

# Analysis of Higher Order Thinking Skill (HOTS) Participants of Olympiad Geography

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## ABSTRACT

The National Science Olympiad (OSN) Geography is a prestigious event for high school / MA students or equivalent. The name of the school until personal pride is in the science competition. OSN Geography that is held has different levels of questions, but if it can be concluded is to have a medium to high cognitive level. The phenomenon in Pariaman City is that few students are able to break through the OSK stage to the Provincial Geography OSP level. This study aims to determine the level of higher order thinking skills of national science olympiad students in the City of Pariaman. This research method is a descriptive method with a quantitative approach. Indicators of higher order thinking skills used in this study use the framework of the revised Bloom C4, C5, and C6. The results showed that the high level of geography dream skills in Pariaman City were still in the low category. From the HOTS matter, the material tested on OSN geography shows that dreams have not been able to finish well. Higher order thinking (HOTS) in schools is not yet a learning culture. When viewed from its relevance to OSN Geography is very related, it is also needed.

**Keywords:** *Olympiad, geography, HOTS*

## 1. INTRODUCTION

Improving the quality of education is one of the important points mandated by the Law (Law) of the Republic of Indonesia No 20 of 2003 concerning the national education system. This is very easy to understand because the quality of education will be the spearhead for increasing the nation's competitiveness (nation competitiveness) in the face of global competition. The quality of education in various fields of science is essential to be improved because various indicators indicate the quality of education in Indonesia is still very low such as the Human Development Index, the TIMSS study, and reports on the results of final examinations both in schools and national examinations.

In line with the mandate of Law no. 30 of 2003, the quality of education was also outlined in government regulation (PP) No. 19. of 2005 concerning national education standards. In this PP it is emphasized the importance of the quality of education and its guarantee system which contains matters relating to national standardization of education. One of the government programs in education is to improve the quality of human resources. Various efforts to improve the quality of education have been carried out by the Indonesian government. The Ministry of Education and Culture organizes the National Science Olympiad (OSN) from various levels of education (Elementary School, Elementary School, and High School).

There are several fields of study that are contested in OSN, one of which is geography. The field of geography studies began to be contested in 2013. To reach OSN, geography olympiad participants must go through the olympiad selection stage at the district/city and provincial level. Participants who passed OSN will go through national training plates to be sent to represent Indonesia in the International Geography Olympiad (IGEO) event.

The thing to note in preparing students to take part in IGEO is that the curriculum of geography lessons at the secondary school level is not sufficient to cover the topics tested in IGEO completely and comprehensively. For this reason, geography material must be studied both from the current curriculum reference and from other possible and adequate reading sources. Also, students are required to have high-level thinking skills in solving questions that are tested in the geography olympiad.

Future challenges require learning, especially science learning to develop higher-order thinking skills, which are one component of 21st-century intelligence issues. Ironically, learning in reality there are still many that are oriented solely on efforts to develop and test students' memory so that students' thinking skills are reduced and simply understood as skills to remember (Harsanto, 2005).

High-level thinking skills of students are important to know because with high-level thinking skills students will be able to connect, manipulate, and transform their knowledge and experience in making decisions to solve problems in new situations. By knowing how high-level

thinking skills students have, teachers can find out which level students are at. Thus, the teacher as a teacher can use the information to improve the process of teaching and learning activities and can use the information to find solutions to improve students' higher-order thinking skills.

Pariaman city based on observations (2018-2019) participants of the Olympics were difficult to penetrate the next stage (from OSK to OSN Province). This can be interpreted that, students in the City of Pariaman have internal and external challenges. The development of optimal cadres is not optimal. External factors, other areas in West Sumatra increasingly improve in preparing students to participate in OSN selection to the highest level. These problems can be overcome in many ways, one of which is to train cognitive abilities to think at a high level that is expected to have become a learning culture.

The learning process of students at the level of high-level thinking ability is not merely memorizing and relaying information but can understand and apply the knowledge learned in school. Aspects of higher-order thinking skills in the physics learning process are reviewed in Bloom's revised taxonomy, including the ability to analyze (C4), evaluate (C5) and create (C6) (Anderson and Krathwol, 2002). To find out how high-level thinking skills need to be done in-depth study. Therefore, this study was conducted to describe the high-level thinking skills of geography olympiad participants in Pariaman.

**2. METHOD**

This research method is a descriptive method with a quantitative approach. The descriptive research method is used because in this study will describe the ability to think of high-level geography Olympics participants in completing higher-order thinking skills. Data analysis was performed using the average description method as an explanation of test results based on indicators of higher-order thinking ability.

This study analyzed the ability of high-level thinking (HOTS) geography olympiad participants at the district/city level in several Pariaman City High Schools. The instrument in this study is a matter of geography by the syllabus of the national science Olympics in the field of geography. Questions consist of 100 items concerning higher-level thinking indicators.

**3. RESULT AND DISCUSSION**

This study describes the higher-order thinking skills of participants in the Olympics in the field of geography. The students' high-level thinking skills were observed by researchers from the results of tests on geography by the syllabus of the national science Olympics in geography. Data on the results of the test results in each indicator of higher-order thinking skills are used as a basis for knowing students' abilities.

HOTS Analysis of Geographical Olympics Participants Based on Bloom's Taxonomy

High-level thinking is the ability to use the mind to manipulate information obtained as something that is understood by itself and is true. Higher-order thinking

ability is defined as the wider use of the mind to find new challenges. This ability to think at a higher level requires someone to apply new information or prior knowledge and manipulate information to reach possible answers. defines higher-order thinking abilities as follows: Higher-order thinking occurs when a person takes new information and information stored in memory and interrelates and/or rearranges and extends this information to achieve a purpose or find possible answers in perplexing situations. The ability to think at a higher level occurs when a person associates new information with information already stored in his memory and relates it and develops that information to achieve a goal or find a solution to a situation that is difficult to solve. Higher-order thinking skills are skills that can be trained.

