Creative Thinking Skills in Science Lessons in Elementary Schools

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Abstract: This research aims to describe the creative thinking skills of students in science learning in elementary schools. This type of research is qualitative research with a case study approach. The technique of collecting data uses observation, interviews, and questionnaire. The research subjects in this study were fifth grade students of SD Negeri 1 Taruban, Nogosari, Boyolali which numbered 22 students and fifth grade teacher. Data analysis using descriptive analysis in the form of data reduction, data presentation, conclusion, and verification. Test validity data using source triangulation. The results showed that students' creative thinking skills were still low.

Keywords: *thinking skills, creative thinking, science learning*

INTRODUCTION

Creative thinking skills are one of the skills emphasized in learning 21st Century. Trilling (2009) has the ability that 21st Century focuses on innovation learning skills, namely (1) critical thinking and problem solving as expert thinking; (2) communication and collaboration as complex forms of communication; and (3) creativity and discovery to apply imaginary power and imaginary results or inventions. These three skills are key to learning and become a demand in the 21st Century workforce.

Based on the competence of the 21st century, the quality of education must be able to produce graduates who can compete globally. To answer the challenges of this era education must be able to produce graduates who are competitive, innovative, creative, collaborative and characterized. In addition, creative thinking skills are very important in today's modern society, especially in facing the 4.0 industrial revolution because it can make people become more flexible, open, and adaptable to various situations and problems in life.

In addition, the importance of developing creative thinking skills in the world of education was also expressed by Munandar (2009) that education should be directed at developing the creativity of students so that they can meet the needs and needs of the people of the country. Therefore, handling creative thinking skills in the world of education needs to be integrated into subjects.

Science is one of the subjects that can be integrated with creative thinking skills. Science is a systematic collection of theories, its application in general is limited to natural phenomena, born and developed through scientific methods such as observation and experimentation and demands scientific attitudes such as curiosity, openness, honesty, etc. (Trianto, 2014). In science learning students can explore extensively about concepts that can be learned directly from nature. In the context of science learning in elementary schools, each student has a certain idea/conception of a natural phenomenon. These various conceptions show variations in students' thinking in terms of recognizing and solving problems contained in a natural phenomenon. This fact indicates a link between creative thinking skills in science learning.

Creative thinking is done bybreaking the patterns that have been formed with the aim of looking at things in different ways (Yunus, 2014). Creative thinking is very important for

students to face problems or problems both in learning and in everyday life. When the ability to think creatively develops it will give birth to ideas (ideas), find relationships that are interrelated, create and do imagination, and have many perspectives on things. Students who have high creative thinking skills tend to feel challenged and interested in solving various problems in learning. Interest in solving this problem also causes curiosity. In learning, curiosity is very necessary to obtain the relationship of concepts that have been learned and that are being studied, so as to solve the problems faced.

Indonesian students are classified as having low PISA (*Program for International Student Assessment*) results during their participation in 2000 . The results of the PISA study in 2015 science lessons showed an average score of 403. Based on the PISA results from 2009-2015, Indonesia experienced a significant increase. In 2009 Indonesia achieved a score of 383 points in science, then experienced a decrease of 1 point in 2012 to 382 points. In 2015 the score increased to 403 points. This increase shows the progress of learning in the field of science. Even though Indonesia's achievements have increased, Indonesia is still behind other countries. This is evidenced by Indonesia's ranking which is ranked eighth lowest among PISA participating countries (OECD, 2016).

The results of the PISA study are in harmony with the results obtained by the TIMSS (*Trends in the International Mathematics and Science Study*). The results of the TIMSS 2007 and TIMSS 2011 study show students' low SAINS abilities in Indonesia. For TIMSS 2015, SAINS student achievement score only 397 points puts Indonesia is on rank 45 of the 48 participating countries (IEA, 2016). The problems found in PISA and TIMSS are mostly not routine questions that can be solved by memorizing them. The problem solving requiresstudents to think creativity. Therefore, creative thinking skills need to be improved in science learning in Indonesia.

