Identification of The Ability Level Creative Thinking Of Junior High School Students On Motion Materials

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Abstract. The purpose of this study was to determine the level of creative thinking of junior high school students in motion material. This research data collection method is to use the test and interview methods. The test used in this study used test questions. Quantitative descriptive analysis is the score of the results of each aspect of student creative thinking. Qualitative descriptive analysis to classify students' level of creative thinking. The results of the analysis of the ability to think creatively in this study indicate that the fluency aspect of the score reaches 57.94 in the low category; The value of the flexibility aspect reaches 35.58 in the very low category; The score for the authenticity aspect of 55.88 categories is low and the score for the elaboration aspect is 45.58 for the very low category. The level of creative thinking of students is still very low because the average score of the four aspects of creative thinking is 48.75. This study provides an overview of the level of creative thinking of students who are in the low and very low categories, so that teachers need to innovate in the learning process to improve the creative thinking aspects of student

1. Introduction
Creativity thinking is that the creativity of an idea is determined by its novelty and usefulness [1], or an alternative to creativity that has originality and effectiveness [2]. Creative thinking actually has every individual [3]. Four components of creative thinking indicators, namely: Fluency, Flexibility, Originality, Elaboration are Torrance identifie. Creative thinking is the ability to formulate problems, make assumptions, generate new ideas, and communicate results [4]. Creative thinking includes finding gaps, paradoxes, opportunities, challenges or things of concern which then look for new meaningful relationships by bringing up various kinds of possibilities (from different perspectives or other views), unusual or original possibilities, and details. to develop or enrich the existing possibilities [5].

Creativity has implications in every area of life, so that it becomes the top agenda in the world today [6]. Creative thinking that demands student activity and participation has become the center of attention of educators in the 21st century. In the learning process creative thinking can be done simultaneously as a higher order thinking skill[7]

Natural sciences is a subject given to junior high school students. In the current era of globalization, natural science is expected to improve students' creative thinking skills. This is in
accordance with the Regulation of the Minister of National Education Number 22 of 2006 concerning Content Standards [8].

Students' creative thinking skills can be identified by giving questions of natural science. Motion material in natural science subjects can be used in identifying students' creative thinking abilities [9]. The movement material chosen by the researcher to be used as research material, because the observation of the results of student exams, both national and semester exams at the school where the researcher conducted the research, was still low. The results of interviews with natural science teachers said that in the movement material students were not able to convey answers that came from their own thoughts, because they felt less confident. According to [10] creative thinking is a product of thought that is considered new or original and useful or adaptive, or an alternative to creativity that has originality and effectiveness [2]. If an exam is carried out, it is difficult to find answers that come from their own thoughts, because students always refer to the answers in the books prepared by the teacher. This indicates that students do not have creativity, namely the development of thinking from static to dynamic [11]. At the theoretical level, creative as a cognitive mechanism process and typologically can reveal various types of children's creative imagination [12].

Based on the above problems, the researcher aims to describe the level of creative thinking of junior high school class VIII students in learning motion material.

2. Materials and Methods

This research is a descriptive study conducted in junior high schools. Descriptive research describes what it is about a variable, symptom or condition [13].

2.1. Research subject

The subjects in this study were 68 junior high school students in South Konawe. The school selection was obtained by means of the proportional random sampling technique, from several junior high schools in South Konawe Regency.

2.2. Research Instrument

The research instrument used tests and interview sheets. The test is used to determine the results of students' creative thinking. The test used in this study used a test item consisting of 4 questions with the indicators to be achieved, namely measuring student learning outcomes in science learning in four aspects of creative thinking. Determination of test reliability and the reliability of the respondents to the test, the Rasch model was used through the Winstep program then the instruments were categorized as in Table 1 and Table 2.

| Table 1. Classification of the value of Person and Reliability item |
|---------------------|---------------------|
| Value of Person Reliability | Classification |
| < 0,67               | Lame               |
| 0,67 - 0,80         | Enough             |
| > 0,80 - 0,90       | Good               |
| 0,91 - 0,94         | Very good          |
| > 0,94              | Excellent          |

Source [14]

| Table 2. Classification of Cronbach's alpha values |
|---------------------|---------------------|
| Value of \(\alpha\)  | Classification |
| < 0,5               | bad               |
| 0,5 - 0,6           | ugly              |
| 0,6 - 0,7           | enough            |
| 0,7 - 0,8           | Good              |
| > 0,8               | Very Good         |

Source [14]
The interview sheet is used to complete the data needed by the researcher and to find out the difficulties of students in doing the test.

2.3. Data collection
The data collection method in this study is to use the test and interview methods. Data collection by interview method, used a combination interview type. This interview was conducted after the results of the analysis of the students' creative thinking ability tests were obtained by randomly selecting students from each creative thinking ability. The purpose of this interview is to complete the data needed by the researcher and to find out the difficulties of students in doing the test.

