



## Cognitive Level Analysis of English Semester Test for Grade X State Senior High Schools in Bukittinggi

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### Abstract

*This study aimed to explore the cognitive level of questions used by teachers on English semester tests for grade X academic year 2021/2022 at senior high schools in Bukittinggi and the problem faced by English teachers at senior high schools in Bukittinggi in constructing HOTS questions test. This research conducted by using descriptive method. The writer chose five senior high schools in Bukittinggi: SMAN 1 Bukittinggi, SMAN 2 Bukittinggi, SMAN 3 Bukittinggi, SMAN 5 Bukittinggi, and SMAN 5 Bukittinggi. In collecting the data, the writer used the document analysis and interview. From the data analysis, the writer found that English semester test made by teachers at senior high schools contained less HOTS questions where its only cover 12,9% or 23 questions out of 177 total questions. Lack of understanding and students' readiness in receiving HOTS questions become the problem that faced by teachers in designing HOTS questions. According to the findings, the writer suggests teachers be more often involve HOTS questions into semester test. In addition, teachers should be provided with proper training related to HOTS in order to help teacher to be more familiar with designing HOTS questions.*

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## INTRODUCTION

Knowledge and innovation skills, life and job skill, and technology and information skill are the components of achieving the primary goal of 21st-century learning (Gilboy et al., 2015). These skills are related to the teaching and learning process in class. The learning process focuses on student-centered and project-based activities developed through applying high-order thinking skills (HOTS) in the learning process (Şener et al., 2015). High order thinking skill (HOTS) is a level of thinking ability in processing and understanding phenomena through several thinking

processes, which involve processing information, developing understanding, applying knowledge, resolving issues, and conducting research (Hoque, 2016).

As the accordance of HOTS in curriculum 2013, the test conducted in school must be improvised and should be able to test students' critical thinking. The test item should be in higher level in order to train students to think critically (Widana, 2017). Even though the teacher started to involve HOTS in the learning process, HOTS in the test is still not appropriately involved. As findings in research conducted by Widiyaningsih & Septiana (2019) where the national examination in academic year 2016/2017 and 2017/2018 dominated with LOTS. Ramadhana et al (2018) found that midterm test and semester test made by teachers include HOTS up to 25%. However, it is still considered as low involvement of HOTS questions as the proper proportion is about 30%. Syahdanis et al (2021) also found that the distribution of HOTS test items in teacher-made test on grade X and XI in two senior high schools has lower distribution than MOTS and LOTS.

The fact that Indonesian students are weak in critical thinking is according to findings by PISA (Programme for International Students Assessment) in 2018 as the survey showed that Indonesia classified in level 1A which means that Indonesian students are considered to have low reading, math, and science ability (Schleicher, 2019). This phenomenon happened because of teachers tend to measure low-order thinking skills where teachers usually focus on theories, not contextual material related to real-life problems.

Cognitive level defined as the hierarchy of learning ability which arranged from Widiyaningsih & Ilma (2019) the simplest process to the more complex process of acquiring knowledge in order to understanding the new experiences and thought. The processes involved in cognitive level adapted from cognitive process proposed by Bloom (1956) and further explained in Bloom's revised taxonomy by Anderson et al., (2001).

In cognitive domain, students are retrieving and understanding knowledge in the learning process and must process the knowledge into a higher level of thinking, which refers to critical thinking (Bloom, 1956). Anderson et al. (2001) developed and revised Bloom's taxonomy into dual-dimension taxonomy consisting of knowledge and cognitive process types that include remember, understand, apply, analyze, evaluate, and create, which is well known as the cognitive level (C1-C6). Furthermore, in creating questions, there should be three cognitive levels: 1) Low category, which involve recall (C1) and comprehension (C2), 2) Medium category which involve application (C3), and 3) High category which involve analysis (C4), evaluation (C5) and create (C6).

In designing HOTS questions, teachers also faced several problems. As found in research conducted by Syahdanis et al. (2021) that the less appearance of HOTS questions in test is because of the teachers' lack understanding about designing HOTS questions due to the lack of professional training, and teachers' worries that students are not able to solve the question in higher level. Similar with (Abkary & Purnawarman, 2020), there are two major challenges faced by teachers: teachers' understanding about HOTS, and students' aspect where they have different perspective in understanding HOTS questions.

Even though several studies conducted to find out the cognitive level used by teachers in teacher-made test and the problem that faced by teachers in designing HOTS questions, the writer cannot find any research that conducted at senior high schools in Bukittinggi. Therefore, the writer conducts the research in title “Cognitive Level Analysis of English Semester Test for Grade X State Senior High Schools in Bukittinggi”.

## **RESEARCH METHOD**

### ***Research Design***

This study categorized as descriptive research. Descriptive method is used as this study goals to describe the phenomenon and its characteristics. This study also classifies as document analysis where the writer does the research that applied to written or visual materials for the purpose of identifying specified characteristics of the material.

