

Research Article

Analysis of Problem-solving Ability of SDN Dinoyo 3 Malang Students in Inquiry Learning

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Abstract.

This study aims to find out about the role of the scientific inquiry learning model in students' problem-solving ability in science material for elementary school students. The method used in this research is descriptive qualitative research method. The place for this research is SDN Dinoyo 3, Malang. The study was carried out on a total of 27 fourth grade students. Data were collected through observation, interviews, and documentation. The data analysis were done using data reduction, data presentation, and data verification. The results of this study indicated that the learning process that applies the scientific inquiry learning model is more efficient for problem-solving ability. Students in the scientific inquiry learning model will play an active role in the process of learning activities, where they are required to be able to solve the given problems. Based on the results of student tests and discussions, it can be concluded that the level of problem-solving ability of students of SDN Dinoyo 3 Malang needs to be improved. Factors that affect students' problem-solving ability are, students' lack of accuracy in doing questions, students rarely do questions that are oriented toward problem-solving ability, and lack of mastery of the concept of the topic of hydrology cycle from students. The implications of this study can provide information about the level of students' problem-solving ability on the indicators displayed. This research is only limited to analysis to determine students' problem-solving ability, so it is hoped that further research can be carried out which includes the development of learning instruments that can support students' problem-solving ability.

Keywords: problem solving, inquiry, learning, hydrology cycle

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1. INTRODUCTION

Basic education is a place or a place to develop the potential of human resources to educate the nation's children. As social beings or individuals, education is a necessity for humans. Education is carried out in order to gain knowledge and skills to improve and develop the quality of students. This is in accordance with the purpose of education, namely Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character, and the skills

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they need. community, nation and state ('Undang-Undang Republik Indonesia Nomor 20 Tahun 2003 Tentang Sistem Pendidikan Nasional' 2003) .

Learning is a process of interaction between educators and students and its implementation is in the educational process to achieve learning objectives in accordance with the curriculum used. Learning objectives will be carried out well if there are supports in learning such as learning models and learning resources. Educators can use various learning resources to improve students' abilities, for example problem solving ability.

Every human being in his daily life will always face problems, therefore every human being, especially students, must learn to solve problems. (Fazrin, Widyatiningtyas, and Sukmana 2019) states that problem solving ability are meaningful learning, because meaningful learning can start from a problem. In learning requires teachers to provide opportunities for students to practice their metacognitive skills by providing questions in the form of problem solving (Suryaningtyas and Setyaningrum 2020). So that students must be reliable in problem solving ability.

The inquiry learning model is a learning model that has a problem-based nature. An inquiry-based learning experience through observation and experimentation (Lombardi 2007). Inquiry learning model is a series of learning activities that emphasize the process of thinking critically and analytically to seek and find the answer to a problem in question (Daryanto and Karim 2017). The Inquiry learning model has a syntagmatic learning which includes: (1) formulating problems; (2) create a hypothesis; (3) designing the experiment; (4) carry out experiments to obtain information; (5) collect and analyze data; (6) draw conclusions (Trianto 2009). The inquiry learning model is one of the effective learning models.

The scientific inquiry learning model is one of the learning models that can improve students' ability to solve problems. One of the inquiry learning models is scientific inquiry. In this study, it is intended that student learning activities can be developed, namely scientific knowledge and knowledge about scientists or researchers who learn about nature.

Schwab was the first researcher to conduct research on the biological study of scientific inquiry (Joyce, Weil, and Calhoun 2009) They stated that the scientific inquiry learning method aims to be a disciplined research and have a good effect. In addition, social methods can be used to solve social problems and increase knowledge about social understanding.. Students will gain knowledge about how to make questions and answer with existing evidence (Kusnadi et al. 2017). The learning process in scientific inquiry, students learn to conduct investigations and collect evidence from various sources, develop explanations from data, communicate and defend conclusions.

