

Enhancing the Problem-Based Learning Model Assisted by Domino Media to Improve Critical Thinking in IPAS Learning for Grade IV Students of Margoyasan State Elementary School in the Academic Year 2022/2023

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1. Abstract

A significant number of students have obtained unsatisfactory learning outcomes. This issue can be attributed to the inadequacy of students' critical thinking skills in effectively solving problems during the learning process. The purpose of this research is to analyze the implementation of the Problem-Based Learning teaching model in enhancing critical thinking among fourth-grade elementary school students, with the assistance of domino media, at SDN Margoyasan, Yogyakarta. The research method employed in this research is Collaborative Classroom Action Research (CCAR) using the Kemmis and McTaggart model, conducted in two cycles. The subjects of the research were 25 fourth-grade students. This research was carried out during the second semester of the academic year 2022/2023. Data collection was conducted through observation, interviews, and documentation. The data analysis techniques employed were both qualitative and quantitative. The gathered data was further processed using quantitative methods. Based on the analysis of the implementation of the Problem-Based Learning teaching model in the learning process, it is evident that it can enhance students' critical thinking. Starting from the pre-cycle phase to cycle 2, the average critical thinking dimension of students improved significantly. Initially, in the pre-cycle, it was 45.8%, then in cycle I, it increased to 70.7%, and in cycle II, it reached 85.6%. The utilization of Problem-Based Learning assisted by domino media has a significant impact on students' critical thinking abilities. Moreover, it is noteworthy that the participants exhibit varied experiences in the learning process, owing to the demand for problem-solving during their educational journey. As a result, the research's implications are anticipated to motivate

educators to adopt this instructional model in their teaching practices. Thereby augmenting the students' proficiency in comprehending the subject matter effortlessly throughout the learning process.

Keywords: *Critical Thinking, Problem-Based Learning, Domino Media*

2. Introduction

The National Education Standards Agency (2006) states that the aim of basic education is to establish the foundation of intelligence, knowledge, personality, noble character, and skills for independent living and pursuing further education. In this context, it means that the educational process culminates in the formation of attitudes, the development of intelligence or intellect, and the enhancement of students' skills according to their abilities and needs. These three aspects (attitudes, intelligence, and skills) are the directions and objectives of education that need to be pursued. The Ministry of Education and Culture (Kemendikbud) has initiated an Education revolution since 2019, encompassing primary, secondary, and higher education, which adopts the concept of "Merdeka Belajar" (independent learning). "Merdeka Belajar" provides students with the freedom to choose various learning resources and is free from pressure. However, it seems that the implementation of the "Merdeka Belajar" concept has not yet achieved the intended goals.

The implementation of the "Merdeka Belajar" concept is a significant breakthrough in the Indonesian education system, designed by the Minister of Education, Culture, Research, and Technology of the Republic of Indonesia, Nadiem Anwar Makariem. This policy aims to enhance the competence of graduates by improving both soft skills and hard skills. The freedom of thought is the primary reference inherent in the concept of "Merdeka Belajar" (independent learning). The learning process should be humanistic and within a socio-cultural framework that enables students to think

critically. Moreover, graduates are expected to make significant contributions to the nation by becoming excellent and noble leaders of the future.

The concept of "Merdeka Belajar" aims to enable students to adapt in understanding the material, solve problems according to their abilities, similar to playing a game where they can level up quickly by tackling challenges. It shifts away from a one-size-fits-all approach to students' abilities. "Merdeka Belajar" also encourages students to apply the skills they have learned in various situations. The Pancasila Student Profile is a manifestation of preparing the next generation of the nation to be capable and competent in facing the changes of the times while upholding Pancasila values. In addition, the formulation of the Pancasila Student Profile within the scope of policy includes aspects of student learning, teacher learning and competencies, and educational leadership. Essentially, this policy focuses on primary education units, encouraging the implementation of abstract Pancasila values to become more concrete and measurable. The Pancasila Student Profile represents an innovation in the national education system through the independent curriculum, aiming to improve the quality of education by prioritizing character education within it.

