



**HIGH ORDER THINKING SKILLS-BASED QUESTIONS IN THE TEST ITEMS  
DEVELOPED BY SENIOR HIGH SCHOOL ENGLISH TEACHERS  
OF PADANG**

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**Abstract**

This research was a descriptive research that aimed to identify the tests developed by senior high school English teachers in Padang using High Order Thinking Skills criteria. This study also aimed to determine the mostly-used criteria of HOTS in the tests. The sample in this study were mid semester tests and semester tests developed by English teachers from MGMP Bahasa Inggris SMA kota Padang. The tests used in this study were from grade XI of 2016/2017. Each test had two packages (A and B). This study used instrument in the form of indicators from HOTS criteria and Bloom's HOTS criteria.

From the result of the tests developed by senior high school English teachers of Padang using the criteria of Higher Order Thinking Skills, it showed that the tests developed had used the HOTS criteria. As a result of the analysis of the two tests, 33% of High Order Thinking Skills questions were found in Mid Semester tests, and there are about 17% of High Order Thinking Skills questions found in Semester tests. The result of this research also found that the mostly-used HOTS criteria in the tests are *Creating* and *Deduction*. The Knowledge dimensions found in the tests are Conceptual Knowledge, Procedural Knowledge, and Metacognitive Knowledge.

**Key words:** Test Item, High Order Thinking Skills, Bloom's Taxonomy

Examination nowadays is given to test students' comprehension of what they have learned should be designed well in order to improve their ability to comprehend the knowledge. Generally, today's learning is about what students should know, what they have to do, what they are going to be and how they can

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live together after that, so knowledge comprehension is needed by them. Besides, comprehension of the lesson is more than what students can find in the written form. To achieve this, evaluative processes are carried out upon the test item to find out the point of students critical thinking. One of the evaluation process is presented by test item. The test items given nowadays do not include critical thinking enough. It should be applied to the item of questions include in students examination. Curriculum and educational processes are also responsible for building learners' abilities and thinking habits. To build them, the test items should consist of critical thinking point to urge learners to think; otherwise, they will become low achievers who focus on lower thinking skills (LOTS). This is a need to success the evaluation of lessons comprehension to confirm their effectiveness as a means of developing cognitive skills specifically higher order thinking skills (HOTS).

As stated by Halili (2015), according to him HOTS is a capability that is needed by every individual in the educational environment. HOTS is a thinking ability that arises from a combination of several other complex thinking skills. In accordance with the opinion of Godson (2011) in Higher Order Thinking Skills which states HOTS is the ability to think that involves solving problems, detecting relationships, combining new information with information that is known creatively according to the limits set, and combining and using all previous knowledge in evaluate or make judgments. HOTS deals with the ability to think critically, logically, reflective, metacognitive, and creative. This ability is activated when students face unusual problems, uncertain questions or questions that cause doubt.

Anderson and Krathwohl's (2001) revised Taxonomy of Bloom have two dimensions perspective for higher order thinking and classification of its operational verbs can be described as follows:

Table 1

The Knowledge Dimension	The Cognitive Process Dimension		
	C4 analyze	C5 evaluate	C6 create
Factual Knowledge	Making structure, classifying	comparing, correlating	Joining
Conceptual Knowledge	explain, analyze	examine, interpret	planning
Procedural Knowledge	distinguish	conclude, resume	arrange, formulate
Metacognitive Knowledge	create, find	make, assess	realization

According to Insight Assessment (2011), the newest versions of the California Critical Thinking Skill Test include the following scale scores identifying areas of strengths and relative weakness in cognitive skills associated with High Order Thinking Skills.

a. Analysis

Analytical reasoning skills enable people to identify assumptions, reasons, and claims, and to examine how they interact in the formation of arguments. We use analysis to gather information from charts, graphs, diagrams, spoken language, and documents. People with strong analytical skills attend to patterns and to details. They identify the elements of a situation and determine how those elements interact. Strong interpretation skills can support high-quality analysis by providing insights into the significance of what a person is saying or what something means.

