



## Analysis of Students' Ability to Work on Higher Order Thinking Skills in Thematic Science Learning

Putri Rahmadhani<sup>1</sup>, Ricky Purnama Wirayuda<sup>2</sup>

<sup>1</sup>Faculty of Teaching and Education, Universitas Jambi, Jambi, Indonesia

<sup>2</sup>Alhidayah Islamic Foundation teacher, Kebon IX, Jambi, Indonesia

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### Article Info

#### Article history:

Received Jan 1, 2023

Revised Jan 17, 2023

Accepted Jan 25, 2023

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#### Keywords:

Elementary School  
Higher Order Thinking Skills  
Thematic

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### ABSTRACT

**Purpose of the study:** This study aims to look at students' abilities in working on HOTS (Higher Order Thinking Skills) questions in science learning at Madrasah Ibtidaiyah Al-Hidayah Kebon IX Muaro Jambi

**Methodology:** This study uses a quantitative descriptive research design. The population of this study was class V Madrasah Ibtidaiyah Al-Hidayah Kebon IX, which consisted of 2 classes, namely class VA and class VB. The total population in this study is 38 students. From the entire population, 22 VA class students were selected as a sample. The sampling technique used in this study was purposive sampling which, based on criteria had applied HOTS (Higher Order Thinking Skills) questions to science learning.

**Main Findings:** The ability of Madrasah Ibtidaiyah Al-Hidayah Kebon IX students in working on Higher Order Thinking Skills questions in science learning is in a fairly good category.

**Novelty/Originality of this study:** With this research, it can be useful for teachers to find out how far students' abilities are in working on Higher Order Thinking Skills questions, especially in learning mathematics and teachers can also improve students' abilities to work on Higher Order Thinking Skills questions which are at the level of analyzing, evaluating, and creating.

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#### Corresponding Author:

Ricky Purnama Wirayuda,  
Alhidayah Islamic Foundation teacher, Kebon IX, Jambi, Indonesia  
Email: [pwricky27@gmail.com](mailto:pwricky27@gmail.com)

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### 1. INTRODUCTION

In 21st-century education, more emphasis is placed on creative young people, able to make good decisions and capable of critical thinking. In line with this, 21st-century learning also requires students to find out from various sources, think analytically, formulate problems and collaborate in solving a problem [1], [2]. Therefore, it is expected to be able to build and produce good quality human resources from cognitive, psychomotor, and affective aspects.

In addition to the cognitive, psychomotor, and affective abilities that need to be developed, students are expected to be able to develop their social skills, such as being able to negotiate, being reliable in working together and being able to work efficiently [3]. The challenges in 21st-century education are character, while the learning skills needed in 21st-century education are the ability to think critically, creatively, collaborate and communicate, where the ability to think is achieved through the senses by receiving information stored in the brain [4], [5]. Thus, teachers are expected to be able to develop learning that can improve students' higher-order thinking skills or what is known as Higher Order Thinking Skills [6], [7].

Higher Order Thinking Skills HOTS is an ability that supports students to think critically, creatively, and analytically and be able to solve a problem [8], [9]. In line with the opinion expressed by [10], which states

that "Higher-order thinking skills will stimulate students to analyze or manipulate previous information so that it is not monotonous". That way, students are expected to be able to deepen the concepts they acquire, generate new ideas, communicate ideas and ideas, and work together in solving a problem they face.

Based on the opinion [11], [12] states that "The levels for assessing higher order thinking skills are: analyzing (C4), evaluating (C5), and creating (C6)". Therefore, higher-order thinking skills are not just remembering skills but also require analyzing, evaluating, and creating skills. One application to foster higher-order thinking skills is by conducting tests in the form of Higher Order Thinking Skills questions given to students to know how much students are capable of solving problems and understanding the questions given [13]-[15]. Based [16] states that Higher Order Thinking Skills questions are an instrument that assesses students' high-order thinking skills so that students do not just remember or restate, but students are expected to be able to develop their ideas and ideas. Science learning is one of the lessons tested in Higher Order Thinking Skills questions.

