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PROFILE OF CREATIVE THINKING SKILLS AND STUDENT LEARNING OUTCOMES IN PROJECT-BASED SCIENCE LEARNING

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Abstract

National education requires students to have the ability to think creatively, especially exact subjects such as physics. The purpose of this study is to determine the profile of creative thinking of grade VII students of SMPN 10 Teluk Keramat on material for changing the form of objects for the 2020/2021 school year. The subjects of this study were grade VII students of SMPN 10 Teluk Keramat consisting of two classes A and B totaling 56 students. The research method used is the descriptive method. The variable of this study is the ability to think, namely creative thinking which is measured using a written test in the form of essay questions. Data collection uses questions developed from four creative thinking indicators, each question is given a score of 1-4 with the criteria of each indicator. Based on the results of the study, the creative thinking ability of grade VII students of SMPN 11 Teluk Keramat is 8.69 (15.51%) from a maximum score of 14. It can be seen from the ability of students based on the indicators of fluency 2.25 (33.92%), Flexibility 02.64 (58.92%), Originality 1.87 (53.57%) and Elaboration 1.87 (64.24%). The results of students' creative thinking ability are still lacking. Therefore, students' creative thinking skills need to be improved in the learning process.

Keyword: *Creative Thinking Skill, Learning Outcomes, Science Learning.*

INTRODUCTION

The purpose of national education is directed to develop the skills of students in educating the nation's life and also to develop the potential of students to become human beings who believe and fear God Almighty, have noble character, healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens. Law No. 20 article 03 of 2003 explains that one of the objectives of National Education is the creation of creative students. Creative thinking skills are a provision in facing industry 4.0 revolution.

According to (Mursidik, Samsiyah, &; Rudyanto, 2015: 98) creative thinking competence for students is very important in the era of global competition because the level of complexity of problems in all aspects of modern life is getting higher. According

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to the *Career Center Maine Department of Labor* USA (Mahmudi, 2010: 22), the ability to think creatively is important because this ability is one of the abilities desired by the world of work.

Creative thinking in physics learning is the main goal in the educational process. Learning Physics is part of the study of natural sciences. Natural sciences are classically divided into two parts, namely (1) *physical sciences whose* objects are matter, energy, and transformation of matter and energy,

According to (Nur, 2016: 43), one of the goals of education is to be able to make children think creatively both in terms of solving or solving problems as well as the ability to communicate or convey their thoughts. According to Siswono (Prasetiyo, et. al, 2014: 52), creative thinking is a habit of sharp thinking with intuition, moving the imagination, revealing (to reveal) new possibilities, unveiling amazing ideas and inspiring unexpected ideas. According to (Prasetiyo et al, 2014: 66), to assess the ability to think creatively using references made and according to (Munandar, 2009: 87) which suggests that the ability to think creatively is formulated as an ability that reflects the following aspects: a. Fluent thinking or fluency that causes a person to be able to spark many ideas, answers, solutions or questions. b. Flexible thinking or flexibility that causes a person to be able to produce ideas, answers or questions that vary. c. Original thinking that causes a person to be able to give birth to new and unique expressions or to be able to find unusual combinations of ordinary elements. d. Elaboration ability that causes a person to be able to enrich and develop an idea.

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Learning Physics is part of the natural sciences. Natural sciences are classically divided into two parts, namely (1) physical sciences whose objects are substances, energy, and transformations of substances and energy, (2) biological sciences whose objects are living things and their environment (Kemble, 1966: 97). Given the importance of the role of physics, teachers must prepare their students in the process of forming and developing abilities in the field of science, adapting to changes entering the technological era and directing students to become active learners. As a successor to the nation's survival, students must be formed and prepared to understand various concepts, principles, science processes, and their applications through direct learning experiences in the hope that students can apply science in the real world.

Unlike what the curriculum expects, in fact, physics learning in class seems monotonous because students are used as learning objects so that they are not directly involved in the real learning context. If in the process students are subjects in learning and process orientation is on the side of students then all this will be more meaningful.

Based on the results of a previous study entitled "Profile of Creative Thinking Ability in Physics of Junior High School Students (Almuharomah and Mayasari, 2018)

described the achievement of aspects (Fluency) of 39.20% is the indicator with the lowest percentage, flexible thinking (Flexibelity) gets the highest score of 71.70%, original thinking (Originality) of 67.50%, and detailed thinking (Elaboration) of 43.10%. The results of the study are included in the sufficient category. Students' creative thinking skills can be improved using project-based learning models (Navies, Luthvitasari, et al. 2013). The purpose of this study was to determine the profile of creative thinking ability of SMPN 10 Teluk Keramat students on the physics material of Changes in the Form of Objects.

