



STUDENTS' LEARNING ABILITY IN WORKING ON HOTS (HIGHER ORDER THINKING SKILLS) IN MATHEMATICS LEARNING IN CLASS V SD NEGERI 040457 BERASTAGI

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Abstract

HOTS (Higher Order Thinking Skills) is an instrument that assesses students' high level thinking skills so that students are not just remembering but are expected to be able to develop ideas. Based on Bloom's Taxonomy, HOTS questions consist of 3 levels, namely analyzing, evaluating and creating. This study aims to describe the ability of students to work on HOTS (Higher Order Thinking Skills) problems in mathematics learning in V class SD Negeri 040457 Berastagi at the level of analyzing, evaluating, and creating. This research uses a descriptive quantitative research design. The data of this study were obtained using tests of the students' ability to work on HOTS questions in mathematics learning provided to students by using content validity, while data analysis was performed using descriptive statistical analysis. The results showed that the ability of V grade students of SD Negeri 040457 Berastagi in working on HOTS questions in mathematics learning at the level of analyzing questions was obtained on average by 56.35 with quite good categories. In the matter of evaluating level obtained an average of 73,3 with a high category, on the matter of creating level obtained an average of 65,65 with a pretty good category. The conclusion of this research is the ability of V class students of SD Negeri 040457 in working on HOTS questions in mathematics learning is in quite good category, meaning that students are able to work on HOTS questions in mathematics learning.

Keywords: *HOTS questions, Mathematics Learning*

A. Introduction

Education is the most important aspect in building quality human resources from both cognitive, psychomotor, and affective aspects. The purpose of education is to form human resources who are moral, creative, innovative, and productive. The government is always trying to improve the quality of education so that human resources can increase and be able to compete with other developed countries. One way the government has done to improve the quality of education for the better is by implementing the 2013 Curriculum. With this curriculum, there must be preparation for developing critical, creative, communicative, collaborative and wise thinking skills in making decisions. That way, students are expected to be able to improve their skills in higher order thinking (HOTS). Higher order thinking ability (HOTS) is an ability that supports students to think critically, creatively, analytically, and be able to solve a problem. 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. 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 skills in analyzing, evaluating, and creating. Higher order thinking skills are not only enhanced in cognitive aspects but are able to improve students' skills and affective aspects.

One of the learning objectives that can be achieved is that students are able solve math problems, in this case are HOTS type questions. Higher Order Thinking Skills (HOTS) is a series of processes in thinking by students from higher cognitive level (Manik et al., 2020).

Unaccustomed students in solving problems at a high level of thinking causes low ability students in thinking (Rudyanto et al., 2019). Students who are able to solve problems HOTS besides being able to remember the formulas learned, also understand the material, and apply it to math problems (Fauzia et al., 2015). aside from that able to analyze mathematical problems that have been given by the teacher (Winarso, 2014). Therefore it is hoped that with HOTS questions it can train and encourage students to think specifically and use thinking skills students (Suyitno, 2020).

HOTS (Higher Order Thinking Skills) questions are an instrument that assesses students' higher 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. Therefore, HOTS questions invite students to explore existing concepts and solve a problem. Regarding the thinking skills that are measured, HOTS questions are used to assess analytical thinking skills (C4), evaluate (C5), and create (C6). One of the lessons tested in HOTS questions is learning mathematics.

In the observation results of SD Negeri 040457 Berastagi that teachers at the school have applied HOTS questions to learning mathematics. However, there are still students who have difficulty working on HOTS questions both at the level of analyzing, evaluating and creating. This is because students do not understand the HOTS questions. Based on the background of this problem, the researcher is interested in conducting research entitled "Student Learning Ability in Working on HOTS (Higher Order Thinking Skills) Questions in Mathematics Learning in Class V SD Negeri 040457 Berastagi".

B. Method

This research is classified as a descriptive research type. Descriptive research carried out was not aims to find relationships between variables or test hypotheses. This research has only one the independent variable is the ability to think at a higher level. The sampling technique used in this study is the saturated sampling technique which is a sampling technique with using the entire population as research subjects. Then the sample of this study has a number which is the same as the population, namely 100 students of class V SD Negeri 040457 Berastagi Academic Year 2012/2023.

