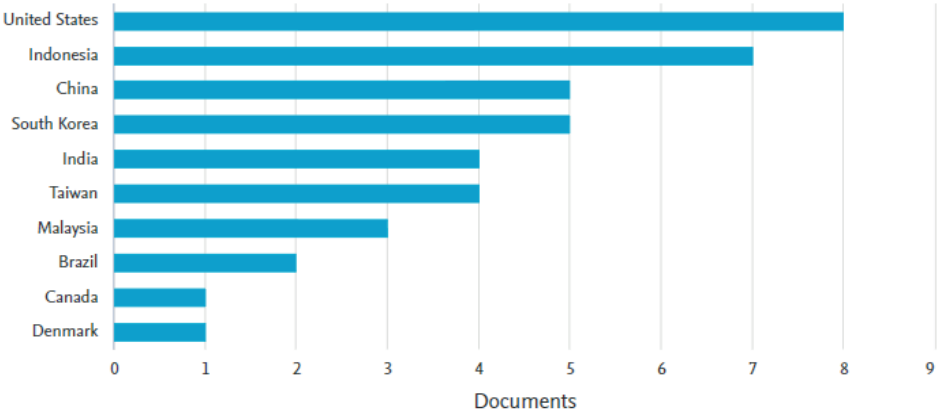

Figure 2: Articles by Country.

Figure 2 illustrates that articles according to the country with the highest contribution are from the United States. Following that are Indonesia, China, South Korea, India, Taiwan, Malaysia, Brazil, Canada, and Denmark. Furthermore, it can also be observed from the articles by subject area.

Figurw 3 shows that the field of knowledge with the highest number of articles is social sciences (24 percent). It is followed by various studies such as: engineering, computer science, physics and astronomy, nursing, materials science, mathematics, art and humanities, environmental science, medicine, and others.

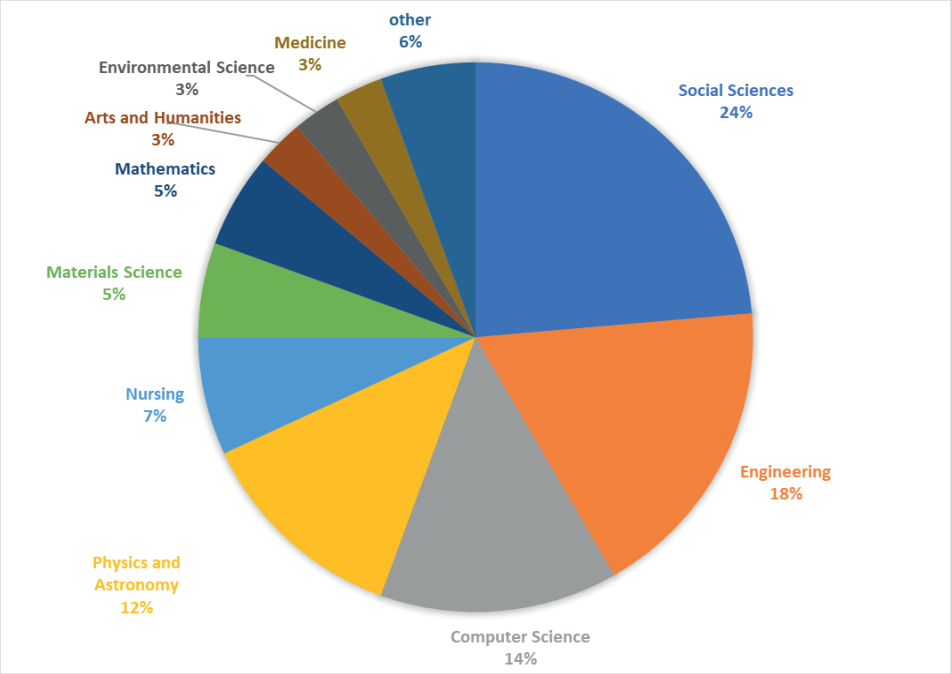

Figure 3: article by subject area.

3.2. Discussion

Based on data and information from the article on the topic of Problem-Based Learning (PBL) models, students' problem-solving and critical thinking abilities can be enhanced. The PBL model assesses students' ability to solve problems in both conventional and other forms of learning [13]–[16]. In this type of learning, students are expected to deepen their knowledge by observing real-world phenomena and conducting in-depth analyses to solve the issues presented [17]–[21] .

When students encounter real-world problems, teachers are expected to provide opportunities for students to discuss the problems in class, explain the challenges they're facing, make decisions about the problems, defend their opinions, appreciate the perspectives of their peers, and thereby develop ideas for problem-solving [6]–[10], [22]–[24].

The analyzed article agrees that the PBL model is highly effective when implemented by schools to motivate and enhance students' self-directed learning abilities [11], [25]–[30] [12], [31], [40]–[43], [32]–[39]. Additionally, students feel valued and empowered to contribute to resolving the issues they encounter. As a result, various countries are innovating their ideal learning approaches to implement the PBL model effectively and efficiently [11], [25]–[30].

Further research is encouraged to specifically examine different countries across classifications such as developed, developing, and economically disadvantaged nations. This will provide insights into learning approaches that offer effective and efficient solutions within the diverse educational contexts of various countries.

4. Conclusion

Based on the results of the discussion, it can be concluded that the Problem Based Learning (PBL) learning model can improve students' problem solving abilities and critical thinking. This can be seen from the 39 articles reviewed, information is obtained that the PBL model is an effective learning model used to improve students' problem-solving skills and critical thinking.

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