

CHAPTER II

THEORRETICAL REVIEW

This chapter highlights review of theoretical framework which ideally discusses the Indonesia's National Examination, High Order Thinking Skill (HOTS), Bloom's Taxonomy in Cognitive Domain, and Krathwohl's Model as Revision to Bloom's Taxonomy.

A. Indonesia's National Examination

National Exam (UN) According to Permendikbud Number 5 year 2015 article 1 paragraph 5, Activity measurement and assessment of achievement of graduates nationally in certain subjects. The use of the results of national exam UN according to Permendikbud Number 5 year 2015 article 21 paragraph 1 is as follows: (1) Mapping the quality of the program and. Or unit of education; (2) Considerations of selection at the next level of education; and (3) consideration in coaching and providing assistance to the unit of education in its efforts to improve the quality of education.

Based on the Kemendikbud (2015:10-13) Quality questions are good questions, honest and credible implementation, the utilization of results for improvement of quality of sustainable education, precise quality, timely, accurate, and precise. National examination, is conducted to form the integrity of the learner generation. National examination, is a (diagist) mapping of the needs of students, parents, teachers, schools, governments and communities. Map of the

road change from the 2015 national review to later in 2019-2020. In 2015, the national exam was not for graduation, so it could be repeated the following year, skhun more significant, and the introduction of CBT. While the year 2016-2018, the national review was carried out at the beginning of the last semester and the national examination can be repeated the same year. In the year 2019-2020 to come, schools and teachers can better guide the potential of students, the national exam of the CBT is conducted in depth and established test center in the region, national exams are conducted with a flexible schedule.

B. High Order Thinking Skill (HOTS)

Education is not only a process of transferring science. Teacher at this time is not a spokesperson but as a facilitator. HOTS (Higher Order Thinking Skill) implemented in the 2013 curriculum in accordance with international standards, namely the Organization for Economic Cooperation and Development (OECD), TIMMS, and PISA which are defined as the ability to apply knowledge, skills, and values in making reasoning and reflection in solving a problem, making decisions, and being able to create something innovative. HOTS will keep students close to the real world context they will someday face.

1. Definition of HOTS

According to Lewis and Smith (in Putra 2019:179) HOTS is a high-level thinking capability that occurs if a person has information stored in memory and obtains new information, then connects, compiles and develops that information to achieve the goal or obtain a possible solution to the confusing situation. Lewis and Smith also suggested that HOTS cover 3 things, which are critical thinking,

creative thinking, solving problems, and making decisions. Subsequently Anderson and Krathwohl (in Yeung 2015:555) argue that HOTS (Higher Order Thinking Skills) are high-level thinking skills. HOTS measure students in; 1) Transfer of concepts, 2) process and implement information, 3) associate a variety of different information, 4) Resolve issues using information, and 5) study ideas and information critically.

Based on Heong, dkk (in Hanita 2017:101) high-level thinking abilities are a broader use of mind to discover new challenges. Furthermore Widodo (2013:41) said that high-level thinking is thinking at a higher level than merely memorizing facts. High-level thinking skills relate to student learning outcomes that are closely related to the ability to process the information they have learned. Therefore, HOTS are important to have learners to process information, make decisions, and resolve problems so that students become human beings who can compete in future lives.

According to The Cambridge English Teaching Knowledge Test, The University of Cambridge (in Nugroho 2018:39) stated that HOTS were cognitive skills such as the analysis and evaluation that the teacher taught his students the usual. These skills include thinking about something and making decisions about things, solving problems, thinking creatively, and thinking about the positives and negatives of something. From the explanation above, it can be concluded that HOTS is a high level of thinking capability that cover 3 aspects, namely, the ability of critical thinking, creative thinking ability, and problem solving skills that are implemented by the cognitive level of taxonomy of Bloom C4, C5, and

C6. Critical thinking is the ability to analyse, create, and use objectively with criteria, and evaluate data. Creative thinking is the ability to use a detailed structure that generates new and original ideas. The ability to solve problems is the ability to think complex and in-depth to solve problems.

