

## Problem-Oriented Student Worksheet based Learning: Cultivating Creativity in Primary School Students

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### Abstract

Education today is geared towards developing 21st-century skills. One of the skills that needs to be developed is creativity. The objectives of this research are: (1) to describe the use of problem-based learning-oriented student worksheets for grade 4 students at Kasinoman 3 State Elementary School; and (2) to explore the cultivation of creativity in grade 4 students at Kasinoman 3 Elementary School. The general type of research is research and development. Meanwhile, the type of research in this article is ethnographic qualitative research. This research was conducted at Kasinoman 3 Elementary School in August 2023. The subjects of this research were 11 fourth-grade students. Data collection techniques are carried out through observation, interviews, and documentation. The credibility test is used to test the validity of the data obtained. The data analysis technique was carried out using the Allure method. The results of the research show that the use of student worksheets oriented towards problem-based learning.

### Introduction

Empowerment of human resources can be achieved through education. In the 21st century, a country's quality of life can be influenced by aspects of its education (Supriatna, 2020). To prepare human resources who master 21st century skills, this will be successful if integrated into education. An important skill to develop is creativity (Widiyanti & Nisa, 2021). Educators have a responsibility to develop the creativity of their students. (Manobe & Wardani, 2018), says that creativity is a person's ability to produce something new and different from what already exists, whether in the form of ideas or real work. Creativity is the ability to identify new relationships among existing elements and produce new solutions to a problem (Zakiah et al., 2020).

Creativity is a competency that needs to be developed by educators. According to (L. Brown, 2019), teachers are responsible for developing elementary school students' creativity in learning methods. One of the teaching methods that can be applied to develop student creativity is by using problem-based learning-oriented student worksheets. (Rahmayanti, 2017). This sheet is a guide sheet that is used in learning activities, such as investigation and problem solving, and can contain material and summaries, as well as assignment and assessment instructions (Rahayu & Budiyo, 2018).

It is very important for students to use worksheets, especially in subjects that require practice or experimentation, such as mathematics. Problem-based learning-oriented student worksheets can stimulate students' creativity to find solutions to a phenomenon they encounter in real life. According to (Johnson, 2019), in elementary school learning, student worksheets oriented towards problem-based learning can stimulate student involvement, increase understanding of concepts, foster creativity, and increase critical thinking skills. Something similar was also said by (J. S. Brown, 2018) using problem-based learning-oriented student worksheets can increase elementary school students' creativity by providing opportunities for divergent thinking, developing creative solutions, and collaborating with classmates.

Nurturing the creativity of elementary school students has been done a lot before. The results of previous research regarding efforts to increase creativity using the problem-based learning approach have been widely carried out (Muhayani & Fatmariza, 2022); (Handayani & Koeswanti, 2021); (Nahar et al., 2022). Apart from that, the results of previous research tested the effectiveness of the problem-based learning approach by using student worksheets in mathematics learning (Swiyadnya et al., 2021).

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There is also research that develops student worksheets using the problem-based learning approach (Risfadilah, 2019). However, based on these studies, there are still very few who have developed student worksheets oriented towards problem-based learning for grade 4 elementary school mathematics material, especially in the chapter on the perimeter and area of simple flat shapes. This is important to study in more depth because creativity needs to be developed so that student motivation and learning outcomes can also increase (Johnson, 2017).

The results of research conducted by the author on observation and interview activities showed that student creativity was still low. Mathematics learning carried out by teachers has not run optimally and still often uses classical methods, such as lectures, in delivering teaching material (Anjarsari et al., 2020). Therefore, a method is needed to foster student creativity. The way this can be done is through a series of learning activities using problem-based learning-oriented student worksheets that are carried out collaboratively, communicatively, and cooperatively (Lestari et al., 2021). A student worksheet designed on a problem-based basis allows students to see, experience, and obtain information in the form of writing, illustrations, or learning activities. This will encourage students to construct knowledge through the experiences they have had (Effendi et al., 2021).

