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How is Creative Thinking Related to Science Process Skills in Science Subjects at Elementary Schools?

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Abstract: Science is one of the subjects in the Indonesian Elementary School curriculum structure that have a strategic role in achieving the SDGs goals which are designed to encourage global efforts to achieve sustainable development. Science subjects contain a lot of knowledge that obtained from the scientific method. In carrying out the scientific method, a scientist must have scientific process skills and the creative thinking ability. So, this research aims to analyze the correlation between science process skills and creative thinking of Madrasah Ibtidaiyah Negeri 6 Cilacap students. This research is a quantitative method using non-parametric statistics (Spearman correlation test). The sample of this study was all class V students at Madrasah Ibtidaiyah Negeri 6 Cilacap. Data collection for this research was carried out using written tests and questionnaires. The Spearman correlation test results show that there is a significant relationship between science process skills and creative thinking with a P-Value of $0.008 < 0.05$. The correlation coefficient between science process skills and students' creative thinking was obtained at 0.402. This value can be interpreted that the correlation between science process skills and creative thinking in science subject is quite strong..

Keywords: *science process skills; creative thinking; science*

A. INTRODUCTION

Education is an important element in building quality human resources. This is in line with the vision of national development in education, which aims to increase the level of quality and intelligence of Indonesian society in order to create a just and prosperous society, as well as providing

opportunities for every level of society to develop their potential.

Elementary School (SD/MI) is the main foundation of the formal education system which has an important role in forming students' character and basic abilities. At elementary school level, Science subjects are one of the important components that



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students must master. Science learning is an integral part of the education curriculum in Indonesia.

Science learning at the elementary school (SD/MI) has an important role in develop children's understanding and thinking of basic scientific concepts, encouraging science process skills, stimulating natural phenomena and social events around them. On the other hand, science learning is expected to be able to strengthen students' imagination and creativity abilities. So, the learning process has a goal that does not just emphasize students' cognitive abilities or mastery of the material. However, the learning objectives are more complex, namely emphasizing the mastery of attitudes and skills (Nugraha et al., 2017). Science learning must also equip students with the knowledge, skills, and attitudes so they can contribute to sustainable development.

The learning process will be more meaningful when the learning process is easy for students to understand. In this way, teachers are expected to be able to develop more creative and innovative learning, so that they can achieve the learning goals. The science learning process should be interactive, inspiring, fun, and able to motivate students to participate actively and creatively. The science learning process should be able to provide direct experience to students so that they are able to develop various potentials, so that they can discover for themselves the concepts of the knowledge being studied (Ni Wayan, 2022).

On the other hand, student creative thinking is an important aspect that is often

given little attention in the learning process. Creativity is not only related to the arts, but also to the ability to think critically and innovatively in solving problems. In education, creativity can increase learning motivation and help students find ways to understand and apply knowledge. Creative thinking is the ability to generate new ideas and find innovative solutions to various problems. Creative thinking also needed in science learning. Students with a high level of creativity tend to learn better because they will always have creative ideas that can help them learn and apply science.

According to Kamus Besar Bahasa Indonesia (KBBI), process skills are defined as a person's ability to complete a task. Skill is an activity that requires thought and energy obtained through training and direct experience to carry out a task or worker. Science process skills are a series of skills of a scientist in carrying out scientific activities with the aim of finding answers to natural events that occur in life (Ni Wayan, 2022). The presence of science process skills in the learning process is not just about searching for and getting information but also experiencing the process that must be gone through to obtain that information. Science process skills are cognitive and psychomotor-directed scientific skills to be able to discover, develop and refute a certain theoretical concept or discovery (Arikunto, 2017). Science process skills help students understand scientific concepts in depth and apply them in everyday life.

Septantiningtyas groups process skills into two groups, namely basic level science process skills and integrated process skills

(Septantiningtyas, 2020). Basic level science process skills, namely, observing, communicating, classifying, measuring, concluding and predicting. Meanwhile, integrated science process skills consist of formulating hypotheses, naming variables, creating operational definitions, conducting experiments, interpreting data, and conducting investigations. Basic level science process skills are the basics that must be mastered first before introducing integrated science process skills (Hisbullah, 2018).

According to Supriadi (2011), creative thinking is the ability to generate new ideas, find innovative solutions, and think outside the box which is considered relatively different from what has existed before. According to Torrance (1984), creative thinking as 'a process of becoming sensitive to problems' involves four main components, namely fluency, flexibility, originality and elaboration. Understanding of the definition of creative thinking itself is very diverse. No single definition can represent diverse understandings or be universally accepted. This is because creativity is a complex and multidimensional psychological domain.

The creative thinking is important for students in facing changing times, for example in carrying out sustainable development as in the SDGs road map (Kep. No. 118/M.PPN/HK/08/2023). Of the 17 development goals, most of them are related to climate change and environmental degradation which are closely related science concepts.

Many research shows that ttudents who have the ability to think creatively will be

able to adapt to various situations. Previous research also found that science process skills can be obtained if students use their thinking abilities (Wiratman et al., 2021). So, this study aimed to investigate the correlation between creative thinking and science process skills.

