An Analysis of Cognitive Levels on Questions Used for Examination in SMP Negeri 15 Padang

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Abstract
This study was descriptive research which aimed to find out distribution of questions for examination within cognitive domains in SMP Negeri 15 Padang. The data were derived from examination questions. The questions from examination were analyzed and classified based on cognitive levels of Revised Bloom's Taxonomy by Anderson and Krathwohl (2001). The examination questions were collected from grade VII, VIII, and IX. The results of the study show that there are significant imbalances in the distribution of questions within cognitive levels for examination. From all grades, LOTS-based questions dominantly found in examination question. Specifically, Understanding (C2) and Applying (C3) level of questions dominated the distribution of questions in SMP Negeri 15 Padang. Meanwhile, only Analyzing (C4) level of question found in HOTS category. However, the percentages of HOTS-based questions are higher than LOTS-based questions found in examination.

INTRODUCTION

The quality of education can be seen through the teachers' competencies. Teachers have an important role in improving education quality. One of the way in improving the quality of education is by giving questions. It can be reflected from the questions that the teacher gives to the students. Boyd (2015) stated that the questions could facilitate students to improve their skills. As a result, ensuring the quality of the questions involved based on standard criteria is critical. To guarantee that the goals are clearly comprehended, a framework is required to determine the quality of questions used, which then can be classified in the cognitive domain of Revised Bloom's Taxonomy. There are two levels of thinking in the cognitive domain, Higher Order Thinking Skills (HOTS) and Low Order Thinking Skills (LOTS). In case to improve students creativity, HOTS is needed as the standard in learning process.

According to (Widiawati et al ., 2018) Higher-Order Thinking Skills (HOTS) refers to the ability to apply knowledge, skills, and values in reasoning, reflection, problem-solving, decision making, innovating and creating something new. HOTS is important to support the teaching and learning process. It is very helpful for students to face the problem that is uncommon in their daily life (Widiawati et al., 2018). Therefore, familiarizing students with HOTS-based question is really necessary.

In learning process, questions are used to engage students in learning activities, encourage them to think critically, and learn more effectively. By asking question, teacher can measure students' understanding. Meanwhile, examination questions used to test students understanding about the topic that they have learnt. Examination question usually conducted in the middle and the end of semester. Examination is set to inform students' mastery within subjects in numerical data. Under the formal mechanism of examinations, the results can be used as the parameter for stakeholders to see the quality of learning, changing policy, or even improve curriculum in national scale.

In the matter of educational standard, Curriculum plays as a fundamental guidance in succeeding educational goals. Nowadays, the Ministry of Education and Culture in Indonesia has implemented the curriculum 2013 as the reference of teaching for all over the subject.The government requires teachers to assist students in prioritizing their critical thinking through the Educational Quality Insurance Institution (LPMP). This involves assessing, examining, and generating HOT (Higher Order Thinking). Therefore, Teachers are supposed to be able to develop students' high order thinking skills through assessments.

Many researches about High Order Thinking Skills (HOTS) questions in examination have been conducted (Mitana et al., 2018; Pratiwi et al., 2019; Fitriani, 2019). They found out that LOTS-based questions still dominate compared to HOTS-based questions. Meanwhile, HOTS-based question is really necessary to improve students' thinking skills. Therefore, the researcher attempted to conduct a research about the distribution of questions within cognitive levels used for examination in SMP Negeri 15 Padang.

RESEARCH METHOD

This study used descriptive research design to described the existing phenomenon about questions used for examination in SMPN 15 Padang. According to Atmowardoyo (2018) Descriptive research is defined as a research method used to describe the existing phenomena as accurately as possible. The data of this research were derived from final exam question. In conducting this research, researcher used checklist format to identify the distribution of levels of questions used within six categories of Revised Bloom's Taxonomy. The indicators of Revised Bloom's Taxonomy are stated in the following table.

Table 1. Indicators of Cognitive Domain in Taxonomy Bloom Revision

C1 (Remember)	C2 (Understand)	C3 (Apply)	C4 (Analyze)	C5 (Evaluate)	C6 (Create)
Mention	Classify	Choose	Examine	Summarize	Assemble
Imitate	Describe	Demonstrate	Contrast	Criticize	Change
List	Explain	Arrange	Distinguish	Validate	Facilitate
Find	Compare	Illustrate	Separate	Enclose	Create
Repeat	Translate	Interpret	Test	Determine	Design
Pronounce	Paraphrased	Use	Edit	Clarify	Establish
State	Elaborate	Modify	Detail	Assess	Write
Sign	Match	Valuated	Select	Defend	Formulate

(Adapted by: Anderson, L.W & Krathwohl, D.R.:2001)

RESULT AND DISCUSSION

Research Finding

The Distribution of Questions for Examination within Cognitive Domains Proposed by Teachers in SMPN 15 Padang

In this part, the data were obtained from final examination of grade VII, VIII, and IX constructed in SMP Negeri 15 Padang. The data of distribution of cognitive levels on questions used for examination are elaborated below.