2. Characteristics of HOTS

Widana (in Helmawati 2019:32) describes the characteristics of the HOTS problem including three components, namely: (1) Measuring the students' high-level thinking skills; (2) contextual-based issues; and (3) use various forms of matter. A question is said to be able to measure the ability of high level thinking if the problem can encourage students to do problem solving, critical thinking, creative thinking, arguing and being able to make the right decision. HOTS have distinctive characteristics, this level of capability includes students' abilities or skills in analyzing, evaluating, and creating. The skill indicators of analyzing, evaluating, and creating are based on the theories described in Bloom's taxonomy revision. According to The Australian Council for Educational Research (ACER) states that high-level thinking abilities are a process: analyzing, rearranging, giving arguments (reasons), applying concepts to different situations, composing, creating. High-level thinking skills are not the ability to remember, know, or repeat. Thus, the answer to the HOTS problem is not explicitly stated in the stimulus. High-level thinking skills include the ability to solving problems, critical thinking skills, creative thinking, reasoning, and decision making. High level of thinking is one of the most important

competencies in the modern world, so it is obligatory for every student (Widana, 2017:4).

Bloom's Taxonomy (Cognitive Domain)

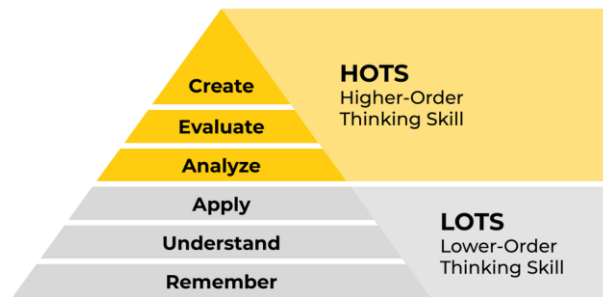


Figure 1.Changes in levels of Bloom’s taxonomy cognitive domain

Based on Bambang Subali and Pujiati Suyata (2012:2) about HOTS should have characters involving high levels of thinking, complex problems, and involving various cognitive levels. The structure of a test item with a HOTS character consists of a case study, a choice question, and a request for election reason. From some of the experts ' opinions on the characteristics of HOTS, the following researchers concluded the characteristics of HOTS there are 11: 1) Measuring High level ability, 2) measure the cognitive aspects of analyzing, 3) evaluating, and creating, 4) transfer one concept to another concept, 5) processing and implementing information, 6) Search for links from a variety of information, 7) using information to resolve issues, 8) study ideas and information critically, 9) Discovering, analyzing, and creating new methods, 10) Reflection, 11) Predicting, 12) Take the right decision.

3. The Purpose of HOTS

The purpose of HOTS is not as a process that only leads to the completion of the highest level of achievement as it climbed a ladder. HOTS gives students the opportunity to get acquainted and eventually become accustomed to the various levels of thought from the lowest to the highest HOTS. Students not only climb the stairs from the bottom up and finish, but the students always go up and down repeatedly so that they get used to and understand each stair's details. As a matter of HOTS, the more accustomed to a child exploring various cognitive levels will be easier to complete and face the problem.

C. Bloom's Taxonomy in Cognitive Domain

High Order Thinking Skills is a process of thinking learners in a higher cognitive level developed from various cognitive concepts and methods and taxonomic learning such as problem solving method, bloom taxonomy, and taxonomy of learning, teaching, and assessment (Bertaria, 2015:112). Bloom divides the cognitive domain into six levels of thinking, i.e., (1) knowledge or know-how to recall the information that has been studied, (2) comprehension or understand the meaning of the material, (3) application, use the knowledge in new situations and situations that have not been experienced before or apply the rules or principles, (4) analysis, identify and understand the material parts or the whole material, (5) synthesis, combining elements to form a new whole , and (6) evaluation, examine or assess carefully based on several criteria.