Creativity is very contextual and environmental factors need to be taken into account in explaining the gap in creativity (Runco et al, 2017). Environmental factors that can be influential in learning creative thinking skills one of which is the use of learning models by teachers. Learning models that fit the characteristics of students and creative learning can develop students' creative thinking skills.

Aspects of creative thinking to assess the creative product and creative thinking skills a person needs a product creativity for help judgment in a manner scientific. Product creativity consists on four category namely: (1) fluency, that is ability for many produce idea and the answer settlement that is relevan and current thought smoothly; (2) flexibility, that is ability for produce idea or uniform answer but direction thinking different and able to change way or approach; (3) authenticity (originality), that is ability for give away answers that are not prevalent, different from others and rarely given most people on generally; (4) details (elaboration), that is ability for develop, add, enrich something idea or answers, detailing details and expand something idea or answer (Munandar, 2012).

METHOD

This type of research is qualitative research with a case study approach. The purpose of this study is to find out creative thinking skills in science subjects of students at the elementary school level. This research was conducted in SDN 1 Taruban, Nogosari, Boyolali. The time of the study is carried out in the even semester of the 2018/2019 academic year. The research subjects were fifth grade teacher and fifth grade students, amounting to 22 students. The reason the researchers chose the school was because the school had an achievement as the number 1

result of the national exam at the sub-district level for 9 consecutive years, and in such schools there had never been a similar study.

Sources of data in this study come from the results of observations, interviews, and questionnaire. Data collection can be done in various *settings,* various sources, and various ways. Data collection techniques in this study used the method of observation and interviews. The observation method in this study aims to obtain a clear picture by direct observation of the object of research. Interviews are conversations with specific intentions. In this case the researcher asks questions related to creative thinking skills.

The data validity test technique in this study uses triangulation. Triangulation in this study uses source triangulation. The data analysis technique used in this study is that the data used in this study is an interactive data analysis model by Miles and Huberman. The interactive data analysis activities include data reduction, data presentation, conclusion drawing, and verification.

RESULTS AND DISCUSSION

The creative thinking approach carries a great importance for the individuals in pre-school, primary school, secondary school or for the individuals studying in higher education (Hursen et al, 2014). To find out firsthand how the conditions of learning creative thinking skills in the field of science, the researchers observed the science learning activities that were taking place at that time. From the results of these observations the following results are obtained: (1) Students who ask questions are still few and the activity in the class is still lacking; (2) When given a question by the teacher, not all students immediately do it, there are even students who do not do it and wait for the results of their friend's work to be cheated.; (3) Students have not been able to express new ideas that they have gained during the learning process. Chan (2012) and Eyadat & Eyadat (2010) have indicated that creativity is important in connection to problem solving and creating new ideas; (4) When the discussion activities take place, not all group members participate in the discussion, only active students discuss.

Asking a question is one indicator or criterion that can be used to assess students' thinking skills. The criteria for assessing student creativity have been extended in the five-sided creativity model Lucas, Claxton and Spencer (2013): *Inquisitive*, Imaginative, Discipline, *Cooperative, Persistent*. *Inquisitive* refers to (a) wondering and questioning, (b) exploring and investigating, (c) challenging assumptions. Imajinative measured by (a) solution and imaginative possibilities, (b) making a connection, (c) use intuition.

Rahimi (2013) has expressed that besides descriptions of imagination and foresight, creativity can be described as the ability to innovate a fact and being able to create a difference at a continuing process. If students have not been able to express the new ideas that they have gained during the learning process, it will affect their creative thinking skills because creating new ideas is part of creativity. As stated by Saliceti (2015) that creativity is the quality or ability to create. The ability to create new and original ideas. This is the ability to create creative thinking, such as the ability to communicate or study.