b. Evaluation

Evaluative reasoning skills enable us to assess the credibility of sources of information and the claims they make. We use these skills to determine the strength or weakness of arguments. Applying evaluation skills, we can judge the quality of analyses, interpretations, explanations, inferences, options, opinions, beliefs, ideas, proposals, and decisions. Strong explanation skills can support high-quality evaluation by providing the evidence, reasons, methods, criteria, or assumptions behind the claims made and the conclusions reached.

c. Inference

Inference skills enable us to draw conclusions from reasons and evidence. We use inference when we offer thoughtful suggestions and hypotheses. Inference skills indicate the necessary or the very probable consequences of a given set of facts and conditions. Conclusions, hypotheses, recommendations, or decisions that are based on faulty analyses, misinformation, bad data, or biased evaluations can turn out to be mistaken, even if they have been reached using excellent inference skills.

d. Deduction

This is the decision making in precisely defined contexts where rules, operating conditions, core beliefs, values, policies, principles, procedures, and terminology completely determine the outcome depends on strong deductive reasoning skills. Deductive reasoning moves with exacting precision from the assumed truth of a set of beliefs to a conclusion that cannot be false if those beliefs are true. Deductive validity is rigorously logical and clear-cut. Deductive validity leaves no room for uncertainty, unless one alters the meanings of words or the grammar of the language.

e. Induction

The decision making in contexts of uncertainty relies on inductive reasoning. We use inductive reasoning skills when we draw inferences about what we think is probably true based on analogies, case studies, prior experience, statistical analyses, simulations, hypotheticals, and patterns recognized in familiar objects, events, experiences, and behaviors. As long as there is the possibility, however remote, that a highly probable conclusion might be mistaken even though the evidence at hand is unchanged, the reasoning is inductive. Although it does not yield certainty, inductive reasoning can provide a confident basis for solid belief in our conclusions and a reasonable basis for action.

HOTS questions or test items are highly recommended in various forms of classroom assessment. To inspire teachers to prepare HOTS questions at the educational level, here are the descriptions of the characteristics of HOTS questions:

#### 1. Measuring high-order thinking skills

The Australian Council for Educational Research (ACER) states that high-order thinking is a process: analyzing, reflecting, arguing, applying concepts to different situations, composing, creating. High-order thinking is not the ability to remember, know, or repeat. Thus, the answers to the HOTS questions are not explicitly stated in the stimulus. High-order thinking skills include problem solving skills, critical thinking, creative thinking, reasoning, and making decision. Higher-order thinking is one of an important competency in the modern era, so it must be owned by every learner.

Widana (2017) says that 'difficulty' is not the same as higher order thinking. The level of difficulty in the item is not the same as the high-order thinking ability. For example, to know the meaning of an uncommon word may have a high level of difficulty, but the ability to answer the problem does not include higher order thinking skills. Thus, HOTS questions are not necessarily those that have high level of difficulty.

According to Balitbang Kemdikbud (2017), a question that measures high-level thinking processes presented various information, usually in the stimulus. Stimulus can be text, images, graphics, tables, etc. which contains information from real life. Stimulus used should be interesting, that is to encourage students to read.

High-order thinking skills can be trained in the classroom learning process. Therefore, to have high-order thinking skills, the learning process also provides space to learners to discover the concept of activity-based knowledge. Activity in learning can encourage learners to build creativity and critical thinking.

#### 2. Contextual-based problems

Widana (2017) says that HOTS questions are real-life situational assessments, where learners are expected to apply classroom learning concepts to solve problems. The contextual problems that our community faced today are related to the environment, health, earth and space, and the use of science and technology in various aspects of life. Those are include how students learn to relate, interpret, apply and integrate science in learning solve to problems in a real context.

As high order thinking skills are operating the cognitive skills which are needed in thinking processes happen in short-term memory, students are expecting relate every clues to the fact. Due to this, first things that teachers need to give to the students are: 1). Identify the questions or conclusion that will be made, 2). Identify the known facts, 3). Identify the relevant knowledge, and 4). Create the final prediction. It can be assumed that student centre process will be achieved as they common with these.