As according to Krathwohl in A revision of Bloom's Taxonomy: an overview - Theory Into Practice states that indicators to measure higher-order thinking skills include:

Table 1. Bloom's Revised Taxonomy

<b>HOTS</b>	<b>C6</b>	<b>Create your own ideas / ideas.</b>
	C5	Make your own decisions.
	C4	Specifying aspects / elements.
<b>MOTS</b>	C3	Use information on different domains
	C2	Explain ideas / concepts.
<b>LOTS</b>	C1	Recalling.

(Anderson & Krathwohl, 2015)

The learning process that supports the development of higher-order thinking skills is needed in education to maximize the potential of students (Genç, 2016; Ghasempour, Kashefi, Bakar, & Miri, 2012; Murraya, 2011; Ramos, Dolipas, & Villamor, 2013). Ramos et al. (2013) state that the abilities included in the ability to think higher-level is the ability to think creatively and critically, analytically, and solve problems. That is, in the learning process students need to be directed to be able to categorize objects based on certain traits, compare and contrast ideas and theories, and be able to write and solve problems in class and apply them to problems in the real world. Furthermore, Ghasempour, et al (2012) emphasize the ability to think at a high level where not only memorize certain facts but more than that the ability to understand a problem, connect with existing theories, categorize, manipulate, and combine all information needed to solve a problem using a new method.

Higher-order thinking ability is defined as the wider use of the mind to find new challenges. As abstracted from Heong by Rofiah et al. (2013), this high-level thinking ability requires one to apply new information or prior knowledge and manipulate information to reach possible answers in new situations.

The following is a data table of the ability of dreams to answer questions based on the cognitive level.

Table 2. dream abilities based on a cognitive level

<b>No</b>	<b>Level</b>	<b>(%)</b>
<b>1</b>	C4	32,5
<b>2</b>	C5	27
<b>3</b>	C6	30

Based on the table above, the largest percentage of dreams in answering questions is at the C4 level, while C5 is at the lowest level. This is a new finding for researchers because, in concept, C6 has a higher level compared to C4 and C5. To more clearly see the comparison, here is a graph of the HOTS data based on cognitive levels (C4, C5, C6)

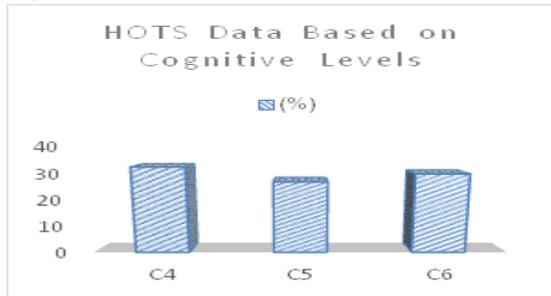


Figure 1. HOTS graph based on cognitive level  
HOTS Analysis of Geography Olympiad Participants Based on OSN Syllabus

The material tested in the national science Olympics in the field of geography consists of twelve topics. The twelve topics are: 1) Climate and Climate Change; 2) Disaster and Disaster Management; 3) Resources and Resource Management; 4) Environmental Geography and Sustainable Development; 5) Geomorphology and Land Use; 6) Agricultural Geography and Food Problems; 7) Population and Population Dynamics; 8) City Geography, City Rejuvenation, and Urban Planning; 9) Development Geography and Spatial Theory; 10) Tourism and Tourism Management; 11) Economic Geography and Globalization; 12) Cultural Geography and Regional Identity.

The following are research data based on OSN geography material:

Table 3. Participants abilities based on OSN material

No	Olympiad Topic	(%)
1	Climate and Climate Change	28
2	Disaster and Disaster Management	25
3	Resources and Resource Management	31
4	Environmental Geography and Sustainable Development	34
5	Geomorphology and Land Use	22
6	Agricultural Geography and Food Problems	33
7	Population and Population Dynamics	35
8	Urban Geography, City Rejuvenation, and Urban Planning	35
9	Development Geography and Kerungan Theory	33
10	Tourism and Tourism Management	23
11	Economic Geography and Globalization	30
12	Cultural Geography and Regional Identity	7

Based on the table above, it can be seen that the geography of Pariaman city has a high level of thinking ability which is low, it is known from the results of the Olympian answers that are still low in answering questions based on the material tested in OSN. The highest score of

35% was obtained on two materials tested from 12 materials, the first material was population and population dynamics and the second was urban geography, urban renewal, and city planning. While the lowest score is on cultural geography and regional identity material which is 7%. To more clearly see the comparison, here is a graph from the HOTS data based on the Olympic geography material.

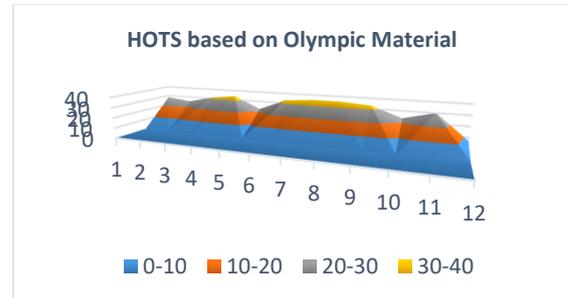


Figure 2. HOTS graph based on Olympic material

#### 4. CONCLUSION

The results showed that the high level of geography dream skills in Pariaman City were still in the low category. From the HOTS matter, the material tested on OSN geography shows that dreams have not been able to finish well. Higher order thinking (HOTS) in schools is not yet a learning culture. When viewed from its relevance to OSN Geography is very related, it is also needed in learning in the present.

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