2.4. Data analysis
The data analysis in this research is descriptive quantitative and qualitative analysis. The quantitative descriptive analysis in this research is the result of the percentage of each student's creative thinking ability level. Qualitative descriptive analysis in this study is to classify the level of creative thinking abilities of students. The steps to analyze the results of the student's creative thinking ability test are as follows: 1) Results, the test is given a score according to the scoring rubric of the creative thinking ability that has been made, the test results score for each aspect measured in the study, the measured aspects of creative thinking abilities are fluency, flexibility, originality and elaboration. 2) Measuring the ability to think creatively in each aspect (fluency, flexibility, originality and elaboration). For example, the level of ability to think creatively for each aspect is P.

\[ P = \frac{A}{B} \times 100 \]

Information:
A: the total score per aspect obtained by students;
B: the maximum number of scores for each aspect.

Furthermore, they will be categorized according to the categories in Table 3.

| Percentage      | Category    |
|-----------------|-------------|
| 90,00 ≤ P ≤ 100 | Very high   |
| 80,00 ≤ P < 90,00 | Very high   |
| 65,00 ≤ P < 80,00 | Medium      |
| 55,00 ≤ P < 65,00 | Low         |
| P < 55,00       | Very low    |

Tabel 3. Konversi Skor

Finding the percentage for each category of the level of creative thinking skills according to the following calculations:

\[ R_i = \frac{n_i}{N} \times 100 \%

Information:
Ri: percentage of respondents (students) in the category of creative thinking ability level i
ni: the number of respondents (students) in the category of creative thinking ability level i,
N: number of respondents (students) research.

Data analysis was also carried out by taking into account fluency, flexibility, novelty and elaboration. The analysis was carried out on the answers or method of completion used by students. From the results of the analysis, it can be seen that the percentage of students who meet level 4, level 3, level 2, level 1 and level 0.

Calculate the percentage of the number of students at each level using the following formula:

- Level 4 (Very creative) or Level of Creative Thinking Ability 4 (LCTA 4)
the number of students in the very creative category

\[ \frac{\text{the number of students in the creative category}}{\text{the total number of students}} \times 100\% \]

- Level 3 (Creative) or Level of Creative Thinking Ability 3 (LCTA 3)

\[ \frac{\text{the number of students in the creative category}}{\text{the total number of students}} \times 100\% \]

- Level 2 (Quite creative) or Level of Creative Thinking Ability 2 (LCTA 2)

\[ \frac{\text{the number of students in the category is quite creative}}{\text{the total number of students}} \times 100\% \]

- d. Level 1 (Less creative) or Level of Creative Thinking Ability 1 (LCTA 1)

\[ \frac{\text{the number of students in the less creative category}}{\text{the total number of students}} \times 100\% \]

- e. Level 0 (Not creative) or Level of Creative Thinking Ability 0 (LCTA 0)

\[ \frac{\text{the number of students in the non - creative category}}{\text{the total number of students}} \times 100\% \]

3. Result and Discussion

3.1. Results of the test instrument analysis

After testing the instrument using the Rasch model through the Winstep program, it is obtained that the Person reliability is 0.61 and the item reliability is 0.94. This means that the consistency of students' answers is weak, but the quality of the questions is special. The interaction between the person (student) and the item as a whole can be seen from Cronbach's alpha which is 0.58.

![Figure 1](image-url)  
Figure 1. Summary Statistics (Reliability of respondents and items)
3.2. Test results

The results of the creative thinking test on the four aspects of creative thinking can be seen in Figure 2.

![Figure 2. Graph of the average score of learning outcomes in the four aspects of creative thinking](image)

The percentage of student test results to measure the students' creative thinking aspects can be seen in Figure 3 below.

![Figure 3. The graph of the percentage of categories of test results on questions measures students' creative thinking](image)

The test results obtained identification data of students' creative thinking levels as follows: there are 9 subjects (13.2%) included in the creative thinking ability level 0 (not creative); there are 14 subjects (20.6%) included in creative thinking ability level 1 (less creative); there are 9 subjects (13.2%) included in creative thinking ability level 2 (creative enough); there were 26 subjects (38.3%) included in creative thinking ability level 3 (creative); there are 10 subjects (14.7%) included in creative thinking ability level 4 (very creative).

Graphically, the percentage of students' creative thinking levels can be seen in Figure 4 below.

