How Do Primary Teachers Develop Students' Problem-Solving Skills to Construct Environmental Concepts?

M Somantri1,2* , A Abdul karim1, D Disman1 K Komalasari1 and N Hermita3,4

1Program Studi Pendidikan IPS, Universitas Pendidikan Indonesia, Jl. Dr. Setiabudhi No. 229 Bandung 40154, Indonesia  
2Program Studi Pendidikan Guru Sekolah Dasar, STKIP Purwakarta, Jl. Veteran No 54 Purwakarta 54324, Indonesia  
3Program Studi PGSD, Universitas Riau, Pekanbaru 28293, Indonesia  
4Program Studi Pendidikan IPA, Universitas Riau, Pekanbaru 28293, Indonesia  

*Corresponding Author: mubaroksomantri@upi.edu

Abstract. The purpose of this study is to describe the skills of teachers to develop the problem-solving skills of elementary school students in grade V. One of the competencies is very important possessed by teachers, teachers must have the skills to optimize the problem-solving skills of students from an early age, so students are able to solve all the problems he faces. awakenning the domain of another learners' development. The design of this type of research is descriptive-quantitative, data netted through observation and interview instruments to collect data from two elementary school teachers in Bandung, Indonesia. The results showed that the development of problem-solving skills in the concept of the environment in primary school grade V was not optimal. That was caused, the skills of teachers in designing learning that can stimulate students' problem-solving skills on environmental concepts is still low. These findings can provide information to academics and policymakers to create solutions to improve the skills of teachers in designing 21st-century learning, especially problem-solving learning.

1. Introduction

The skills to solve problems is one of the students’ skills must-have in the 21st century [1]; [2]; [3]; [4] and [5]. Development of these skills is one of the tasks of the teacher in the class, how teachers develop these skills in learning. One of the competencies that teachers must possess is the skills to design 21st century-oriented learning skills [3] and [6]. Based on the results of research conducted by [7] and [3] the results show that the learning process in several regions in Indonesia has not yet been carried out effectively in problem-solving skills in students, this is because there are still many students who have not yet achieved mastery of learning, optimal. One factor that influences this is the skills of teachers to design meaningful learning [3]; [8]; [9] and [10].

Some of the results of the international study, the skills of Indonesia’s learners always under the other participant countries. The type of the questions that were on survey questions was a Higher Order Thinking Skills (HOTS), one of the learners must be able to understand the problem, resolve problems, and provide solutions, or answers to the questions that given [11]; [12] [13]; [14] and [4].
One of the concepts of the material which is given in elementary school that requires the skills to think, analyze and solve problems is the concept of the environment. As we know environmental issues became one of the world's problems requires the participation of all beings on this earth, including upfront learners as the next generation of the nation [15]; [16]; [17] and [18].

This environmental concept is considered one of the concepts that are easily taught in class to students. In reality, the students, however, have not been able to do an analysis and understand the environmental problems that occur around them. This proves that teachers and students only master the concepts without understanding the environmental concepts themselves [15] and [18].

2. Methodology

2.1 Types of Research

The research methods used in this research is the quantitative descriptive method. This research aims to disclose and describe a situation that exists with the use of numbers and descriptions [19]. The process of processing and analyzing data uses a quantitative approach (RPP observation) and descriptive (observation of learning and interviews). The instruments used in this study were observation and interviews. Participants in this study were two grade V elementary school teachers in the city of Bandung, West Java, Indonesia.

2.2 Research Instruments and Data Analysis and Processing

Observation sheet is done during the learning process in class, this is to see how the teacher teaches and stimulates students' problem-solving skills through various activities namely understanding problems, solving problems and answering problems. While the interviews were given after the data from observations were taken and analyzed, interviews were conducted to verify the findings during the observation of learning [20]. This interview was conducted for two elementary school class V teachers, one female, one male, female teachers from the Sundanese tribe, while male teachers came from the Malay ethnic group. Both participants are graduates of elementary school teacher education study programs. The participants were chosen purposively with the criteria that they have teaching experience of more than five years and they have been certified. The primary schools that were used as the research were selected because they were accredited and were those who agreed to participate in this research. The results of this interview were processed and analyzed through a descriptive approach [20].

2.3. Ethical Issues

Before conducting research, the researcher submits a research license and makes a written agreement related to the research objectives, both preparation, implementation and evaluation processes, and the researcher disseminates the method used. The teacher agreed to join the study without any element of coercion and pressure. Besides, the names of our teachers and schools are kept the secret to protect the identities of teachers and schools [21].

3. Result and Discussion

This study illustrates the skills of teachers in designing learning that is able to stimulate problem-solving skills to resolve environmental problems. Based on the results obtained in the observation data that teachers in both elementary schools are equally taught the concept of the environment, but each teacher has a different way of delivering it to the learners. The teacher of elementary school A teaches the environment by using PowerPoint media, teacher conveys the concept of the environment by providing knowledge of what the environment is, environmental characteristics, problems in the environment and how to overcome these problems, while students are only as passive listeners.
Students are not stimulated by their problem-solving skills through thinking questions, analyzing answers, and students are not given the opportunity to communicate their knowledge. So that students' problem-solving skills are not aroused. Even though through media the teacher can do learning in stimulating problem-solving skills through power points by providing a video or pictures related to the environment, environmental problems and so on, then let students understand the images, analyze problems, and provide solutions to environmental problems according to students' knowledge, then the teacher corrects the wrong concepts.

