



## Analysis of Students' Creative Thinking in Science Learning

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### Abstract

In the current era, students face very complex problems in life. They can solve these problems depending on the ability to think creatively. The purpose of the research carried out was to determine the creative thinking skills of elementary school students in science learning on the water cycle material. The subjects of this study were 32 students in class V at an elementary school, in Kramatmulya District, Kuningan Regency, West Java Province. Data collection techniques carried out by using interviews and tests. The data analysis technique used is a qualitative descriptive analysis. The results of the study show that the average score associated with students' creative thinking is only about 34%. In addition, based on the results of interviews and tests, it shows that students' creative thinking is still low. The conclusion in this study is that students still have low creative thinking skills because scores on each indicator of creative thinking skills are still low.

**Keywords:** Creative thinking, Science, Elementary School

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## INTRODUCTION

Rapid technological developments are being felt in today's digital era. The influence of technology that is felt cannot be separated from the field of education. Various quality improvements and existing changes can be linked to technology that can be implemented starting from a small scope in learning activities to a wider scope, where this needs to be a concern by preparing as best as possible. In entering the digital era, it requires adjustments to current technological developments and advances, where this can facilitate the implementation of education. This education requires us to have a number of skills known as 4C, namely communication, creativity, critical thinking and collaboration (Erdogan, 2019; Kisno et al., 2022). In addition, creative thinking skills can be considered as one of the key competencies in implementing education in the twenty-first century today (Biazus & Mahtari, 2022; Ritter & Mostert, 2017).

In education, the ability to think creatively (creative thinking) is important to develop, so that it can assist students in implementing learning activities to achieve the expected learning objectives. Creative thinking is one of the thinking skills needed by students, which is inseparable from activities related to observing and analyzing a number of existing problems in the form of planning and ideas so that solutions can then be determined in the learning process (Dong et al., 2017; Ritter & Mostert, 2017; Segundo Marcos et al., 2020; Ward et al., 1997). In addition, according to Torrance in (Munandar, 2016)) explains that creative thinking is a scientific process that consists of formulating problems, making hypotheses, conducting experiments, as well as analyzing and making conclusions.

The ability to think creatively can be developed, one of which is through learning science by actively involving students with guidance and directions so they can develop their creative

thinking (Kumdang et al., 2018). In essence, science can be related to the environment around students (Sahronih et al., 2019). Science is a subject that can be related to natural phenomena which are arranged systematically from the results of experiments and observations that have been carried out by humans (Amini, 2017; Astutik et al., 2018; Jannah & Atmojo, 2022; Sujana, 2016). Thus, science can be implemented early on at the elementary school level. The goal of learning science in elementary schools is that students are expected to have knowledge, scientific attitudes, and process skills that are useful in implementing learning (Sujana, 2016).

However, in reality the ability to think creatively has not been optimally developed to be developed (Leasa et al., 2021; Wulandari et al., 2019). The low creative thinking of students, especially at the elementary school level in science learning, is due to the lack of direct student involvement during learning which can affect understanding of the material (Puspita et al., 2022; Sofiatun Nisa & Suryanti, 2013). The reality on the ground shows that implementing science learning makes students more accustomed to memorizing material or concepts in science learning, and students are still fixated on textbooks or summaries of the material provided by the teacher (Puspita et al., 2022). Based on the results of this study, researchers seek to identify students' creative thinking skills and try to improve them.

## METHOD

### Research design

The research design used in this research is to use a descriptive qualitative method using a qualitative approach. The data collection technique used is by merging and analyzing inductive data (Sugiyono, 2017). This qualitative research can produce data and process the data which is descriptive in nature. In connection with the flexible and open nature of qualitative research, the types and methods of data collection in qualitative research can be said to be very diverse which can be adapted to the problems, research objectives, as well as the nature of the object being studied.

### Research subject

The research subject is one of the important components used in research activities. The research subject is the place where the data is obtained for further use as a variable in research (Arikunto, 2021). This research was conducted on fifth grade students at an elementary school, in Kramatmulya District, Kuningan Regency, West Java Province. The selection of subjects in the study was carried out by analysis according to predetermined criteria, namely students with low, medium, and high middle of semester mathematics scores totaling 16 male students and 16 female students. Data collection techniques used were interviews and validated creative thinking tests.

### Research Instruments

The instrument used in this study was in the form of students' creative thinking questions based on indicators of students' creative thinking used and adapted from (Munandar, 2016). The questions and indicators used are shown in Table 1, which are as follows.

**Table 1.** Questions and Indicators Used

No	Questions	Creative Thinking Indicator			
		Think Smoothly	Think Flexible	Original Thinking	Elaborative Thinking
1	Relates to identifying the water cycle that occurs.	Answer with a number of answers, and have many ideas about a problem.			