However, in Indonesia, the application of HOTS to the learning progress still has some weaknesses. First, teacher-centre is still dominant in learning process. Teacher as the conveyor of knowledge sometimes eliminate the students center practice. Second, the educational focus is memorizing. Third, the classic problem, more student achievement scoring systems are based on tests that are tested for low-level cognitive trends. Fourth, teachers are still lack of HOTS-based question knowledge. So that, high order questions (rich questions) need to be applied in students' test items. Of course, those are including the ability to conclude, hypothesize, analyze, apply, synthesize, evaluate, compare, imagine, and answer the questions. These skills need high logic thinking.

In relation to this, there are some researches that have been conducted by some researchers who take the same topic about HOTS. The previous study discusses about the analysis of test items by classifying the question items into their corresponding Bloom's cognitive level. For example, a research by Nazlia, Syahidah, Rosilah, Haslina, Masura, Noor, and Rozli (2011) about an automated analysis of the exam questions to determine the appropriate category based on this taxonomy. Another research is conducted by Uulia Iffa (2017) which aims to determine the national exam HOTS science physics and HOTS students of SMP N 1 Salo in completing the national exam science physics.

Based on the problems above, this research aims to evaluate High Order Thinking Skills questions in *test items developed by senior high school's English teachers in Padang*. To achieve that, the researcher has built a check list based on Bloom's taxonomy and HOTS criteria as a criterion for the evaluation process

## RESEARCH METHOD

This research was a descriptive research that aimed to identify the teachers' test item based on high order thinking skills. The objects of the research were the test items developed by English teachers from deliberations of subject teachers or MGMP Bahasa Inggris SMA Kota Padang. In this research, the data used were the grade XI midterm tests of 2016 and semester tests of 2017. Each test had 2 packages (A and B). The sources of data were coming from the teachers who took

responsibility in designing midterm and semester tests based on MGMP instruction. the researcher used indicators as criteria. The indicators guided the researcher in evaluating the questions. Each tests were evaluated by the researcher by following the criteria that proposed by Bloom's Taxonomy and HOTS for formulating the principles of questions based on criteria or indicators. The criteria used are *Analyzing*, *Evaluating*, *Creating*, *Inference*, *Deduction*, and *Induction*. The researcher counted all the evidence containing in the questions after filled in the criteria in the evaluation format. For example, answering the criterion '*Analysis*', the researcher counted all contracted forms containing in the questions and then found the percentage of it. The formula of the percentage is:

$$P = \frac{n}{N} \times 100\%$$

P = the percentage

n = number of question based on the criterion found in the questions

N = the total number of questions

After the percentage of HOTS questions were found, the researcher described each criterion along with examples of questions that meet those criteria. For example, describing the questions of *Analyzing* criteria, the questions explained one by one along with the discussion based on the theory. The researcher also classified the HOTS questions into dimensions of knowledge by reviewing the knowledge dimensions based on Bloom's theory then analyzed each HOTS question based on the dimension. For example, describing the dimension of Conceptual Knowledge, the questions were classified based on the dimension into one part. The whole analysis was discussed based on the theory of HOTS and some previous study related to this research.

## RESULT AND DISCUSSION

### 1. Research Finding

Based on the table above, it can be seen that the categories of High Order Thinking Skills are found in the test. There are 3 categories of HOTS questions in the tests; *Analyzing*, *Evaluating*, *Creating*. Here are the description of each question:

#### A. The extent of HOTS questions developed by senior high school English teachers in the tests

##### a. The analysis of Midterm and Semester Tests

Table 1  
HOTS questions in Midterm Tests

No.	Criteria	Number of Questions		Total	%
		Set A (30 questions)	Set B (30 questions)		
1	Analysis	9, 12	9	3	5%
2	Evaluating	-	-	-	0%
3	Creating	27,28,29,30	27,28,29,30	8	13%
4	Inference	10	5	2	3%
5	Deduction	7,8,11	7,8,10,11,12	8	13%
6	Induction	26	26	2	3%
Total of HOTS questions				23	37%