There are two research objectives in this article. First, explain the use of problem-based learning-oriented student worksheets for grade 4 students at Kasinoman 3 Elementary School. Second, explore the cultivation of creativity in grade 4 students at Kasinoman 3 Elementary School.

## Methods

The type of research used overall is research and development. Research and development is a previous product development process that can be accounted for in terms of performance, effectiveness, and robustness (Sutama, 2019). The type of research in this article is qualitative research with an ethnographic approach. According to (Mekarisce, 2020), qualitative research involves exploring and interpreting behaviors observed in individuals or groups to address societal or human-related issues.

Qualitative research more attention is paid to how and why questions. According to (Fiantika et al., 2022), qualitative research is a type of research with the aim of gaining an understanding of what happens to the research subject, such as actions, behavior, motivation, perception, and other things, which are described through sentences and natural language and using various available scientific methods.

This qualitative research is descriptive in nature and frequently involves analysis. In qualitative research, what is usually highlighted is the perspective of the research subject, process, and meaning of the research based on existing theory to support it so that it is the same as existing facts. Researchers have a role as key instruments in this research (Sutama et al., 2019). An ethnographic approach focuses on studying specific groups. According to (Sutama et al., 2022), this approach will be carried out through direct observation and interaction with the group that is the research subject.

Study carried out at Kasinoman 3 Elementary School. The location of the school is in Krompyong Hamlet, Kasinoman Village, Kalibening District, Banjarnegara Regency, Central Java, in August 2023. The research subjects used were 11 students in class 4 at Kasinoman State Elementary School 3. This research focuses on student creativity shown through student behavior when mathematics learning is taking place. The material used is material regarding the perimeter and area of simple flat shapes.

Data collection technique used are observation, interviews, and documentation. Observation is direct observation by researchers in the field to be able to see more closely the activities being carried out by research subjects (Lubis et al., 2022). Observation, as noted by (Syukri et al., 2019), is a technique researchers utilize to directly observe various activities during research. An interview involves a two-way conversation between two parties, the interviewer and the source, conducted for a specific purpose. It serves to collect the necessary information about the source (Agustina, 2019).

There are two activities or activities carried out in interview activities, namely oral interviews or question and answer activities carried out when interviewing sources, as well as written activities carried out when creating data or reports from the results of interviews conducted (Lubis, 2022). Interview techniques can be used to obtain subjective information or data from sources, which can be in the form of opinions, behaviors, attitudes, and other things related to the event or thing being researched (Hansen, 2020). Interview activities were carried out to support ongoing direct observations.

Validity of data is assessed through credibility testing, a method used to determine the accuracy and truthfulness of research findings obtained through qualitative analysis. The credibility of the existing research results will be assessed if the participant provides a statement that the transcript of the research results is truly the experience of the participant (Safitri et al., 2020).

Qualitative research has four stages of data analysis, starting with data reduction, followed by presenting data, verifying data, and drawing conclusions. Data reduction is sorting out the main things contained in various data as well as focusing on important data and eliminating data that is not used (Amaliah, 2020). Data presentation activities are activities of compiling various existing data or information so that it makes it easier to draw conclusions and take action (Rijali, 2018). Data verification

involves double-checking the accuracy of the collected data (Mawarni et al., 2023). Drawing conclusions involves generating new statements based on verified data (Taraka & Masyakristi, 2022).

## Result and Discussion

### *Utilization of Student Worksheets*

Problem-oriented learning will direct students to analyze and think critically about the problems they face (Widayanti, 2020). Students will later learn analytically and critically, collaborate in groups, solve problems, and use appropriate learning resources (Hotimah, 2020). The problems raised are related to everyday life (contextual). In this way, it will be easier for students to understand the material by solving problems using various sources (Fauzia, 2018).

When used, teachers can print the worksheets so that students can use them during learning. The stages that can be carried out in problem-based learning are: 1) giving students direction on the problem; 2) form groups; 3) carry out individual and group investigations; 4) analyze and convey the tasks being carried out; 5) analyze and evaluate the results (Amris & Desyandri, 2021).