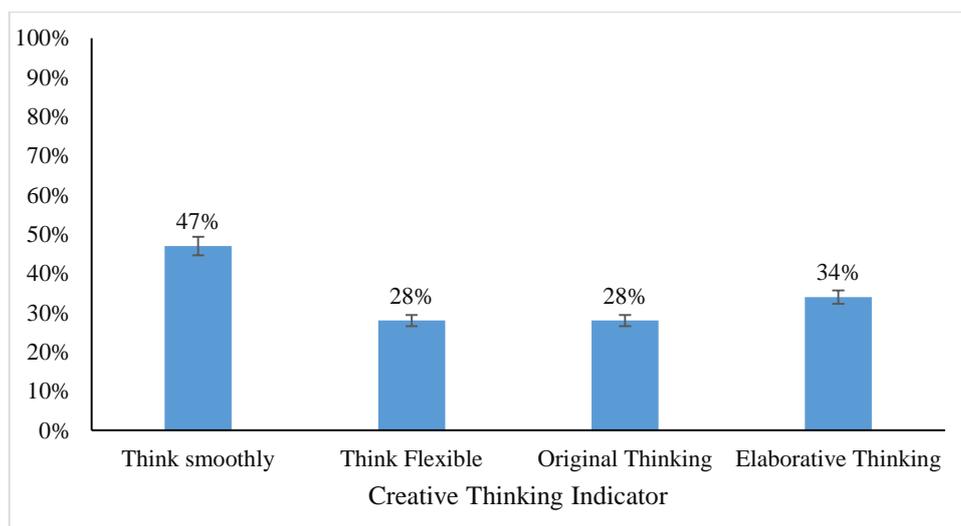
No	Questions	Creative Thinking Indicator			
		Think Smoothly	Think Flexible	Original Thinking	Elaborative Thinking
2	Related to explaining the causes of disasters that are influenced by the water cycle, as well as explaining the impact of disasters that are affected by the water cycle.				Develop or enrich an idea
3	Relates to explaining how to prevent disasters affected by the water cycle.			Have a different way of thinking than other people	
4	Relating to explaining how to maintain the sustainability of the water cycle.		Give consideration to situations that are different from those given by others		

### Data Analysis

Data analysis in the form of quantitative data on the acquisition of students for each indicator of creative thinking which is represented and described qualitatively according to the percentage of acquisition.

### RESULTS AND DISCUSSION

The results of tests that have been done before, in the form of giving a description test questions totaling four questions in science learning with water cycle material show that students' creative thinking is still relatively low. A number of students did not reach the indicators of creative thinking. In the implementation of learning it has not been carried out properly, planned and integrated to empower students' thinking abilities (Leal Filho et al., 2018) which in this case relates to creative thinking abilities. The test results can be seen in Figure 1.



**Figure 1.** Students' Creative Thinking Ability

Figure 1 shows that students who can think fluently get pretty good results, namely 47%. Indicators of fluent thinking are found in questions related to students who are asked to identify the water cycle that occurs. As many as 15 students out of 32 students could answer the questions correctly. Students can write about the process of the water cycle and have many ideas about a problem related to the water cycle (Assaraf & Orion, 2005).

In the elaborative thinking indicator contained in questions related to students who were asked to write down and explain the causes of a number of disasters and explain the impact of disasters related to the water cycle (Irsadiah, 2022), where as many as 11 students out of 32 students could answer the questions correctly. This shows that as many as 34% of students can fulfill these indicators, which in this case is related to the lack of students' ability to develop an existing idea.

In the original thinking indicator there are questions related to students who are asked to write down ways to prevent disasters that are influenced by the water cycle, it is known that as many as 9 students out of 32 students can answer the questions correctly. This shows that as many as 28% of students can fulfill these indicators which shows that there is still a lack of students' ability to have a different way of thinking than other people.

The flexible thinking indicator is found in questions related to students who are asked to write down ways to preserve the water cycle (Indrawati et al., 2020), where as many as 9 students out of 32 students can answer the questions correctly. This shows that as many as 28% of students can fulfill these indicators, which in this case relates to the lack of students' ability to give consideration to situations that are different from those given by other people.

Based on these results, it is known that the average score associated with students' creative thinking is only around 34% which indicates that students have not mastered the indicators of creative thinking in science learning (Maharani et al., 2020). So, it can be said that students' creative thinking in science learning in class V of Elementary School, in Kramatmulya District, Kuningan Regency, West Java Province is still lacking, especially in the water cycle material.

In addition, based on the results of interviews with students, a number of problems were also found related to students' creative thinking. Most students can only master at least two indicators of creative thinking in science learning, namely fluent thinking skills and elaborative thinking skills, while students cannot master other indicators of creative thinking properly. From this it shows that it is important to train elementary school students' mastery of creative thinking skills, as stated by (Ritter & Mostert, 2017) that creative thinking is currently considered one of the key competencies. So it is very important to be able to foster creative thinking, and students can develop themselves more through various activities carried out as well as in solving problems that exist in the implementation of learning activities by expressing

new things other than usual creatively. In line with this, (Hidayat et al., 2018) suggested that creative thinking can be said to be a mental activity that is used to be able to build and create new ideas broadly and diversely. In addition, creative thinking has a very important role that can affect student learning achievement (Sari & Montessori, 2021), if the thinking process is low, it will have an impact on the student's learning achievement. One of the things that is needed in developing students' creative thinking, one of which is through learning that can develop students' creative thinking skills, especially in science learning in elementary schools

## CONCLUSION

Based on the results of the research that has been carried out, it is concluded that students' creative thinking has not been fully developed by students, especially in science learning. In addition, most students can only master at least two indicators of creative thinking in science learning, namely fluent thinking skills and elaborative thinking skills, while students cannot master other indicators of creative thinking properly. So, it can be said that students from these elementary schools have low creative thinking skills, especially in science lessons with water cycle materials that need further development and learning to be able to develop creative thinking skills in elementary school students.

## RECOMMENDATION

Teachers can develop more interesting learning by involving students actively in the implementation of learning activities, such as by integrating learning using interesting media as a result of technological advances to be able to develop students' creative thinking abilities. In addition, it is necessary to carry out further research that is broader so that the implementation of education is more advanced and better in an effort to develop students' creative thinking abilities, especially at the elementary school level.

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