Critical thinking is one of the constituent characteristics of the Pancasila Student Profile. Cultivating critical thinking is crucial for every student. Critical thinking is highly needed by students when solving problems (Ernawati & Rahmawati, 2022). Learning independence and critical thinking skills are essential competencies expected to embody the Pancasila student profile. As the owners of the learning scenarios, teachers play a central role in fostering and developing these competencies. The Pancasila student profile serves as a guideline for educators, especially teachers, to build the character of the nation's children within the school context, particularly in the classroom. (Juraidah & Hartoyo, 2022) As it is implemented in the field, strengthening the profile of Pancasila

students is not only achieved through the Pancasila student profile strengthening project but can also be accomplished in day-to-day learning activities by adhering to the values of the Pancasila student profile itself. Learning activities in each subject can be designed to support the development of the Pancasila profile in a daily and sustainable manner. In this regard, the implementation can be carried out by applying various approaches such as project-based learning, problem-based learning, task-based learning (Tustiawati & Putri, 2022).

Problem-solving or presenting arguments in reasoning is essential in honing students' critical thinking skills. To develop students' critical thinking abilities, appropriate supporting tools are needed, and one of them is using Domino Cards with various problem sets. The use of Domino Cards is expected to cultivate and enhance students' creativity and enthusiasm in an enjoyable learning process, as students can learn while playing. Based on the research findings of Aprinawati (2017), the use of domino cards as a teaching aid resulted in an improvement in both teacher and student activities during each class meeting in the teaching and learning process, leading to enhanced learning outcomes for students. According to Nurfitriyanti & Lestari (2016), the presence of domino cards also made students more proficient in understanding the material as they became accustomed and trained to comprehend the questions on the cards. This teaching aid can stimulate students' creativity in arranging domino layouts and train their strategies in the game to achieve victory in each provided round.

Based on the research conducted by Nurfitriyanti & Lestari (2016), the use of Domino Cards has its own attractiveness in learning, making students interested and easily receptive to understand and comprehend the subject matter being taught. Students enjoy the process without realizing that they are actually learning; it feels like

playing, but in essence, they are learning. The research findings of Rahaju & Hartono (2017) indicate that the use of domino cards can enhance students' critical thinking abilities. The solution to address this issue is by implementing a teaching model. One of the teaching models that can be applied is the Problem-Based Learning (PBL) model. The intended Problem-Based Learning teaching model is a learning and teaching process that presents problems to students, expecting them, as the learning subjects, to solve the problems provided by the teacher through active learning activities, with the teacher serving merely as a facilitator (Utama & Kristin, 2020). One of the instructional models that can be used to support innovative learning is Problem-Based Learning. A teaching model that teachers can employ is Problem-Based Learning (PBL). This model stimulates students to solve problems presented by the teacher (Kristiana & Radia, 2021; Saidah et al., 2014). Problem-Based Learning is an approach that utilizes real-world problems as a context to stimulate students' critical thinking and problem-solving abilities in understanding the essential concepts and principles of a subject (D. Utami, 2019). In the concept of PBL, learning can be achieved when the learning process centers around tasks or problems as the focal point of instruction. Students are encouraged to seek the necessary information to solve these problems by identifying the central issues to develop an understanding of various underlying concepts related to the given problem, as well as other relevant principles of knowledge (Prasetyo, 2018).

Several previous research findings indicate that the problem-based learning teaching model can stimulate critical thinking abilities through problem-based learning processes (Stephani, 2017). Problem-Based Learning (PBL) teaching model can enhance critical thinking skills and IPAS learning (Sari et al., 2019). Furthermore,

the Problem-Based Learning model has a significant impact on improving students' critical thinking (Utama & Kristin, 2020). The process of critical thinking in a forum is crucial. Therefore, critical thinking often becomes a primary goal and outcome of an educational process. Based on previous studies, this research opted for a meta-analysis approach using relevant existing research sources to determine the impact of implementing Problem-Based Learning on enhancing critical thinking among elementary school students. The objective of this research is to analyze the implementation of problem-based learning in fostering critical thinking among elementary school students.

Based on the description above, the researcher intends to conduct a classroom action research with the title: "Enhancing the Problem-Based Learning Model Assisted by Domino Media to Improve Critical Thinking in IPAS Learning for Grade IV Students of Margoyasan State Elementary School in the Academic Year 2022/2023." This classroom action research aims to determine the ability "Improving Critical Thinking Skills through Domino Media in IPAS Learning for Grade IV Students of Margoyasan State Elementary School."