The first stage is directing students to a problem. This stage is the initial stage of core learning activities. What is done is that the teacher conveys the learning objectives, conveys phenomena and stories that lead to a problem, poses problems, explains how to use worksheets, conveys the tools and materials needed, and motivates students to be active when learning activities are carried out. The problems raised by teachers are related to everyday life or are contextual in nature. This is because the problem-based learning method is a learning strategy that applies concrete problems that students often encounter (Amris & Desyandri, 2021). In this way, students will gain problem-solving skills, gain understanding, and have the ability to apply teaching materials to everyday life.

The second stage is organizing students. Students were divided heterogeneously into two study groups. This is in line with the opinion of (Rahayu, 2016), which states that problem-based learning is a learning process that systematically maximizes students' abilities through group work. Then, obey (Kristin, 2018) also stated that in learning, students are trained to solve concrete problems systematically through group work. So, learning will be more optimal if students work together in groups. Teachers can also direct students to determine and divide learning tasks into groups.



**Figure 1.** Students are Divided Into Two Groups

The third stage, namely carrying out an investigation. At this stage, students investigate problems individually and in groups. Meanwhile, teachers have the responsibility to encourage students to carry out investigations and obtain explanations from problem-solving activities. The problem-based learning method can train students to actively find the information needed in the learning process. This is confirmed by (Ramadhani, 2021), who states that in problem-based learning, students are encouraged to explore the information needed to find solutions to the problems posed. In this way, students will be encouraged to be creative in finding solutions to the problems they face.

The next stage is developing and presenting the results. Students analyze the data that has been obtained and prepare everything to convey the results of the students' worksheet work. Meanwhile, teachers can direct students to prepare and plan reports, as well as direct students to divide tasks with their group friends. During this process, student creativity will emerge through the behaviors they demonstrate, such as being proactive in solving problems, understanding a concept or definition, interacting in groups, and sharing opinions (Vera et al., 2019). In this way, collaborative, communicative, and cooperative learning will be created.



**Figure 2.** Students are Actively Involved in Group Activities

The final stage is analyzing and evaluating the results. Students present the results of the problem-solving that has been done. Each group presents its results, while the other groups pay attention and provide opinions, questions, suggestions, and criticism. This process also becomes a forum for all students to exchange opinions regarding the results of problem solving. The teacher's job is to guide the discussion so that it can run smoothly. The teacher also invites students to self-reflect and conduct an evaluation of the process and results of the investigation of what has been done. In this way, teachers can obtain information about and the results of learning activities that have been carried out (Hotimah, 2020). So, teachers can use it as a reference or evaluation material for subsequent learning.



**Figure 3.** Students Present Their Results to Each Other Provide Opinions and Responses

The learning carried out is more student-oriented. Meanwhile, the teacher has a role as a facilitator and provides motivation. So, students become enthusiastic about problem-solving activities (Hagi & Mawardi, 2021). Learning activities can encourage students to act creatively by allowing them to express their opinions and create work that suits their creativity (Firdaus et al., 2021). Thus, the learning activities carried out can develop students' creativity. Especially in mathematical content, which can then be implemented in real life.

### ***Cultivating Elementary School Students' Creativity***

The results of the initial research conducted by the author show that the learning carried out was not optimal. This can certainly hinder the growth of students' creativity, which is one of the important competencies to be developed. The fact that students' thinking competence is very important encourages teachers and educators to try to increase students' creativity (Hutasuhut, 2019). Mathematics learning still pays attention to problem-solving abilities in its implementation (Yustianingsih et al., 2017). In this case, teachers can overcome this problem by using problem-based, learning-oriented student worksheets.

The results of research before cultivating creativity showed that only a few students showed creativity during learning, namely only 3 students out of a total of 11 students. This creativity is evident in student behavior, such as their willingness to express opinions both orally and in writing. The student is also able to conclude the results of the learning activities that have been carried out. This is in line with Halpern's statement in (Febrianingsih, 2022) that creativity is a cognitive process or act of

thinking to produce creative and innovative ideas. Thus, these three students have shown creativity through their behavior during learning.