Science is a compulsory subject at the elementary school level. Natural science is the knowledge that involves dealing with material in life, all of which can be scientifically proven that learning involves experimentation, observation, and testing [17]. Even though science is a subject that is fun for some students, for those who don't enjoy it, it's a subject that is considered difficult because they have to go through a series of processes to understand it. Understanding the concept of learning is very important to determine how students understand learning according to educational goals [18]. Conceptual understanding is a measure of learning success because students will be faced with problems that must be solved to train students critical and scientific thinking skills [19], [20].

Based on the background of this problem, the researcher is interested in conducting research that aims to see the Ability of Class V Students to work on Higher Order Thinking Skills Questions in Learning at Madrasah Ibtidaiyah Al-Hidayah Kebon IX Muaro Jambi.

## 2. RESEARCH METHOD

This study uses a quantitative descriptive research design. Descriptive research intends to see the actual situation in the field without any treatment of the research object [21]. The purpose of the descriptive research in this study was to measure the level of students' ability to work on HOTS (Higher Order Thinking Skills) questions in science learning in class V Madrasah Ibtidaiyah Al-Hidayah Kebon IX by describing test results regarding students' ability to work on HOTS (Higher Order Thinking) questions. Skills) in the form of quantitative data.

The population of this study was class V Madrasah Ibtidaiyah Al-Hidayah Kebon IX, which consisted of 2 classes, namely class VA and class VB. The total population in this study is 38 students. From the entire population, 22 VA class students were selected as a sample. The sampling technique used in this research is purposive sampling which, based on criteria, has implemented HOTS (Higher Order Thinking Skills) questions in science learning, such as being able to process and apply information, being able to find links from different types of information, being able to use the information to solve problems. problems, and able to critically analyze ideas and information.

Data collection techniques in this study were obtained through measurements using research instruments in the form of tests. Tests are selected to obtain data in scores or numbers, which will then be processed. The test instrument grid used is.

HOTS Question Level	Total
Analyze (C4)	5
Evaluation (C5)	5
Create (C6)	5

After making a test instrument grid consisting of 15 questions in the form of an essay, the essay questions were chosen to be able to further explore students' creativity and critical abilities in solving HOTS questions which consisted of 5 questions for the analyzing level (C4), 5 questions for the evaluating level (C5), and 5 questions for the creative level (C6). That way, the next step for researchers to make a score with a range of scores according to Riduwan, 2010 is as follows:

Table 2. Vulnerable Question Assessment Categories

Interval	Category
85.0 – 100.0	Very High (ST)
70.0 – 84.9	High (T)
55.0 – 69.9	Enough (C)
40.0 – 54.9	Low (R)
0.0 – 39.9	Very low (SR)

### 3. RESULTS AND DISCUSSION

Data collection in this study used instruments in the form of tests of students' ability to work on HOTS (Higher Order Thinking Skills) questions in science learning. The test questions in this study are in the form of essays. The test questions used consist of 3 levels, namely the level of analyzing (C4), evaluating (C5), and creating (C6).

Based on research on students' ability to work on HOTS (Higher Order Thinking Skills) IPA level analyzing questions, the following data were obtained:

Table 3. Results of Descriptive Statistical Analysis about the level of analysis

Interval	Category	F	%	Mean	Median	Modus	Min	Max
85.0 – 100.0	ST	5	22%					
70.0 – 84.9	T	9	41%					
55.0 – 69.9	C	1	0,4%	67,77	75,00	80,00	35,00	95,00
40.0 – 54.9	R	5	22%					
0.0 – 39.9	SR	2	10%					

Based on the analysis of data from student answer sheets at the level of analyzing questions, the mean data was obtained at 67.77, the median value was 75.00, the mode value was 80.00, the minimum value was 35.00, and the maximum value was 95.00. Total respondents were 22 students and students were found to be in the very low category with a percentage of 10% with a total of 2 students. In the low category, there were 2 people with a percentage of 22%, students who were in the sufficient category were 1 person with a percentage of 0.4% and students who were in the high category were 9 people with a percentage of 41%, students who were in the very category as many as 5 people with a percentage of 22%. The results of the analysis of the ability to work on HOTS (Higher Order Thinking Skills) questions at the level of analyzing students showed that the ability to work on HOTS (Higher Order Thinking Skills) questions at the level of analyzing students was classified as high. This can be seen from the results of the percentage of ability to work on HOTS (Higher Order Thinking Skills) questions with the level of analyzing students in the high category of 41%. Furthermore, the percentage of ability to work on HOTS (Higher Order Thinking Skills) questions with an evaluating level can be seen in Table 4.