Table 2 Findings of Distribution of Questions for Examination within Cognitive Domains Proposed by Teachers in SMPN 15 Padang

NO	Levels of Questions	Revised Bloom's Taxonomy	Grades			Total
			VII	VIII	IX	
1.	LOTS (Lower Order Thinking Skills)	Remembering (C1)	21 (42%)	11 (22%)	7 (14%)	39 (26%)
		Understanding (C2)	6 (12%)	18 (36%)	23 (26%)	47 (31,33%)

		Applying (C3)	20 (40%)	17 (34%)	8 (16%)	45 (30%)
2.	HOTS (Higher Order Thinking Skills)	Analyzing (C4)	3 (6%)	4 (8%)	12 (24%)	19 (12,66%)
		Evaluating (C5)	0	0	0	0
		Creating (C6)	0	0	0	0
Total			50 (33,33%)	50 (33,33)	50 (33,33%)	150 (100%)

Table 2 displays the distribution of levels of questions included in examination question in grade VII, VIII, and IX in SMP Negeri 15 Padang. Based on the table, it is seen that the distribution of cognitive levels on final semester examination varied from C1 until C6. As seen in the table, the distribution of questions proposed in examination were dominated by LOTS-based questions, which account for 87,33% of the total questions. Among the 6 cognitive levels, the question classified as Understanding (C2) was the highest level of question proposed in examination which is 31,33%. Followed by Applying (C3) level of questions with the percentage of 30%. In the third common level of questions found in examination, Remembering (C1) level question also quite dominated with the percentage of 26% from total amount. Meanwhile, the distribution of HOTS-based questions proposed in examination accounted only for just 12,66% in Analyzing (C4) category. In addition, there were no questions found in Evaluating (C5) and Creating (C6) category.

Specifically, the distribution of examination questions in grade VII mostly dominated by Remembering (C1) level of questions with percentage of 42%. Following the previous result, Applying (C3) level of questions was also found dominantly with the percentage of 40%. Meanwhile, Understanding (C2) questions only found with the percentage of 6%. There were no questions found in C5 and C6 level of questions. It implies that the distribution of examination questions in grade VII still dominated by Lower Order Thinking Skills (LOTS) questions.

Similarly, the distribution of examination questions in grade VIII still dominated by LOTS-based questions. It was found that Understanding (C2) level of questions mostly asked in examination with the percentage of 36%. This followed by Applying (C3) level of questions with the percentage of 34%. Meanwhile, there were only 8% of questions found in Analyzing (C4) category. Similar to grade VII, there was no questions asked in C5 and C6. It implies that examination questions in grade VIII also dominated by Low Order Thinking Skills (LOTS) questions.

At last, the distribution of examination questions in grade IX were also

dominated by LOTS-based questions in Understanding (C2) category with the percentage of 26%. Different from grade VII and VIII, the second-highest percentage in level of question proposed in examination was Analyzing (C4) with the percentage of 24%, following with Applying (C3) and Remembering (C1) level of questions with the percentage of 16% and 14%.

In conclusion, the data have revealed the variation in the distribution of questions proposed in examination. There was similarity in the types of questions frequently proposed in all grades. To be precise, the level of questions with the highest percentage in grade VII, VIII, IX were all categorized as Low Order Thinking Skills (LOTS) questions. In addition, High Order Thinking Skills (HOTS) questions were only found in Analyzing (C4) category.

Table 3 Findings of Distribution of Questions for Examination within Cognitive Levels in SMP Negeri 15 Padang

NO.	Grade	LOTS		HOTS		Total
		F	%	F	%	
1.	VII	47	94%	3	6%	50
2.	VIII	46	92%	4	8%	50
3.	IX	38	76%	12	24%	50
Total		131	87,33%	19	12,66%	150

Table 3 displays the percentages of LOTS and HOTS questions in examination in grade VII, VIII, and IX. There were 150 questions constructed by teachers from three grades, 50 questions derived from grade VII, 50 questions derived from grade VIII, and 50 questions derived from grade IX. The questions constructed by teachers in examination were dominated by LOTS-based questions with 87, 33% (131 items) followed by HOTS-based questions in 12,66% (19 items) out of the total 150 questions. In short, LOTS-based questions still dominated the examination in each grade, but there were improvement on the numbers of HOTS-based questions used in examination for each grade.