### ***Population and Sample***

The population of this research is all English semester test made by English at senior high schools in Bukittinggi. There are 5 state senior high schools in Bukittinggi, they are: SMA Negeri 1 Bukittinggi, SMA Negeri 2 Bukittinggi, SMA Negeri 3 Bukittinggi, SMA Negeri 4 Bukittinggi, and SMA Negeri 5 Bukittinggi. While the sample is taken by using purposive sampling where the writer chooses state senior high schools in Bukittinggi due to the writer’s pre-observation and only on the English compulsory semester test conducted for grade X at senior high schools in Bukittinggi.

### ***Instruments***

This research conducted by using document analysis to analyze the instruction or the skill required in the questions and the action verbs or keywords in the questions, and then match them to the aspects in revised Bloom’s taxonomy. Meanwhile, interview is conducted to obtain in-depth information about the problem faced by teachers when confront when designing HOTS questions in semester test.

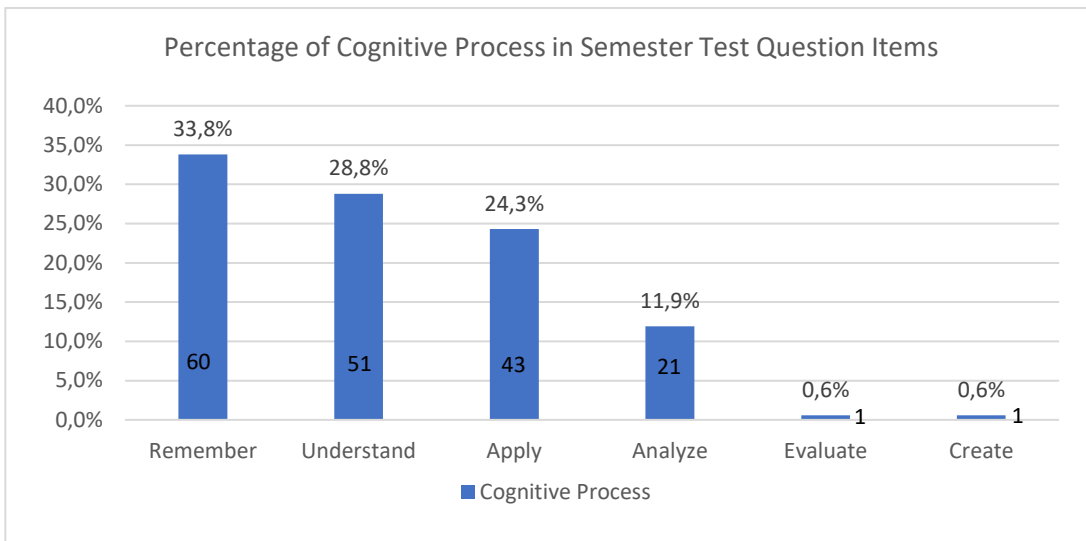
## **RESULT AND DISCUSSION**

### ***Findings***

*Cognitive Level of Question Used by Teachers in English Semester Test for Grade X Academic Year 2021/2022 at Senior High Schools in Bukittinggi*

The writer identified the aspects, the skill demonstrated and the keywords in each question. Once the aspects, the skill demonstrated and the keywords found, the writer determined the cognitive level of the questions according to the indicator of cognitive level. The following is the total of percentage of six cognitive process in all semester test question items:

Table 1 Percentage of Cognitive Process in Semester Test Question Items



According to the data analysis, the writer found that teachers designed question items involved vary cognitive processes. Amongst the 177 question items, there are 60 questions or 33,8% for cognitive process remember (C1), 51 questions or 28,8% for cognitive process understand (C2), 43 questions or 24,3% for cognitive process apply (C3), 21 questions or 11,9% for cognitive process analyze, 1 question or 0,6% for cognitive process evaluate (C5) and 1 question for or 0,6% for cognitive process create (C6).The following table shows the detail of the distribution of cognitive level in each semester test bundle:

Table 2 The Distribution of Cognitive Level in Each Semester Test

School	L1		L2	L3			Total
	C1	C2	C3	C4	C5	C6	
SMAN 1 BKT	12 (30%)	12 (30%)	5 (12,5%)	10 (25%)	1 (2,5%)	0 (0%)	40 (100%)
SMAN 2 BKT	18 (42,9%)	8 (19,1%)	7 (16,6%)	9 (21,4%)	0 (0%)	0 (0%)	42 (100%)
SMAN 3 BKT	7 (28%)	10 (40%)	6 (24%)	1 (4%)	0 (0%)	1 (4%)	25 (100%)
SMAN 4 BKT	13 (32,5%)	9 (22,5%)	17 (42,5%)	1 (2,5%)	0 (0%)	0 (0%)	40 (100%)
SMAN 5 BKT	10 (33,3%)	12 (40%)	8 (26,7%)	0 (0%)	0 (0%)	0 (0%)	30 (100%)
TOTAL	60 (33,8%)	51 (28,8%)	43 (24,3%)	21 (11,9%)	1 (0,6%)	1 (0,6%)	177 (100%)