METHOD

The method used in this study is a descriptive method because this research is reviewing or describing the existence in the environment. This assessment aims to determine the process of student thinking, namely the creative thinking process in solving project-based science learning problems. Based on the student's answer data, it is used as a starting point for searching about the student's creative thinking process.

The variable in this study is the ability to think creatively which is measured through a written test in the form of essay questions. The 4 indicators of creative thinking are developed into 4 questions where each question represents one indicator so that there are 4 questions. Each question is scored with a score of 1-4 with their respective criteria per indicator. Furthermore, the scores of student answers are calculated on average, maximum scores and standard deviations and the results are used as a reference to group students' creative thinking skills into very less predicates, until it is sufficient according to (Purwanto, et al, 2009) as follows:

86 – 100% = Excellent
76 – 85% = Good
60 – 75% = Sufficient
55 – 59% = Less
≤ 54% = Very Less

Furthermore, an average analysis of each indicator is carried out to determine the achievement of each indicator on the creative thinking ability of students, the steps are as follows: (1) questions are given to students to complete material on changing the form of objects, (2) examine the results of student work, (3) the results of student work are grouped by categories Very Good, Good, Enough, Less, and Very Lacking. The subjects of this study were grade VII students of SMPN 10 Teluk Keramat in the 2020/2021 academic year classes A and B totaling 56 students consisting of 26 male students and 30 female students. Class VII was chosen as the subject of research because the material for changing the form of objects was in that class. The research was carried out in the even semester of the 2020/2021 academic year.

RESULTS AND DISCUSSION

Result

Student Creative Thinking Data.

Student creative thinking data is obtained through student creative thinking tests in the form of essay questions. Data on the learning outcomes of creative thinking are described in table 1, and it can be seen that students get an average of 17.3 or (54.07%). From table 2, students' creative thinking ability can be categorized into 4, and it can be seen that only 9 students who enter the category are enough. Less, there are 20 people. Others are in the less and very less categories. The results of the achievement of students' creative thinking skills are included in the category of lacking. Therefore, the creative thinking ability of students needs to be improved again in the learning process. The ability to think creatively of students can also be seen from each indicator.

Table. 1. Descriptive Student Creative Thinking Score

Value	Size
Average Score	17,3 (54,07%)
Standard Deviation	2,1
Score Maximum	32

Table 2. Students' Level of Creative Thinking Ability

Categories	Amount	Percentage
Enough	9	16.07 %
Less	7	12.50 %
Very Less	40	71.43 %

Table 3. Average Score of Each Indicator of Students' Creative Thinking Ability

Indicator Creative Thinking	Average Score	Percentage	Category
Fluency	4.16	52.01%	Very Less
Flexibility	4.29	53.57%	Very Lacking
Originality	4.57	57.14%	Less
Elaboration	4.29	53.57%	Very Lacking

Discussion

From the data, it was obtained that the best result of the student's creative thinking ability indicator was the Originality indicator with an average score of 4.57 or 57.14%. Judging from the grid of questions measured, students are unable to understand the ideas they spark in solving problem problems. Very lacking results were found in the Fluency indicator with an average score of 4.16 or 52.01%, Flexibility with a score of 4.29 or 53.57% and the Elaboration indicator with a score of 4.29 or 53.57%. When viewed from the grid of questions measured, students are unable to build ideas / ideas and are unable to develop, add, enrich an idea so that it is difficult

to make statements with answers that are relevant to the information provided. It is necessary to investigate whether the cause of the low indicator is, whether because of difficult problems students are not used to compiling an answer based on the commands given.

The lack of results of the students' creative thinking test according to the results of the research can be caused because students are not used to doing questions that contain text or stories, or also questions whose motives are to analyze a problem around them. They only do simple questions without requiring an analysis to answer the question. Therefore, in the learning process, students need to be trained to do questions in the form of analysis or HOT questions so that students are accustomed to working on questions in the form of text or narrative that need to analyze when answering the questions.

Cover

The creative thinking ability of SMPN 10 Teluk Keramat students is 17.3 (54.07) out of a maximum score of 32. When viewed from the ability of students based on the indicators of *Fluency* of 4.16 (52.01%), *Flexibility* of 4.29 (53.57%), *Originality* of 4.57 (57.14%), *Elaboration* of 4.29 (53.57%). The results of the achievement of students' creative thinking skills are included in the category of lacking. Therefore, the creative thinking ability of students needs to be improved again in the learning process.

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