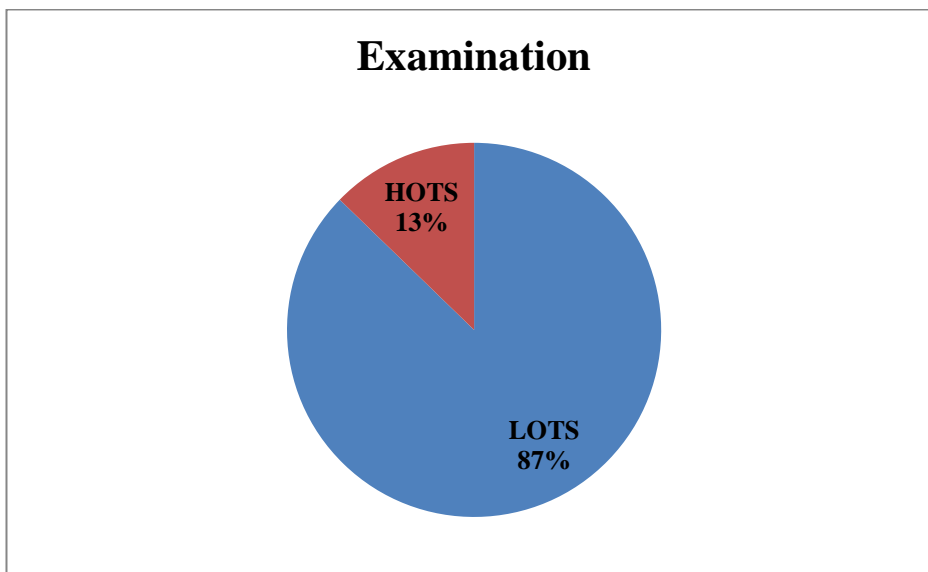**Figure 1. LOTS and HOTS Questions constructed by Teachers for Examination.**

Figure 1 displays the total percentage of LOTS and HOTS questions constructed by teachers in examination within grade VII, VIII, and IX. It is seen that LOTS –based questions still dominated the examination questions with 87% (131 items) of the total 150 questions constructed in each grade while 13% (19 items) of the total amount were in HOTS level.

Discussion

The finding discovered that the distribution of questions used within cognitive levels in examination dominated by Low Order Thinking Skills (LOTS) questions with Understanding (C2) level of questions with the percentage of 31,22% from the total 150 questions. This was followed by Applying (C3) as the second-highest percentage which is 30%. The third-highest level of question was Remembering (C1) category in the percentage of 26% from the total questions. Meanwhile, HOTS-based question only found in Analyzing (C4) category in the percentage of 12,66%. More than half of the questions in examination were asking about information stated in the text. It means that the teachers did not succeed to construct HOTS-based questions for examination. As stated in Lee (2015) it is crucial for teachers to ask Lower Order Thinking Skills questions and Higher Order Thinking Skills questions on balance. Teachers need to be better thinkers and familiar with different levels of questions in order to construct well-crafted question.

Unfortunately, the finding of this research still reveals unsatisfied result. It found that LOTS-based questions mostly involved in examination questions for grade VII, VIII, and IX in SMP Negeri 15 Padang. This finding support the findings of a study from Fitriani (2019) found out that LOTS-based question in the level of thinking of remembering, understanding & applying were dominant compared to HOTS-based questions that limited to level of thinking of analyzing. It implies that it hard for the teachers to construct HOTS-based questions. As a result, teachers should provide more higher-order questions in order to activate students' critical thinking. Wisrance (2020) Also found that LOTS-based questions were dominating

the test that constructed by the teacher. It dominated by C1 and C2 levels of thinking. Therefore, Wisrance (2020) suggested that teachers who are included to the team of test maker need to use Revised Bloom Taxonomy as a basic conceptual framework to make a good quality of questions that can improve students' higher order thinking skills.

CONCLUSION

This research aims to analyze the distribution on questions within cognitive levels used for examination in SMP Negeri 15 Padang. From 150 questions, 131 questions were indicated as LOTS-based questions. Meanwhile, only 19 questions were in HOTS category. The distribution on question within cognitive levels used for examination in SMPN 15 Padang were dominated by LOTS-based questions, which account for 87,33% of the total questions. Among the 6 cognitive levels, the questions classified as Understanding (C2) was the most common level of questions constructed by the teacher in SMP Negeri 15 Padang, which is 31,33%. Applying (C3) levels of questions were in the second position with the percentage of 30%. Remembering (C1) questions were the third-highest levels of questions found in examination, which is 26%. Meanwhile, the questions for High Order Thinking Skills (HOTS) accounted for just 12,66% only in Analyzing (C4) category. Briefly, the data have discovered the variation of the distribution of questions constructed in examination. There was similarity in the types of questions most frequently asked in all grades. To be specific, the level of questions with the highest percentage in grade VII, VIII, and IX were all categorized as LOTS-based questions. Based on research findings, the researcher suggests the future researcher to conduct more comprehensive research about cognitive levels of questions used for examination and the factors that influence the number of cognitive levels in Junior High School.

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