Data collection on the entire population was carried out through descriptive test instruments and interviews. The test instrument used was HOTS questions in mathematics, which consisted of 5 question item. Student answer sheets are assessed using an assessment rubric with the highest score being 100.

C. Finding and Discussion**1. Finding**

The process of analyzing, evaluating and creating is part of the cognitive taxonomy created by Benjamin S. Bloom in 1956. In the end it was refined again by Anderson and Krathwohl (2001) into C1-remembering, C2-understanding, C3-applying, C4-analysing, C5-evaluate (evaluate), and C6-creation (create).

Tanujaya (2017: 78) explains that levels one to three are lower order thinking skills or LOTS (Lower Order Thinking Skills) and levels four to six are HOTS (Higher Order Thinking Skills). So if viewed from the cognitive domain HOTS is the ability to analyze, evaluate and create.

Table 1. HOTS Cognitive Levels and Cognitive Indicators

Aspect	Cognitive Level and Indicators	Definition
Think Critical	C4- Analyze	The process of breaking down the material which then seeks its relation as a whole
	Differentiate	Able to sort information into relevant and irrelevant
	Organize	Be able to identify information into a structure organized
	Artibute	Be able to determine the pattern of relationships between parts of each information structure
	C5 – Evaluating	The activity of making a decision based on predetermined criteria and standards.
	Inspect	Able to check and determine the wrong part of a process or a statement
	Cticize	Able to accept and reject information through predetermined criteria

Creative thinking and problem solving	C6 – Creating	Form a solution or something new from the activity combines various elements
	Formulate	Be able to provide a perspective on an issue
	Plan	Able to design a way to solve the problem
	Produce	Able to make ideas, solutions or decisions from previously made designs

2. Discussion

Through the results of a study by Azizah (2018) stated the activity of analyzing higher-order thinking skills is a solution to describe students' HOTS abilities. The development of students' higher-order thinking skills can also be pursued through this analytical activity, according to a study by Wiwin (2017). As was the result of a study by Intan & Kuntarto (2020) which found the high-level thinking skills of fifth grade students at SD Negeri No.55/I Sridadi were in the sufficient category with an average score obtained of 64.77. These results also show that students' abilities are still low in the C6 cognitive domain (creating). The study obtained results in the same category as in this study, namely the high-level thinking skills of fifth grade elementary school students in answering HOTS questions in mathematics were in the sufficient category and the low ability of students in answering questions in the cognitive domain C6 (creating).

TABLES, FIGURE, AND EQUATION

Table 1. Research Category

Score	Category
85,00-100,00	very high
70,00-84,99	high
55,00-69,99	enough
40,00-54,99	low
0,00-39,99	Very low

Tabel 2. Data on Students' Ability to Work on HOTS Questions

No	Student's Name	Levels			Total	Grade	Criteria
		Question (C4)	Question (C5)	Question (C6)			
1	AAA	72,00	78,00	84,00	234	78,00	H
2	AS	30,00	44,00	50,00	129	43,00	L
3	AF	96,00	100,00	98,00	294	98,00	VH
4	AB	50,00	62,00	74,00	186	62,00	E
5	BLR	68,00	82,00	92,00	242	80,66	H
6	DWF	30,00	60,00	30,00	120	40,00	L
7	DR	65,00	85,00	60,00	210	70,00	H
8	FRA	25,00	30,00	40,00	95	31,66	VL
9	JAP	65,00	70,00	65,00	200	66,66	E
10	LFP	65,00	70,00	65,00	200	66,66	E
11	KR	70,00	90,00	90,00	250	83,33	H
12	OZT	40,00	75,00	40,00	155	51,66	L
13	RDA	35,00	60,00	55,00	150	50,00	L
14	RP	60,00	90,00	65,00	215	71,66	H
15	SHAA	65,00	90,00	65,00	220	73,33	H
16	SM	70,00	75,00	70,00	215	71,66	H
17	SWA	65,00	65,00	65,00	195	65,00	E
18	SDP	80,00	85,00	90,00	255	85,00	VH
19	SW	60,00	80,00	55,00	195	65,00	E
20	SWN	45,00	75,00	60,00	180	60,00	E
Total		1156	1466	1313	3940	1313,28	
Average		57,8	73,3	65,65		65,58	C