![Figure 4. Percentage of students' creative thinking level](image)

4. Discussion

The purpose of this study was to identify the level of creative thinking of junior high school students in science learning in motion material. The results of the findings show that students still have a low level of creative thinking, because the average score for the four aspects of creative thinking is 48.75,
which is a very low category. Creativity has a very low relationship with or is negatively related to academic achievement [16][17]

Based on the research obtained as above, it can be discussed that students think creatively at different levels. The level of creative thinking skills of students is as follows: Students who are included in the creative thinking ability level 0 are students who do not meet the four indicators of creative thinking, namely fluency, flexibility, novelty and elaboration. There are humans whose creativity is hindered a lot or to some extent [18]. The characteristics of students obtained from the results of the interviews are that students cannot find another way when they have found a solution in one way and are not careful in solving the questions. Students do not meet the fluency criteria because students cannot provide answers to various and correct questions. In addition, the flexibility criteria were also not met because students could not solve the problems in any other way. Students also do not meet the novelty criteria because students cannot answer questions in a way that is unusual or rarely found by students of their age.

Students who are included in the creative thinking ability level 1 are students who meet one of the indicators of creative thinking. The reason for this student was obtained from the results of the interview, namely that the student could not provide examples of motion, so the answers obtained were not correct. In the questions, students are encouraged to give examples of regular straight motion in everyday life, but students answer by mentioning the theory of regular straight motion like the text in books. The results of interviews with students said that the students did not know, because they did not remember what the teacher modeled during the learning process. According to [19] learning concentration is needed in developing students' creative thinking. In addition, according to [20] creativity as part of children's education that requires a stimulus for the development of the next student's creativity and life experiences influence the development of student creativity.

Students who are included in creative thinking ability level 2 are students who fulfill two indicators of creative thinking. For example, students meet the criteria for novelty and fluency. The ability of students to answer questions in a way that is unusual or rarely found by students their age is called novelty. According to [21], there is a positive correlation between originality creative thinking and the ability to describe the complexity of an event or event. In addition, according to [22] implementing innovative education and involving students in the learning process can develop students' creative thinking.

Students who are included in creative thinking ability level 3 are students who meet the three indicators of creative thinking. The characteristics of students obtained from the results of the interviews were that students could solve the problems in other ways, but it was not appropriate to apply the formula, so that the final results obtained by students were wrong. The flexibility criteria have not been met because students cannot solve the questions in a different way. In solving the questions, students have met the fluency and novelty indicators. The novelty indicator is fulfilled because students are able to find various kinds of movements correctly. Meanwhile, the novelty indicator is fulfilled because students are able to use unusual ways [23]

Students who are included in the creative thinking ability level 4 are students who meet the four indicators of creative thinking. Characteristics of students obtained from the results of interviews are students can solve problems in other ways. Students meet the fluency criteria because students can provide answers to various and correct questions. In addition, the criteria for flexibility were also met because students could solve the questions in different ways. Flexibility relates to adaptation problems and creative idea creation, so that the limitations associated with inflexibility can be overcome [24].

Students also meet the novelty criteria because students can answer questions in a way that is unusual or rarely found by students of their age. In solving the questions, students have met the four indicators, namely fluency, flexibility, novelty, and elaboration. Motor creativity and creative thinking (fluency, flexibility, originality and elaboration) have a significant relationship between creative movement and thinking for all dimensions [25], this is reinforced by the opinion of [26], that creativity has a significantly stronger relationship with academic achievements.
5. Conclusion

Based on the results of data analysis and discussion, it can be concluded that creative thinking in this study obtained a score for the aspect of fluency reaching 57.94 in the low category; The score for the flexibility aspect reaches 35.58 in the very low category; The originality aspect score reached 55.88 for the low category and the elaboration aspect score reached 45.58 for the very low category. The average score of learning outcomes in the four aspects of creative thinking can be seen in Figure 1. The average score of the four aspects of creative thinking is 48.75, so it can be said that the level of students’ creative thinking on motion material is still very low category.

In addition, the results of students' creative thinking tests were grouped into several categories, as many as 7.35% of students were at the very high category level, 10.29% of students were at the high category level, 27.94% of students were at the moderate category level; 22.06% of students were at the low category level, and 33.82% of the students were in the very low category out of a total of 68 students. Thus it can be concluded that the category of students’ creative thinking on motion material is still low is the largest percentage category.

Identification of the level of creative thinking of grade VIII students from four junior high schools in South Konawae Regency, as follows. : There are 9 subjects (13.2%) included in the creative thinking ability level 0 (not creative). Students who are included in the creative thinking ability level 0 are students who do not meet the four indicators of creative thinking, namely fluency, flexibility, novelty, and elaboration; There are 14 subjects (20.6%) included in creative thinking ability level 1 (less creative). Students who are included in creative thinking ability level 1 are students who meet one indicator of creative thinking; There are 9 subjects (13.2%) included in creative thinking ability level 2 (creative enough). Students who are included in LCTA 2 are students who meet two indicators of creative thinking; There were 26 subjects (38.3%) included in creative thinking ability level 3 (creative). Students who are included in creative thinking ability level 3 are students who meet the three indicators of creative thinking; There are 10 subjects (14.7%) included in creative thinking ability level 4 (very creative). Students who are included in creative thinking ability level 4 are students who meet the four indicators of creative thinking, namely fluency, flexibility, novelty, and elaboration.

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