The development of Science and Technology (IPTEK) is a phenomenon that cannot be avoided in the 21st century. On the one hand, the activities of daily human life will be lightened by the development of science and technology (Hidayat et al., 2017), but on the other hand, the development of science and technology can be a disaster, when a person cannot adapt to these developments. Thus, to be able to adapt to the rapid development of science and technology, adequate skills that can compete globally need to be possessed (Siahaan et al., 2017; Nur'asiah et al., 2015), where one of these ability is problem-solving ability. Problem-solving ability are one of the important competencies that students must have (Greiff et al., 2013). This is because students can develop adequate skills. The solution and problem-solving process can be found by students (Lismayani & Mahanal, 2017). In addition, To improve students' ability to solve problems, it will be useful or have a positive impact on students' skills, one of which is science skills (Yulianti & Khanafiyah, 2012); critical thinking skills (Zunanda & Sinulingga, 2015); communication skills (Yavuz & Guzel, 2020); science literacy (Thummathong & Thathong, 2016); and entrepreneurship skills (Kim et al., 2018), so that teachers can develop students' problem-solving ability, especially in the learning process.

According to Mukhopadhyay (2013) in his research, learning process activities that integrate problem solving can help students in building new knowledge, so teachers need to pay attention to and develop problem-solving ability, especially in natural sciences. Science is a branch of science whose focus of study is nature and the processes in it. Science learning is the study of humans or the study of the problems of how humans develop a better life. The learning objectives of science are as follows. (1) understand the surrounding nature; (2) have the ability to gain knowledge in the form of process ability / scientific methods; (3) have a scientific attitude in knowing the surrounding nature and solving the problems it faces.

In other words, students who can study natural science well, including in this topic of the hydrology cycle, will be able to be a good problem solving in society (SCE, 2012). Problem solving ability are a series of thinking processes to find the right way to get a solution to a problem (Widiasih et al., 2018). Problem-solving ability can also be defined as the ability of identifying problems using non-automatic strategies so thatt students will be ablee to solve problems on their own and work more effectively (Nugroho, 2018).

In the implementation of problem solving, experts have diverse opinions regarding components which are then used as a reference as indicators of problem-solving ability. Indicators of problem solving according to experts. So, the indicatorr for problem solving skills is in the developed Goldilock Help concept by (Yuriev et al., 2017), and the five indicators are understanding the problem (understanding), analysis (students are able to

analyze problems), planning (students are able to carry out other plans related to solving problems), implementation (applying plans to solve problems), evaluation (evaluating solving problems).

The importance of aspects of problem-solving ability is also because through these ability, students can be helped to make the right, systematic, logical decisions, and consider various points of view (Paidri, 2011). In addition, in 2018, based on the results of the survey data by PISA contains the problem-solving component for students, namely showing the figure of 70% that Indonesian students cannot achieve level 2 in the PISA framework, even though the average that must be achieved is only about 23%, in 79 countries of PISA participants they do not. can achieve or master reading skills at level 2 (OECD, 2019). This shows tthat the literacy of Indonesian students, which also includes problem-solving ability, is still very low.

Departing from the results of PISA and some of the research above, it is necessary to conduct further research on the problem solving ability possessed by students, so that in the future appropriate learning can be formulated in supporting students' problem-solving ability.

Based on the results of observations and interviews at SDN Dinoyo 3 Malang in class IV. In the learning carried out by the teacher, students only get material with the lecture method and reading textbooks. By using this method, students are less motivated in problem solving ability activities. A monotonous learning situation will make students passive, so they only listen to the information conveyed by the teacher. So that when students are required to solve a problem, they will find it difficult. Students' ability in problem solving are still lacking. To improve problem solving ability, learning must be done by applying the right learning model. The Scientific Inquiry learning model is one of the suitable learning models to improve problem solving ability.

Based on the explanation above, the purpose of this study is to describe the role of Scientific Inquiry to Improve Student ability in Problem Solving in Science Materials in Elementary Schools.

2. METHOD

The type of research used is a qualitative descriptive approach. Qualitative research is a problem formulation that guides research to explore social situations. This is in line with the opinion (Sidiq and Choiri 2019) that qualitative research is an inquiry strategy that emphasizes the search for meaning, understanding, concepts, characteristics, symptoms and descriptions of a natural and holistic phenomenon.. In addition, qualitative

research according to (Lexy J. Meleong 2007) is a research procedure that produces descriptive data in the form of written or spoken words from people and observed behavior. This study intends to describe qualitatively the role of scientific inquiry in problem solving for fourth grade students at SDN Dinoyo 3 Malang.