3. Methods

3.1. Participants and context

This research is a Collaborative Classroom Action Research (CCAR). Collaborative classroom action research uses the Kemmis and McTaggart model. The research procedure involves a cycle of activities that will be conducted over two cycles, each consisting of two meetings. According to Arikunto (2013: 132), there are four stages utilized, including planning, action, observation, and reflection. The research subjects

are fourth-grade students, comprising 25 students, with 19 male students and 6 female students. The research was conducted in the second semester of the academic year 2022/2023. The research process, from data collection to reporting the research results, took approximately two months, from May 2023 to June 2023.

3.2. Material

The data collection techniques employed in this research were observation, interviews, and documentation. The data gathered through the observation method comprised the students' learning activities during the teaching and the implementation of actions carried out by the teacher while using the Problem Based Learning (PBL) model assisted by Domino Media.

3.3. Data Collection and analysis

There are two types of data analysis used, namely quantitative and qualitative data analysis. This research refers to the interactive analysis model according to Miles and Huberman (in Sugiyono, 2015:338), which involves four stages: data collection, data reduction, data presentation, and conclusion drawing. The research can be considered successful as the implementation of the PBL model assisted by domino media was able to increase the critical thinking dimension in Mathematics for fourth-grade students, ultimately reaching 82%. This indicates an improvement in students' critical thinking dimension.

4. Results and Discussion

Results

Based on the observation results, the critical thinking dimension of the students has shown improvement from the pre-cycle, cycle 1, and cycle 2 as presented in Table 1.

Table 1. Critical Thinking Dimension Data Analysis.

Cycle	Critical Thinking Dimension.
Pre-Cycle	45,80%
Cycle 1	70,70%
Cycle 2	85,60%

Based on the table above, it can be observed that students' critical thinking dimensions in the pre-cycle show an average of 45.8%, which falls within the low qualification category. The percentage score of 45.8% falls within the percentage interval of 25% - 49%, indicating a low qualification level. In cycle 1, there is an improvement compared to the pre-cycle, reaching 70.70% in the moderate category falling within the interval of 50% - 74%. Furthermore, in cycle 2, there is a further increase to 85.6% in the high qualification category falling within the interval of 75% - 100%.

Graph 1. Critical Thinking Dimension Data Analysis.



In graph 1, a comparison of the percentage and the increase in the percentage of students' critical thinking dimensions can be observed from the pre-cycle phase to cycle 2. In the pre-cycle to cycle 1 phase, there is a 24.90% increase in the percentage, and from cycle 1 to cycle 2, there is a 14.90% increase in the percentage.

Discussion

In Cycle I, there are four stages of activities carried out: planning, action implementation, observation, and reflection. The planning stage involves preparing the learning tools such as Lesson Plans (RPP), Student Worksheets (LKPD), and learning scenarios for each cycle. It also involves creating observation sheets for student and teacher activities, preparing domino media, as well as learning materials and equipment. Additionally, forming four student groups and creating test questions along with their answers are part of this planning stage.

The stages of implementing the activities are carried out by applying the activities outlined in the Lesson Plan (RPP), starting with the preliminary activities, core activities, and closing activities. During the preliminary activities, the researcher initiates the learning process by giving greetings, taking attendance of the participating students, conveying the competencies that the students must achieve after the learning session, and conducting an aperçu by using domino media containing questions and answers. The domino activity is played in groups, and then the students work on the Student Worksheets (LKPD) and present their understanding of distinguishing between needs and wants in daily life.

In the core activity, the researcher initiates the learning material by directing students to understand the issues related to needs and desires in daily life. Subsequently, the students are asked to investigate ways to address these issues through conducting simple

experiments. The practical activities carried out by the students are documented in the student worksheets (LKPD) provided by the researcher. Through group discussions, the students are given the opportunity to analyze the needs and desires in daily life and answer the questions provided in the LKPD. Furthermore, the students are given the opportunity to verify their findings by referring to various relevant sources of information about needs and desires in daily life, and they present their work in front of the class. After the students finish their presentations, the researcher concludes the learning session by clarifying the concepts from the material presented by the students as a conclusion of the material they have learned. In the closing activity, during the learning process in the closing session, the researcher provides five essay questions and multiple-choice questions.