In contrast, the other 8 students did not exhibit creative behavior during learning. This happens because teachers carry out monotonous learning so that other students are not encouraged by their creativity. Students tend to receive one-way information from teachers and are less involved in constructing their own knowledge (Hutagalung, 2017). This is the cause of the weakening of students' mathematical creativity, which can also have an impact on their learning outcomes (Siregar et al., 2020).

The cultivation of creativity is carried out at all stages of learning, starting with preliminary activities, core activities, and closing activities. Generally, preliminary activities involve conditioning students, conducting apperception, and conveying motivation (Julaiha, 2014). Preliminary activities begin with conditioning the students. What students do is answer the teacher's greetings and pray together, led by one of the students. Each student will take turns leading prayer each day. The goal is that student participation and self-confidence can also increase (Hotimah, 2020). Next, students receive attention from the teacher. Teachers can connect material that students have previously studied with new material so that students have an idea of the material. Then, students will be given an explanation of the benefits of studying the material, the learning objectives, and the learning activities that will be carried out.

The next activity is the core learning activity. The core activities are carried out in accordance with the syntax of problem-based learning, namely: 1) directing students to a problem; 2) divide students into several groups; 3) carry out investigations individually and in groups; 4) analyze the work done; 5) Evaluate the results (Hotimah, 2020). Overall, core activities contain two main activities carried out by students, namely concept development and problem solving. Students are asked to find definitions and formulas for the perimeter and area of simple flat shapes through activities on student worksheets, both individually and in groups. This activity can develop students' creativity in solving problems through the behavior shown during the activity.

The last activity carried out was the closing activity. The stages carried out are that students and the teacher conclude the learning and ask each other questions about the topics they have studied. The next stage is reflection. The teacher asks students about their impressions after following the lesson, confirms with them whether the material can be understood, and provides solutions if there are students who do not understand the material. Next, students are asked to work on questions to test their ability to master the material they have studied. Furthermore, students receive feedback and follow-up information from the teacher. The information conveyed includes enrichment and remedial plans, as well as information for subsequent learning. The activity continued by inviting students to appreciate themselves for all the efforts they had made during the learning process and ended with closing greetings from the teacher.

After cultivating creativity, significant changes occurred. There was improvement after using the developed worksheet. The number of students who showed creative behavior increased to nine. This happens because the worksheets used can encourage student creativity. This behavior can be seen during learning: students become more active, dare to express their opinions in writing or verbally, work together and collaborate with their group friends, and can draw conclusions from what they have done. This shows that problem-based learning-oriented student worksheets are effectively used to develop student creativity because they are a learning approach based on the constructivist paradigm, which focuses on the student learning process (Mayasari et al., 2022).

## Conclusions

The use of the lecture method in mathematics learning is less effective. There is a need to develop learning methods that can foster student creativity. One of them is by developing teaching materials in the form of problem-based learning-oriented student worksheets so that they are able to require students to solve problems with creative thinking. This method is effective in honing students' creativity in learning mathematics. In its use, the teacher only plays a role in helping and encouraging students during the learning process. That way, students will be encouraged to be creative through the learning activities contained in the worksheet.

Initial research results show that there are still a few students who have creativity when learning, namely 3 students out of a total of 11 students. This can be observed directly during learning through the behavior shown. Subsequently, stage 2 is implemented after cultivating creativity using developed worksheets. At this stage, there was an increase in the number of students who showed their creativity during learning, namely 9 students. This indicates that student worksheets with a problem-based approach can develop the creativity of grade 4 elementary school students, especially when dealing with the topic of perimeter and area of simple flat shapes.

## Acknowledgement

We would like to thank the Dean of the Faculty of Teacher Training and Education and the Primary School Teacher Education Study Program for the research permission that has been granted. We would also like to express our thanks to the principal, teachers, and students of Kasinoman State Elementary School 3, who have given permission and helped with research activities so that they could be carried out smoothly.

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