This research was conducted at SDN Dinoyo 3 which is located at Jalan MT. Haryono Gg. 13 No.139A, Dinoyo, Lowokwaru District, Malang City, East Java Province 65144. The choice of this place is because researchers know enough about the development of education in the area that will be the goal of the research. The time used in this research is the date 06 October 2022 – 20 October 2022.

The subjects in this study were fourth grade students, totaling 27 students. The researcher chose class IV as the research subject because the learning process carried out by the class teacher was still using the lecture method and reading textbooks so that the problem solving ability of students were less than optimal. The sampling technique in this study is purposive sampling. According to (Sugiono 2019) purposive sampling is a sampling technique with a certain consideration. So in this research sample there are criteria set by the researchers, namely class IV teachers and class IV students totaling 27 students at SDN Dinoyo 3.

The research procedure used in this study uses three stages according to opinion (Lexy J. Meleong 2007) namely the pre-field stage, the field work stage, and the data analysis stage. Here is the explanation:

1. Pre-Field Stage

At this pre-field stage, six steps will be carried out, namely: preparing a research design, choosing a location, managing a research permit, observing the research site, selecting sources, and preparing research equipment..

2. Field Work Stages

At this stage, the researcher collects the data needed for the implementation of the research. At this stage the researcher carries out activities in the form of limiting the background and researchers, introducing the research at the researcher's place and the amount of time in the study.

3. Data Analysis Stagesa

At this stage, researchers carry out analytical activities from various data that have been obtained, both from informants and documents at other stages.

Data collection techniques in this study were observation, interviews and documentation. The observations made were participant observation, where the researcher

participated in activities as a source of research data. Interview activities carried out in this study were semi-structured interviews. Researchers use this type of interview because it is to find out what are the ways in which teachers carry out learning activities in the classroom, as well as to obtain information from students about how the responses of the learning methods provided by the teacher are. In conducting interviews, the researcher listened carefully and wrote down what the respondents had to say. As evidence of having conducted research, data collection techniques are needed in the form of documentation. This technique is used to take photos during the activity

3. RESULTS AND DISCUSSION

The following are the results of research and discussion on the analysis of students' problem-solving ability in inquiry learning. After the researchers conducted research, the results obtained that students' low problem solving abilities were influenced by various factors. One of them is that students lack training in working on questions that have an ability orientation to solve problems and students are less careful when working on questions.

3.1. Indicator 1: Understanding the Problem

On the indicator of understanding the problem includes ability in forming a proper understanding of the problem, as well as recognizing the relevant information available. The results of this study are in accordance with the results of interviews that have been conducted with students, namely when working on multiple choice questions students have no difficulty even though in reality not all students get good grades or maximum grades.

3.2. Indicator 2: Analyzing the Problem

On the indicators of analyzing this problem intended is the skill in reciprocally linking (causation) of the existing problem. Indicators analyze the problem. The results show that students are already able to properly relate the reciprocity (causation) of the existing problem. Students who can understand the problem well, will also tend to be able to analyze the problem, as well as relate various information obtained well. The stages of problem analysis become stages that are also important in problem-solving ability. In

this second stage students must have assumptions and be able to interpret information correctly, when a problem is analyzed by the student wrong, then when solving the problem it will be wrong in interpreting it (Nyachwaya et al., 2014).