Cycle II Planning stage is based on the reflection results from cycle I, the author made improvements to the preparation of Lesson Plans (RPP) in the second cycle by optimizing the time for the opening, allocation of time for data processing, and student presentations. Additionally, the researcher better prepared the tools and materials for the play and learning activities to make them more effective and efficient.

The implementation stage of the action is carried out through: introductory, core, and closing activities. The introductory activity in cycle II is not significantly different from the activity in cycle I. There is a change in the time allocation for the introductory activity, which was initially 15 minutes to optimize the use of time.

In the core activity, the researcher initiates the learning material by guiding students to understand the concept of differentiating rules at home and school using the domino media. The researcher asks the students to analyze the problem and then conduct an investigation through group discussions until a winner is identified.

The activities of playing with the domino media carried out by the students are documented in the student worksheets (LKPD) provided by the researcher. In the following activity, students are given the opportunity to discuss the experiment results with their groupmates, verify data through various sources, and present their findings in front of the class. The researcher concludes the learning session by clarifying the concepts from the material presented by the students as a conclusion.

In the closing activity, during the learning process in the closing session, the researcher provided multiple-choice questions and 5 essay questions on the topic of differentiating rules at home and school.

Based on the above description, it can be understood that implementing the PBL model and using the Domino learning media can enhance the attractiveness and interest of students in learning IPAS, thereby improving students' critical thinking in differentiating rules at home and school. The use of domino media in teaching and learning activities captivates students and enables them to concentrate for a longer time, facilitating the absorption of information provided by the teacher, thus enhancing critical thinking. This is further supported by the research findings of Musfiquon (2012), which state that learning using play-based media has proven to be more effective and efficient in enhancing students' critical thinking. The domino media is classified as a type of media that includes visual elements besides images. This facilitates students in comprehending abstract materials and making them more tangible. The use of domino media can enhance the enthusiasm for learning because it presents complex material in a simple manner, aligning with the students' level of thinking.

In line with that, Ahyar et al. (2014) stated that media has advantages, namely its ability to help students depict complex subjects because it is equipped with images,

photos, charts, diagrams, animations, videos, and other visual aids. Complicated material can be explained in a simple manner, tailored to the students' level of thinking, accompanied by simple experiments that students can conduct on their own, making it easier to comprehend. In line with that, Grzeszczyk (2016) stated that the domino media is a program that allows interaction between the media and users, enabling the creation of various activities, ranging from interactive learning, interactive quizzes, and even games. The domino media can be used in a presentation, but the program also has facilities for creating interactive learning.

Student-centered learning is expected to enhance students' engagement, responsibility, and initiative in recognizing their learning needs. This is supported by Cahyaningsih et al. (2020), who found that the implementation of the PBL learning model using the domino learning media can increase learning activity and learning outcomes of 4th-grade students at SD Negeri Margoyasan.

The implementation of the PBL model makes students active in learning and motivated because throughout the process, students are guided to construct knowledge in the form of concepts, enabling them to solve problems that arise in everyday life. This is also in line with the use of the domino media, which can attract the interest of students in learning because they are presented with real-life phenomena that occur in daily life and are presented in an engaging manner, making students reluctant to miss what is presented in the domino game. This is supported by Ramayani (2019), who stated that the use of domino media and the PBL model significantly improves students' learning outcomes (Busra, 2015).

5. Conclusion

Based on the research results, it can be concluded that the use of the Problem Based Learning model assisted by the domino media can enhance the critical thinking dimension of the IPAS content. This is evident from the improvement in students' critical thinking dimension, starting from the pre-cycle stage to cycle 2. Initially, the average critical thinking dimension of students in the pre-cycle was 45.8%, then it increased to 70.7% in cycle 1, and further to 85.6% in cycle 2. On average, the critical thinking dimension of students in the class increased by 42%. The percentage comparison and percentage increase of students' critical thinking dimension can be observed from the pre-cycle stage to cycle 2. In the pre-cycle stage towards cycle 1, there was a 24.90% increase in percentage, and from cycle 1 to cycle 2, there was a 14.90% increase in percentage.

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