Creativity often describe as "seeing the same and thinking different", "the ability to solve aesthetic problems", "gathering the problems not former put together", "to be sensitive to problems, troubles, lack of information, items of the missing, non-compliance and identify difficulties, seek solutions and to make estimations" and "bringing unusual solutions to the daily problems". One of the most important and accepted skills of our day are originality and usefulness (Bacanli et al, 2011). For this meaning, to be creative, we need to create new and

useful things. Producing only new things is not a sufficient criterion for creativity. Useful products made should be solving a problem. Or even, they gain or lose creativity based on the problem they solve. The creativity shows itself in two dimensions: context and content. However it is hard to have a systematic creative thought and this is related to it being divergent.

The results of the observation were also supported by the results of interviews with the fifth grade teacher at SD Negeri 1 Taruban. Interview result shows that creative thinking is very important indeed taught, but in practice is still not able to run with the maximum. This is because in the learning process the teacher ocuses more on cognitive assessment and less attention to the learning activities of students which leads to the process of creative thinking. Tran et al. (2016) found that lack guidance for teachers in how to prepare, implement, and assess lessons aimed at developing students' creativity and ways to assess student creativity is the main challenge that limits teacher success in teaching for creativity.

One of the most important tasks of education is to teach the students the ways of right thinking. With the beginning of the twentieth century, the education has taken over this task and aims to give accurate information and bring correct thinking skills to students and aims to bring the thinking skills (Bacanli et al, 2011). The learning activities carried out by the teacher have tried to encourage students to be motivated in participating in learning, but still not able to develop creative thinking skills of students.

To overcome this, the teacher can use alternatives to improve creative thinking skills by using collaborative learning. Collaborative learning and teaching approach delivered using a ubiquitous learning environment could provide strong support for developing undergraduate students' creative thinking skills because students can share knowledge and interact with their friends (Laisema, 2014).

According to Baker et al. (2001), educators are only able to enhance their students' ability to solve problems in different contexts if they understand the relationship between types of thinking: critical thinking and creative thinking. Classroom environments that encourage students to present creative ideas should also help them be critical and evaluate their solutions, as proposed by Fairweather & Cramond (2010).

Fifth grade teacher also revealed that

"Students' daily test results in the form of description questions or essays are mostly of poor value and many of the answers are almost the same"

Creativity was examined by four divergent thinking measures: fluency, flexibility, originality, and elaboration (Wechsler et al, 2018). However, many students cannot yet create an original idea. There are still many students who copy the work of their friends. This shows that the way of thinking of students in solving problems is far from being creative.

The results of observations and interviews were also supported by the results of the questionnaire. Students are given a questionnaire about creative thinking skills in science learning. The results of the questionnaire obtained by students were grouped into four categories, namely very good, good, sufficient, and lacking. More can be seen in Table 1 below:

Table 1. Recapitulation of the results of the questionnaire creative thinking skills

No.	Score Range	Category	Total Students	Percentage
1	3,00 – 4,00	Very Good	3	14%
2	2,00 – 2,99	Good	4	18%
3	1,00 – 1,99	Sufficient	10	45%
4	0,00 – 0,99	Lacking	5	23%

Based on Table 1, it can be seen that students who have very good creative thinking skills only have 3 students with a percentage of 14%. Students included in the good category amount to 4 students with a percentage of 18%. While the other students are in the sufficient and less category. Sufficient categories as many as 10 students and lacking categories as many as 5 students with a percentage of 45% and 23% respectively. Of the 22 students who worked on the questionnaire, the highest score was 3,75 and the lowest score was 0,95. Students who are in the good and very good category are still less than 50%. This shows that the creative thinking skills of fifth grade students are still under the good category.

In Thailand, creative thinking skills are very important. As expressed by Miller & Dumford (2015) that creative thinking is an essential soft skill for future Thai citizens and impacts on the development of innovation. Not only in Thailand, in Indonesia it should be equally important. It's just that the level of creative thinking skills in Indonesia is still not well developed.

CONCLUSIONS

Based on the results of research and discussion can be concluded that creative thinking skills in science subjects learners fifth grade students in SDN 1 Taruban can be said is still low. In this case there needs to be guidance on creative thinking skills in order to develop properly.

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