Table 3  
HOTS questions in Tests

No.	Criteria	Number of Questions		Total	%
		Set A (40 questions)	Set B (40 questions)		
1	Analysis	24	18	2	3%
2	Evaluating	-	-	0	0%
3	Creating	-	-	0	0%
4	Inference	4,20,40	4,29	5	6%
5	Deduction	33,34	19,31	4	5%

6	Induction	15,37	15,37	4	6%
Total of HOTS questions				15	20%

Based on the table above, it can be seen that the criteria of High Order Thinking Skills are found in the test. There were 5 items of the criteria included in the test; *Evaluating, Creating, Inference, Deduction, and Induction.*

1) *Analyzing*

*Arrange the sentences below to form a correct dialogue!*

*(1): why don't we go to the market near here. It's easier and more comfortable.*

*(2): Let me take you to the market.*

*(3): Alright then. Let's go*

*(4): Will you cook for our lunch today?*

*(5): Sure, but I haven't bought the materials yet.*

*(6): That's right but I like going to the market better than to the mall because it's cheaper and most of the materials are fresh.*

*The correct arrangement of the sentences is ...*

- A. 4-3-2-1-5-6
- B. 4-5-6-3-1-2
- C. 4-1-2-5-6-3
- D. 4-5-2-6-1-3
- E. 4-5-2-1-6-3

This question is classified into *analyzing* category. The question requires the students to arrange the sentences into a correct dialogue. In this question, the students must have organizing competency which identify each sentences based on its context, and then they recognize the way of relation between the sentences so that those sentences can be arranged into a coherent conversation. In this case, the most coherent conversation arranged is option E that is 4-5-2-1-6-3

2) *Creating*



*Please give your suggestions at least three to overcome the problem on the picture above! (question number 27 MID Set A and B*

This question is categorized as *Creating* because it includes the ability to bring up the plan or the suggestions for cases or problems. Students are expected to draw suggestions based on the problem given. The ability to plan and implement the plan belong to *Creating*. Therefore, this questions are classified as *Creating* question. After student draws the opinion about the child, students have to decide the problem solving to overcome the case based on the picture. The suggestions may vary because students have their own way to solve the problem.

3) *Inference*

*“Libraries are our link to the past and our gift to the future.” What do you think the writer means? (question number 10 MID SET A)*

- A. *Libraries can help us to find what we need.*
- B. *We could find everything in the library.*
- C. *Students can read everything in the libraries.*
- D. *Libraries are the windows for us to have any information about the past and the future.*
- E. *Libraries protect and preserve the knowledge.*

This question is categorized as *Inference* question because it belongs to the ability to draw conclusion from the information given. This question asks students to interpret the meaning of writer’s sentence, *Libraries are our link to the past and our gift to the future*. The options help students to decide the true answer by providing the different sentence form. Students are expected to draw similar conclusion based on the statement given. The ability to make conclusion belongs to *Inference*. Therefore, this question is classified *Inference* question. Option D is the best answer because it has the closest meaning with the sentence. The words *link* and *window* show that they perform the same function as medium to connect two different things.

4) *Deduction*

In the other hand, *Deduction* requires a precisely defined context and the conclusion cannot be false and the validity is rigorously logical and clear-cut such as alters the meaning of word or the grammar of the language. There are 6 questions related to this criteria. Here is the following example of question in the tests:

*(7).You shouldn't sneeze without ... your mouth.*

- A. *rising*
- B. *rubbing*
- C. *opening*
- D. *showing*
- E. *taking*

This is the decision making in precisely defined contexts and the answer can't be false. The question requires the appropriate vocabulary based on the context. The best answer of this question is *opening* because you shouldn't sneeze with closed mouth.