Whereas teacher of elementary school B teaches environment through lectures and discussions, the teacher conveys the concept of environment to learners, then learners discuss questions related to the environment that the teacher has prepared beforehand. Based on the results of the analysis of the questions that is discussed by students less stimulating the problem-solving skills of students, because the questions are still in the realm of Low Order Thinking (LOT), while in stimulating the problem-solving skills of students in need of the type of questions Higher Order Thinking Skills (HOTS). Yet through a discussion through stimulation of HOTS questions able to develop thinking power, communication skills, collaboration in analyzing problems and solving solutions so as to be able to hone students' problem-solving skills to the maximum.

More clearly, the activity of learning environmental concepts can be seen in Table 1, where the results show that the two teachers from two different elementary schools have not been maximized in stimulating students' problem-solving skills.

| Understand the problem | Teacher A | Teacher B |
|------------------------|-----------|-----------|
| The teacher tries to provide understanding to students through the delivery of material using PowerPoint media, the teacher has the belief that students can understand concepts quickly through the media because through black/whiteboard they are fewer stimulating students' attention. | The teacher teaches the environment so that students can understand it through lectures and discussions, according to teacher B through discussion students can understand the problem through questions discussed with their peers. |

| Solve the problem | Teacher A | Teacher B |
|-------------------|-----------|-----------|
| The teacher stimulates students' skills to solve problems through questions that the teacher asks spontaneously. In his opinion, this is done so that students actively speak in class. | The teacher stimulates the skills of students in solving problems through the questions given to be discussed in groups. In the teacher's opinion, the questions answered through discussion can stimulate passive learners to be actively expressing their opinions. |

| Answer problem | Teacher A | Teacher B |
|----------------|-----------|-----------|
| The teacher stimulates the skills to answer problems as well as solving problems through spontaneous answers put forward by students. The teacher also believes that spontaneous questions and answers from students are able to hone students' thinking skills as well. | The teacher stimulates the skills to answer the problems as well as both indicators i.e. through problem-solving of the questions discussed in the group. Teachers think through discussion with peers' learners will feel comfortable and open in their suggested. |
Based on the description in table 1, it is known that the teacher's goal in stimulating students' problem-solving skills is quite good, but in the process of making questions, media selection and learning models are less precise. One example is the questions either spontaneous or made by the teacher before learning is still in the realm of the LOT, but in stimulating students' problem-solving skills HOTS questions are needed. Furthermore, the selection of instructional media is good but the content in PowerPoint media is inaccurate, PowerPoint content is only available without videos or images that can stimulate students' thinking, analysis, and problem-solving skills. The teacher stimulates the skills to answer the problems as well as both indicators i.e. through problem-solving of the questions discussed in the group. Teachers think through discussion with peers’ learners will feel comfortable and open in their suggested.

Based on the results of the study above, observations of the skills of teachers in designing learning-oriented problem solving are at a low category this can be seen in Figure 1. below.

![Figure 1. Data of Teacher's Skills in Designing Problem-Oriented Learning](image)

**Figure 1. Data of Teacher's Skills in Designing Problem-Oriented Learning**

Based on Figure 1 above, it can be seen that it can be seen that the percentage of participants' skills in drawing up a learning problem-solving scenarios and assessments has not appeared at all compared to the indicator selection model and problem-solving learning media but it is still lower than the total percentage of participants' skills in establishing core competency, basic competencies, and indicators, the formulation of objectives and scope of the material that has been very good. This indicates that teachers still need information about knowledge of problem-solving learning in elementary school, this has an impact on the skills of teachers in designing learning-oriented problems. Or in other words, the facts show that teacher's knowledge related to the problem-oriented learning problem needs to be improved and given skills in designing problem-oriented learning.

Weak teacher skills in designing learning can be seen based on the results of interviews with participants related to the skills of participants in designing problem-oriented learning in class. The results can be seen in the results of the following interview.

"It was quite difficult to teach the problem-solving in my class, it was difficult to choose a suitable learning model, the existing learning model was helpful but not effective ... because the steps at each stage of learning were difficult to memorize and remember, besides that I needed quite a lot of time to implement it and adjust it in class, and finally I use lectures and discussions to make it more effective and faster to deliver the material ... "(Interview of Teacher B, May 24, 2019).
Similar to teacher B, teacher A also thinks almost the same as expressed by teacher B, following a fragment of the results of the interview.

"... my existing learning models are difficult to apply, plus the material that must be delivered to many students ... well, I go back to lectures, demonstrations, and deliver more material with the help of the media ..." (Interview of Teacher A, May 26, 2019).

Departing from problems, teachers need training or workshop related to how to teach problem-solving to students through innovative learning models, and teachers need knowledge and skills related to what problem-solving is, what indicator is, and how to design problem-oriented learning is.

4. Conclusion
Learning the concept of the environment is done in different activities between both these teachers, but both of them, there is no visible learning that helps stimulate the problem-solving ability of the students. Activities are more centered on the teacher (teacher-centered) whereas learners only act as the recipient of the knowledge (transfer of knowledge). Learning takes place with lectures related to that environment, what kind of impact the environment if the environment is damaged, how to care for the environment and others. Based on the opinion of the teacher learning problem solving is difficult to teach, requires a considerable amount of time, and should think of making types of questions that stimulate students' problem-solving skills that are difficult to make. The most important for teachers is the material delivered everything. Teachers also argue developing problem-solving skills in junior high school basic learning, whereas that in developing problem-solving capability must be in a habit and were taught early on i.e. Since learners sit in bench elementary school. Based on this the teacher needs a variety of information and training related to the importance of teaching problem-solving skills in primary schools, any innovative learning model that can help them teach problem-solving to students.

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