Table 4. Results of Descriptive Statistical Analysis about evaluating levels

Interval	Category	F	%	Mean	Median	Modus	Min	Max
85.0 – 100.0	ST	1	0,4%					
70.0 – 84.9	T	3	13%					
55.0 – 69.9	C	10	45%	61,81	65,00	65,00	30,00	90,00
40.0 – 54.9	R	7	32%					
0.0 – 39.9	SR	1	0,4%					

The ability of students to work on HOTS Science questions with an evaluating level is that students are required to assess something and make decisions for a purpose. The ability of students to work on HOTS (Higher Order Thinking Skills) questions with an evaluating level obtained a mean data of 61.81, a median value of 65.00, a mode value of 65.00, a minimum value of 30.00, and a maximum value of 90.00. students who fall into the very low category are 1 student with a percentage of 0.4%. low is as many as 7 people with a percentage of 32%, students who are in the sufficient category are 10 people with a percentage of 45% and it is found that students who are in the high category are as many as 3 people with a percentage of 13%, students. The results of the ability analysis in working on HOTS (Higher Order Thinking Skills) questions with an evaluating level show that the student's level is classified as Adequate. This can be seen from the results of the percentage of ability to work on HOTS (Higher Order Thinking Skills) questions with the level of analyzing students in the Enough category of 45%. Furthermore, the percentage of ability to work on HOTS (Higher Order Thinking Skills) questions with a creative level can be seen in Table 5.

Table 5. Results of Descriptive Statistical Analysis about the level of creation

Interval	Category	F	%	Mean	Median	Modus	Min	Max
85.0 – 100.0	ST	3	13%					
70.0 – 84.9	T	5	22%					
55.0 – 69.9	C	10	45%	65,00	65,00	65.00	30.00	95.00
40.0 – 54.9	R	3	13%					
0.0 – 39.9	SR	1	0,4%					

The ability of students to work on HOTS Science questions at the level of creation, namely students; students are required to organize various information through new or different strategies from before. At the level of creating questions, the lowest score obtained by students was 30.00, with a very low category obtained by 1 student. The highest score obtained by students is 95.00, with a very high category obtained by 3 students. The analysis of the ability to work on HOTS (Higher Order Thinking Skills) questions at the creative level show that the students' level is quite high. This can be seen from the results of the percentage of ability to work on HOTS (Higher Order Thinking Skills) questions with the level of analyzing students in the very low category, as many as 1 student with a percentage of 0.4%, in the low category as many as 3 students with a percentage of 13%, in enough as many as 10 students with a percentage of 45% and at a high level of 22% with a total of 5 students, while at a very low level, it shows a percentage of 0.4% with 3 students.

This discussion will be discussed regarding the results of the data analysis that has been done. The ability of students to work on HOTS (Higher Order Thinking Skills) questions in science learning in class V Madrasah Ibtidaiyah Al-Hidayah Kebon IX was obtained from tests that were arranged based on the three levels contained in the Higher Order Thinking Skills questions, namely analyzing, evaluating, and create. The number of Higher Order Thinking Skills science items consists of 15 items, each level consisting of 5 items. The form of the questions used in the ability test to work on Higher Order Thinking Skills questions is an essay. As for the test questions, there are Basic Science competencies for class V in the 2013 curriculum, which are developed into several indicators.

After conducting research using students' ability tests to work on Higher Order Thinking Skills questions in science learning, the test results were processed quantitatively to find exact figures related to students' ability to work on Higher Order Thinking Skills questions in science learning based on the three-question levels. The results of the ability to work on Higher Order Thinking Skills questions at the level of analyzing students showed that the ability to work on Higher Order Thinking Skills questions at the level of analyzing students was classified as high. This can be seen from the percentage of ability to work on Higher Order Thinking Skills questions with the level of analyzing students in the high category of 41%. Furthermore, the ability to work on Higher Order Thinking Skills questions with an evaluating level shows that the student's level is classified as sufficient. This can be seen from the results of the percentage of ability to work on HOTS (Higher Order Thinking Skills) questions with the level of analyzing students in the Enough category of 45%.