B. MATERIALS AND METHODS

This research uses quantitative correlational methods. Correlational quantitative methods are research methods using statistical methods that measure the influence between two or more variables. This method was chosen to describe students' science process skills and creativity and analyze the relationship between the two variables numerically and objectively. This method is used to determine whether there is a relationship between science process skills (X variable) and students' creative thinking abilities (Y variable) in MIN 6 Cilacap. The research subjects in this study were all students of class V MIN 6 Cilacap. This research was carried out from April 20th 2024 to May 27th 2024.

Data of this research was obtained through written tests and questionnaires. The research stage begins with designing a test instrument to measure the scale of science process skills which is structured based on several process skill indicators, namely, observing, classifying, concluding, predicting and communicating. And the questionnaire instrument used to measure the students' creative thinking abilities is based on several indicators, namely, creative and imaginative nature, ability to collaborate, curiosity, and courage to take

risks, which consists of 9 positive statement items. The score used in this scale consists of four alternative answers, namely (1) strongly agree, (2) agree, (3) disagree, and (4) strongly disagree.

The data obtained from the research results were then subjected to correlation analysis using descriptive statistics with the SPSS version 26.0 for Windows program. Before testing the hypothesis, the prerequisites are first tested by conducting a data normality test. The normality test is carried out to determine whether the data population is normally distributed or not. Then, a correlation test was carried out to measure the strength and direction of the relationship between science process skills and students' creative thinking.

C. RESULT AND DISCUSSION

This research aims to analyze whether there is a significant relationship between science process skills and creative thinking of class V MIN 6 Cilacap students in the science subject. The following are the hypotheses tested in this research.

Ho: There is no significant relationship between science process skills and students' creative thinking abilities in the science learning

Ha: There is a significant relationship between science process skills and students' creative thinking abilities in the science learning

Before conducting a correlation test between scientific process skills and students' creative thinking, the data must meet the normality test. The normality test is carried out to determine whether the data comes from a normally distributed population or not. This is a prerequisite for

using parametric statistical tests. The statistical test that will be used is the Kolmogrov-Smirnov test taking a significance level (α) of 0.05 with the following hypothesis:

Ho: The data comes from a normally distributed population.

Ha: The data comes from a population that is not normally distributed.

The test criteria are: Ha is accepted if the significant value is ≥ 0.05 and Ha is rejected if the significant value is < 0.05 . The analysis were carried out using the SPSS 26.0 for Windows program.

Table 1. Result of Normality Test

	Kolmogrov-Smirnov		
	Statistic	Df.	Sig.
Science Process Skills	.080	43	.200
Creative Thinking	.156	43	.010

Based on this Table 1, it can be seen that the sig value of science process skills is 0.200, while the sig value of creative thinking is 0.010. Because the sig value for creative thinking is < 0.05 , it can be concluded that the data comes from a population that is not normally distributed. So, a non-parametric data test (Spearman's correlation test) was carried out to test the correlation between these two variables.

Table 2. Result of Spearman Correlation Test

Correlations	Science Process Skills	Creative Thinking

Science Process Skills	Correlation Coefficient	1.000	.402**
	Sig (2-tailed)		
	N	43	43
Creative Thinking	Correlation Coefficient	.402**	1.000
	Sig (2-tailed)	.008	
	N	43	43

Based on the Spearman correlation test in the Table 2, the close relationship between science process skills and students' creative thinking shows a coefficient value of 0.402. This means that the strength of the relationship between the two variables is classified as moderate or quite strong. It can be concluded that there is a fairly strong correlation between science process skills and creative thinking in class V MIN 6 Cilacap students in science subjects. Then we get a positive correlation coefficient number. It can be concluded that science process skills and creative thinking have a unidirectional relationship. The Spearman correlation significance criterion is if the sig (2 tailed) value is less than 0.05, then the relationship between the two variables will be said to be significant. The significance level uses 0.05 if there is * in the correlation coefficient and 0.01 if there is ** in the correlation coefficient. From the table above, the P-Value value is 0.008 and the value is <0.05. This means that there is a significant relationship between science process skills and creative thinking of class V MIN 6 Cilacap students in the science subject in. So it can be concluded from the results of

this research that Ha is accepted and Ho is rejected.

In the current era of globalization, scientific process skills have become an important aspect of science learning. Science process skills are a basic skill in studying science. On the other hand, creative thinking in science learning will enable students to be able to produce new ideas that are relevant to the problems they face, explore new concepts, be able to collaborate, have high curiosity and dare to take risks. These two competencies have a important role in realizing sustainable development which is the goal of the SDGs. This is because most of the SDGs objectives are closely related to the concept of natural sciences.

From the research results, the correlation coefficient was obtained which was positive. This means that science process skills and creative thinking have a unidirectional relationship. If the value of one variable is increased, it increases the other variables. So, the better the students' science process skills, the better their creative thinking abilities will be. And the better the students' creative thinking skills, the better their science process skills will be. Of course, in an effort to improve students' science process skills and creative thinking, learning is needed that can pay attention to these two aspects. Therefore, educators are expected to be able to design appropriate learning activities to improve students' science process skills and creative thinking abilities.

D. CONCLUSION

Based on the results of this research, it was concluded that science process skills and creative thinking have a positive and significant relationship in class V science learning. This is indicated by the P-Value value of $0.008 < 0.05$. Thus, it can be said that the better the students' science process skills, the better the students' creative thinking abilities and vice versa. Meanwhile, after the calculated r value is consulted with Sugiyono's interpretation guidelines for the correlation coefficient, it can be seen that the closeness of the relationship between the two variables is moderate/quite strong.

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