3.3. Indicator 3: Planning Alternative Problem Solving

In this indicator of planning alternative problem solving what is intended is the skill in making connections between the knowledge possessed and the alternative problem solving to be designed, as well as planning approaches and strategies to solve problems. Level of Achievement Indicators Planning Alternative Problem Solving This third indicator is the indicator that has the lowest level of achievement when compared to other indicators in problem-solving ability. This suggests that students' weak points in problem-solving ability are in the process of planning alternative problem solving, which also corresponds to the research carried out by (Yanti et al., 2016). Based on the results of the interview, students stated that in the learning process rarely trained problem-solving ability. This is in accordance with the research conducted by (Aydogdu, 2012), as well as (Ferreira & Trudel, 2012) suggests that in the learning process students experience difficulties, namely they are not accustomed to practicing in solving problems, while students who often carry out problem-solving or problem-based learning activities will have higher scores, there is a significant difference in grades. Students need to be accustomed to solving problems in the learning process, because the learning process based on problem solving has a positive influence on students' critical thinking and problem-solving perception (Temel, 2014). Students who always work with a process or with the right steps on a skill aim to make students feel easy when working on these skills so that they do not experience difficulties (McInerney & McInerney, 2010). In addition, some students who have low scores in this third indicator, if attributed to the results of the interview, claim to have not understood the material well. According to (Rasiman, 2013) in his research, the limitations of students in understanding the material, make it difficult for students to relate the existing information with the completion plan to be carried out. The problem solving plan will be well designed, if it is supported by good student knowledge (Hadi, 2019). Another factor that makes this third indicator fall into the category of lack of attention is the lack of accuracy of students in reading questions. Questions in the form of long texts make students less thorough, so that the problem planning made, also becomes less optimal and even illogical. In addition, the factor of students rushing to answer the problem solving planning questions also supports the lack of optimal implementation of problem solving, which will later be

further reviewed in the fourth indicator. This needs attention, because solving problems with the problem solving stage requires a long time in the process, and cannot be done in a hurry (Maemanah et al., 2019).

3.4. Indicator 4: Implementing Alternative Troubleshooting

In the indicators of implementing this alternative problem solving, what is intended is skill in carrying out the planned problem solving flow. The results show that students still have difficulty in implementing the plans that have already been made. Students who experience difficulties are caused by students' misunderstandings or misconceptions, so that when carrying out problem solving activities the student's answers are incorrect or inappropriate. This is in accordance with the results of tests that plan problem-solving activities, namely some students get less marks. The results of this study are in accordance with research conducted by (Yanti et al., 2016) who argues that students who carry out problem-solving activities but are not logical, will have an impact when implementing plans that are not in accordance with problem-solving activities that should be carried out.

3.5. Indicator 5: Evaluating Implemented Problem Solving

In the indicators, evaluating the problem solving implemented is intended to be a skill in checking the efficiency of the problem-solving approach, as well as responding to things that deviate from the role. This moderate category on the fifth indicator, indicates that students have not been able to master the ability in the fifth indicator well. From interviews conducted with several students, it was found that in working on problem-solving ability, students tended to rush, so that in answering the questions, students felt no need to check the answers again, because students believed that the plan designed was optimal and did not need to do another evaluation. This is supported by research conducted (Sanjaya et al., 2017) argues that students in general will be quickly satisfied and confident with one solution they have without thinking about alternatives or other solutions to solve the problem. Review of Interview Results In addition to deriving from student test results, to strengthen the analysis of students' problem-solving ability in the hydrology cycle material, an interview process is also carried out after students take the test.

The interviews conducted are about students' experience of all the questions they do, students' knowledge of what problem-solving ability are, and the general obstacles

students experience in the process of working on problem-solving ability tests. In general, the results of interviews with students give an idea that in working on multiple-choice questions, students do not experience significant difficulties. However, on the question of description, students stated that many have difficulties. The difficulties experienced by students also vary, including students' confusion in relating the material to the available problems due to the lack of understanding of students' concepts to the hydrology cycle material. In addition, students also stated that when they saw so many question readings, students became in a hurry in doing the questions, so that the students' thoroughness in working on the questions became disturbed. Furthermore, another difficulty found from the interview results is that students feel unfamiliar with problems that are oriented towards problem-solving ability.

4. CONCLUSION

Based on the results of student tests and discussions, it can be concluded that the level of problem-solving ability of students of SDN Dinoyo 3 Malang needs to be improved. Factors that affect students' problem-solving ability are: students' lack of accuracy in doing questions, students rarely do questions that are oriented towards problem solving ability and lack of mastery of the concept of the topic of hydrology cycle from students. The implications of this study can provide information about the level of students' problem-solving ability on the indicators displayed. This research is only limited to analysis to determine students' problem-solving ability, so it is hoped that further research can be carried out which includes the development of learning instruments that can support students' problem-solving ability.

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