5) *Induction*

*Induction* requires students to draw inferences about what they think is true based on analogies or cases. As long as there is the possibility, however remote, that a highly probable conclusion might be mistaken even though the evidence at hand is unchanged, the reasoning is inductive. There are only 2 inductive questions included in the Semester tests:

(15). *What can we learn from the character of Bill Gates?*

- A. *He is courageous to fight with other founders*
- B. *He is very determined of what he does.*
- C. *He is easy to give up in studying.*
- D. *He is a spoiled son in his family.*
- E. *He is a selfish man but smart.*

(37). *What can we learn from the song?*

These questions are categorized as *Induction* because these questions require to make decision or to draw inferences about what we think probably true based on analogies or cases. These questions ask students to draw their point of view about what they get from the text. The first question asks students to conclude about what they can learn from the Bill Gates. Second question tells a song about friendship, so students are expected to get something around friendship after reading this song lyrics.

**a. The dimension of knowledge of HOTS criteria in the tests**

There are four kinds of knowledge dimension. They are *Factual Knowledge*, *Conceptual Knowledge*, *Procedural Knowledge*, and *Metacognitive Knowledge*. Based on the findings of this research, not all dimensions found in the tests. Since there are four dimension included, here are the dimension of knowledge found in the tests:

Based on the table above, not all dimensions used in the tests. There are 15 *Conceptual Knowledge* questions, 3 *Procedural Knowledge* questions, and 12 *Metacognitive Knowledge* questions. It can be concluded that

teachers have conducted the tests based on knowledge dimension in order to gain students high order thinking skills.

## DISCUSSION

The findings that have been obtained from the analysis of test items developed by English senior high school teachers of Padang using High Order Thinking Skills Categories show that there are 25% HOTS questions found in the tests. Based on the proportion of HOTS question, (30%), the HOTS questions found in these tests are almost reach the proportion but still under the criteria of good proportion. From 120 questions, there were 30 questions belong to HOTS-based question. It could be seen in both tests, Midterm tests had 36% (Set A) and 39% (Set B) HOTS questions included in the test, and there were 20% (Set A) and 17% (Set B) HOTS questions found in Semester tests.

Based on the knowledge dimension, the HOTS questions in these tests belong to *Factual Knowledge*, *Conceptual Knowledge*, and *Metacognitive Knowledge*. From 120 questions, it was found there were 10% questions of *Factual Knowledge*, 12% *Conceptual Knowledge*, and 10% *Metacognitive Knowledge*.

## CONCLUSION AND SUGGESTIONS

This research focused on the analysis of test items developed by English senior high school teachers of Padang using HOTS criteria. The purposes are to find out the questions in the tests which belong to high order thinking criteria. The data were coming from the midterm and semester tests developed by senior high school English teachers from MGMP of Padang. They construct midterm and semester tests for senior high schools students' grade X, XI, and XII. There are 41 state and private senior high schools with 173 English teachers included in MGMP of Kota Padang. In this research, the data used are the grade XI midterm tests of 2016 and semester tests of 2017. Each test has 2 packages (A and B). The sources of data are coming from the teachers who took responsibility in designing midterm and semester tests based on MGMP instruction. The tests developed are modified questions taking from question bank, students' books and also internet. The teachers develop the test based on the English question's grid.

Based on four sets of tests analyzed, Midterm tests have 33% HOTS questions included in the test, and there are around 17% HOTS questions found in Semester tests. Moreover, there are mostly used criteria found in the tests because not all criteria used there. In these tests which developed by senior high school English teachers which belong to MGMP of Padang, they mostly used the *Creating* and *Deduction* criteria. Since the criteria of HOTS have already used in these tests, it can be said that the tests have the sense of measuring HOTS.

The role of high order thinking skills in students test items are very important in order to increase students' critical thinking. In other words, the questions are not only measuring students' knowledge and focus in memorizing, but also their ability to analyze, evaluate and create new ideas so they can increase their logic thinking.

Regardless of the findings of this thesis, there are some suggestions offered by the researcher to the following parties: First, the senior high school English teachers. The teachers should improve the variety of HOTS questions in students' tests in order to include all criteria so the tests can assess the whole criteria of HOTS. The questions can be more various by reviewing the HOTS criteria and deciding the questions based on each criteria. Second, the next researcher. It is expected that the result if this research could be used by the next researcher as a reference to conduct a similar research about high order thinking skills.

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