Therefore, the distribution of the cognitive level in semester tests made by English teachers at five state senior high schools in Bukittinggi is conclude as follows:

Table 3 The Distribution of Cognitive Level in Semester Test

Cognitive Level	Cognitive Process	Question Item Found	Total
Knowledge and Comprehension (L1)	C1	60(33,9%)	111(62,7%)
	C2	51(28,8%)	
Application (L2)	C3	43(24,3%)	43(24,3%)
Analysis (L3)	C4	21(11,9%)	23(12,9%)
	C5	1(0,6%)	
	C6	1(0,6%)	

Based on the table above, cognitive level knowledge and comprehension (L1) covers 62,7% or 111 out of 177 question items made by English teachers at senior high schools in Bukittinggi which indicate that L1 is the most likely to be found in semester tests. Followed with L1, there are 43 out of 177 questions or 24,3% for cognitive level application (L2). Meanwhile, the least found is the cognitive level analysis (L3) which only 23 questions or 12,9% amongst the 177 question items collected.

#### *Problem Faced by English Teachers at Senior High Schools in Bukittinggi in Constructing HOTS Questions*

According to the analysis, the writer found that problems faced by English teacher as follows: 1) Teachers are lack of understanding on HOTS questions, 2) Students are not ready to be given HOTS questions. The writer found that teachers are unfamiliar of knowledge about HOTS question due to the lack of training related to HOTS. Even though provided with several trainings, teachers feel that the trainings could not help them understand HOTS question. The lack of training had impact to teachers' knowledge towards HOTS where teachers do not have proper knowledge about the HOTS, including the knowledge about thinking skill, cognitive process and cognitive level in the question they designed.

In addition, teachers stated that the reason of less occurrence of HOTS questions is because teachers worry that students might not able to solve HOTS questions as students are not trained enough. Even though HOTS might help students in their critical thinking, teachers think that students are not ready to be given higher level of questions

#### **Discussions**

##### *Cognitive Level of Question Used by Teachers in English Semester Test for Garde X Academic Year 2021/2022 at Senior High Schools in Bukittinggi*

Based on the findings from the analysis of cognitive level of questions used by teachers in English semester test at senior high schools in Bukittinggi, it can be seen that the proportion of HOTS questions in English semester test at senior high schools in Bukittinggi has low percentage of HOTS questions. As mentioned by Ramadhana et al. (2018), the proper proportion of HOTS questions in test at is 30%. However, the writer found only 12,9% of HOTS questions in semester test which is still far below the proper proportion that should be involved in test. From the 177 questions collected from five senior high schools in Bukittinggi, there are 23 questions that

belong to HOTS level which consist of 21 questions for C4, 1 question for C5 and 1 question for C6.

The finding of this research in line with the research conducted by Arif (2019) where there are only 20% questions that contained high order thinking skill found in final examination made by teacher for grade X while there is not any HOTS question in final examination for grade XI. Similar findings also found in research conducted by Syahdanis et al (2021) where the semester test made by teachers dominated with MOTS questions and contain small portion of HOTS questions. Both researches has similar findings that in semester test made by teachers, HOTS questions has less occurrence rather than MOTS and LOTS questions.

#### *Problem Faced by English Teachers at Senior High Schools in Bukittinggi in Constructing HOTS Questions*

The interview conducted shows the result that teachers faced several problems in designing HOTS questions, those are the lack of understanding in HOTS questions and the consideration of students' readiness in receiving HOTS questions. Based on the findings explained above, the teachers feel that they are lack of knowledge and understanding toward HOTS questions where they cannot completely understand with HOTS assessments. Teachers also feel that the lack of knowledge is because they are not provided with proper training related to HOTS. Another reason of less occurrence of HOTS questions is because teachers are more likely to consider students readiness in receiving HOTS questions. Teachers are worried that students might not be able to solve the higher level of questions due to the students' lack of training in solving HOTS questions which may impact to ineffectiveness of HOTS in enhancing students' critical thinking.

The similar result is also found in research conducted by Syahdanis et al. (2021) where the main reason of less appearance of HOTS questions in semester test at two senior high schools in Bengkulu is because of the lack of professional training for teachers and because of teacher worry that students are not able to solve the higher level of questions. In line with that, Abkary & Purnawarman (2020) also found the similar result there teachers faced the lack of knowledge about designing HOTS assessments and the difficulties in students aspect as the reason of students have vary perspective on understanding material and ability in thinking.

#### **CONCLUSION**

In analysis of cognitive levels of questions used by teachers on English semester test, the writer conclude that cognitive level of questions used by teachers in English semester test for grade X academic year 2021/2022 at state senior high schools in Bukittinggi contained less HOTS questions where its only cover 12,9% or 23 question out of 177 total questions collected. Meanwhile in finding the problem faced by English teachers at senior high schools in Bukittinggi on constructing HOTS questions, the writer concluded there are two major problems that faced by English teachers at state senior high schools in Bukittinggi on constructing HOTS questions, those are: teachers' unfamiliar of knowledge related to HOTS question and students' readiness in receiving HOTS questions.

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