Based on the results of the data described above, then it can be seen the ability of students to work on HOTS math questions for class V SD Negeri No 040457 Berastagi based on the average total of the three levels of questions. As for students who are at the ability level working on HOTS mathematics questions in the very low category obtained as many as 1 student, namely students who named FRA. Students who received the low category were 4 students named AS, DWF, OZT, and RDA. Students who received the sufficient category obtained as many as 6 students named AB, JAP, LFP, SWA, SW, and SWN. Students who received the high category obtained 7 students named AAA, BLR, DR, KR, RP, SHAA, and SM. Students who get the very high category are obtained as many as 2 students named AF and SDP.

Based on the average total score of the fourth grade HOTS questions for class V SD Negeri 040454 Berastagi are in the moderate category with an average score of 65.58. So it can be concluded that students are quite capable of working on HOTS math questions based on the third level of the HOTS questions.

D. Conclusion

Based on the discussion of research results and data analysis, it can be concluded that the ability of fifth grade students at SD Negeri 040457 Berastagi in working on HOTS questions in mathematics learning is in a fairly good category with the total average of each level of HOTS questions being 65.58. On the level of analyzing questions, an average of 57.8 is obtained with a fairly good category. On the level of evaluating

questions, an average of 73.3 is obtained in the high category, on the question of the level of creation, an average of 65.58 is obtained in the category of quite good.

Bibliography

- Amalia, D., & Hadi, W. (2020). Analysis of student errors in solving hots problems based on mathematical reasoning abilities. *Transformation: Journal of Mathematics and Mathematics Education*, 4 (1), 219-236. <https://doi.org/10.36526/TR.V4I1.904>
- Arifin, Z. (2017). Development measuring instruments Critical thinking skills of students in the 21st century mathematics learning. *Theorems*, 1 (2), 92-100.
- Awaliyah, S. (2018). Journal of praxis and social dedication Preparation of Hots Questions for PPKN and IPS teachers. *Praxis and Social Dedication*, 1 (1), 46-53
- Dinni, H. N. (2018). Hots (High Order Thinking Skills) and In relation to the ability of mathematical literacy. *Prisma*, 1, 170–176.
- Fanani, A., & Kusmaharti. (2014). Development of Hots Based Learning (Higher Order Thinking Skill) in Elementary School Class V. *Journal of Basic Education*, 1 (9), 1–11.
- Fauzia, D. P., Badarudin, & Supriatna. (2015). Improving the critical thinking skills and scientific attitudes of students through the guided inquiry model. *Muallimuna: Journal of Madrasah Ibtidaiyah*, 3 (2), 116-127.
- Giani, Zulkardi, and C. H. (2015). Cognitive level analysis Class VII Mathematics Text Book Books based on Bloom Taxonomy. *Journal of Mathematics Education*, 1-20
- Helmawati. (2019). Learning and Assessment based on HOTS (Higher Order Thinking Skills). Bandung. Teen Rosdakarya
- Hidayati, D. N., Sulistyani, N., & Pantiwati, Y. (2020). Analysis of Error Settlement of HOTS Mathematics Stories Based on Newman Theory of Class V SD students. *Journal of Teacher Professional Education*, 1 (1), 39–50

- Manik, P., Saraswati, S., Ngurah, G., & Agustika, S. (2020). The ability to think of a high level in solving hots mathematics. *Elementary School Scientific Journal*, 4 (2), 257-269.
- Rohmah, M., & Sutiarto, S. (2018). Analysis problem solving in mathematical using theory Newman. *Eurasia Journal of Mathematics, Science and Technology Education*, 14(2), 671–681.
<https://doi.org/10.12973/ejmste/80630>
- Sani Ridwan A. (2019). *Hots -based learning (Higher Order Thinking Skills)*. Tangerang. Tira Smart
- Sugiyono. (2013). *Quantitative, qualitative and R&D research methods*. Bandung. Alfabeta.