Based on the results of the analysis of the ability to work on Higher Order Thinking Skills questions at a creative level, it shows that the student's level is quite high. This can be seen from the results of the percentage of ability to work on Higher Order Thinking Skills questions, with the level of analyzing students in the Enough category of 45% and at a high level of 22%. The results obtained by the researchers have shown that the analysis of students' abilities in working on Higher Order Thinking Skills Science questions are in the fairly good category, which can be seen from the percentage of students getting high and sufficient percentages, including high. These results indicate that classroom learning is in accordance with the demands of the K13 curriculum used in Madrasah [22], [23]. High HOTS (Higher Order Thinking Skills) skills will help students become more successful in the future and also be able to make a positive contribution to many people [24], [24].

With a description or description of students' abilities to work on Higher Order Thinking Skills questions in science learning in class VA Madrasah Ibtidaiyah Al-Hidayah Kebon IX should be able to motivate teachers to further improve students' abilities in working on HOTS (Higher Order Thinking Skills) questions. ) especially in science learning which consists of 3 levels of HOTS questions. The teacher can provide training in the form of Higher Order Thinking Skills questions continuously so that students are trained and accustomed to working on Higher Order Thinking Skills questions so that students can support their abilities in higher-order thinking [25]. Higher Order Thinking Skills questions are needed, especially in the 2013 curriculum, which requires students to be able to think at a higher level [26]. For this reason, the teacher's role is very important in supporting students' higher-order thinking skills so that learning objectives can be achieved properly.

With this research, it can be useful for teachers to find out how far students' abilities are in working on Higher Order Thinking Skills questions, especially in science learning, and teachers can also improve students' abilities to work on Higher Order Thinking Skills questions found in analyze, evaluate, and create levels. Students will be able to work on Higher Order Thinking Skills questions if the teacher has implemented Higher Order Thinking Skills learning and makes it a habit to provide practice in the form of Higher Order Thinking Skills questions so that students have no difficulty in working on Higher Order Thinking Skills questions [27]

[28]. However, some students still have difficulty working on HOTS questions due to students' lack of understanding of Higher Order Thinking Skills questions [29]. Therefore, there is a need for teacher efforts to improve students' critical, creative thinking, and problem-solving skills in working on Higher Order Thinking Skills questions [30]. Thus, it is necessary to conduct research to determine the extent of students' abilities in working on Higher Order Thinking Skills questions. This research shows students' abilities working on Higher Order Thinking Skills questions.

From the results of the research that has been done, it is hoped that the teacher will further improve students' high-order thinking skills either through Higher Order Thinking Skills learning or also by training students by giving Higher Order Thinking Skills questions continuously so that students the easier it is to understand and be able to do the Higher Order Thinking Skills questions well.

#### 4. CONCLUSION

This study concludes that the teacher's strategy in instilling the practical values of Pancasila, especially the precepts of "Social Justice for All Indonesian People" in thematic learning in class I SDN 36/I Kilangan shows that the teacher has become a good example for students, especially in implementing a family attitude, balance between rights and obligations, and work hard. Teachers use several strategies such as asking for donations to visit friends who are sick to instill a socially caring attitude, giving warnings and coaching for students who violate Pancasila values and school rules, conditioning the learning environment, and integrating Pancasila attitude points into learning tools such as RPP, starting from the use of learning strategies and techniques that are routinely carried out every day in the thematic learning process. Instilling character values in learning is carried out through the stages of character formation. In the learning process the teacher uses several learning strategy efforts that are already loaded with character. The strategies that have been implemented include the PAIKEM strategy, cooperative learning and inquiry, as well as various lectures to familiarize students with always reading and discussing.

#### ACKNOWLEDGEMENT

Based on the discussion of research results and data analysis, it can be concluded that the ability of Madrasah Ibtidaiyah Al-Hidayah Kebon IX students in working on Higher Order Thinking Skills questions in science learning is in a fairly good category.

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