D. Krathwohl's Model as Revision to Bloom's Taxonomy

The taxonomy bloom revision by Anderson and Krathwohl focuses more on how more vibrant and applicative cognitive domains for educators and learning practices are expected to help educators in the process and formulate efficient learning and scoring strategies. The above three concepts that become the basis of high order thinking skills refer to the activity of analyzing, evaluating, creating conceptual-tailored, procedural and metakognitive knowledge. According to Krathwohl (2002) in *A revision of Bloom's Taxonomy*, the indicator for measuring the ability of high-level thinking includes analyzing (C4) which is the ability to separate the concept into several components and connect each other to gain an understanding of the concept as a whole, evaluate (C5) that the ability determines the degree of something based on the norm, specific criteria or benchmark, and creates (C6) i.e. the ability to blend elements into a whole new form and breadth, or create something original. These High order thinking skills include the ability of problem solving, creative thinking skills, critical thinking, argument ability, and decision-making ability. According to King, high order thinking skills include in it critical thinking, logical, reflective, metacognitive, and creative, while according to Newman and Wehlage (Widodo, 2013:162) with high order thinking learners will be able to distinguish ideas or ideas clearly, arguing well, being able to solve problems, being able to construct explanations, able to hypothesize and understand complex things become more obvious. According to Vui (Kurniati, 2014:62) High order thinking skills will occur when a person associates a new information with a record that has been stored in his memory and

is associating and/or rearranging and developing that information to achieve a purpose or to find a solution of a predicament. The basic keywords that mostly appear within questions, based on the Revised Bloom's Taxonomy were illustrated in Table 1.

Table 1. Revised Bloom's Taxonomy Action Verbs

Definition	I.Remember	II.Understand	III.Apply	IV.Analyzing	V.Evaluate	VI.Create
Bloom's Definition	Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers.	Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas.	Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.	Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations.	Present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria.	Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions.
Verbs	Choose Define Find How Label List Match Name Omit Recall Relate Select Show Spell Tell What When Where Which Who Why	Classify Compare Contrast Demonstrate Explain Extend Illustrate Infer Interpret Outline Relate Rephrase Show Summarize Translate	Apply Build Choose Construct Develop Experiment with Identify Interview Make use of Modal Organize Plan Select Solve Utilize	Analyze Assume Categorize Classify Compare Conclusion Contrast Discover Dissect Distinguish Divide Examine Function Inference Inspect List Motive Relationships Simplify Survey Take part in Test for Theme	Agree Appraise Assess Award Choose Compare Conclude Criteria Criticize Decide Deduct Defend Determine Disprove Estimate Evaluate Explain Importance Influence Interpret Judge Justify Mark Measure Opinion	Adapt Build Change Choose Combine Compile Compose Construct Create Delete Design Develop Discuss Elaborate Estimate Formulate Happen Imagine Improve Invent Make up Maximize Minimize

Bloom's taxonomy divides the way people learn in three areas. One is a cognitive area that focuses on intellectual outcomes. This domain is divided into categories or levels. Keywords used and the types of questions asked can help with the formation and encouragement of critical thinking, especially at higher levels.

1. Remembering

Remembering is merely about how the students mention about the facts, definition, or concept based on the text given. Because it can be found out in the text if they read it carefully. Naturally on this level, the students are only to recognizing, finding, than removing the fact, concept or definitions from the text to the answer sheet. Exhibits previously learned material by recalling facts, terms, basic concepts and answers. **Key words:** who, what, why, when, omit, where, which, choose, find, how, define, label, show, spell, list, match, name, relate, tell, recall, select. (Dwiastuty & Nurjanah, 2016)

2. Understanding

Understanding means that the students are able to understand what they read, what is the content of the text they read. And they are able to find the relationship of each information from the text, finding causality, finding similarities and dissimilarities, and so forth. The question given on this level is not too difficult, it is still about a simple cognitive aspects, even though it is higher than remembering. Here, the students are not only to recognize the text and to match the question with its answer but they are able to understand it. Their ability in understanding and paraphrasing correctly, proofing their good understanding

about the text they read. - demonstrating understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions and stating main ideas. **Key words:** compare, contrast, demonstrate, interpret, explain, extend, illustrate, infer, outline, relate, rephrase, translate, summarize, show, classify. (Dwiastuty & Nurjanah, 2016)

3. Applying

Applying means that the students are able to apply their understanding on the situation and condition which are relating each other. The students ordered to give the new cases, new examples, about a concept, a definition, or facts. Their ability in giving the examples, demonstrating their understanding, presenting what they know, and so forth, are a fact that they are not only remember and understand, but also they can apply it. Solving problems by applying acquired knowledge, facts, techniques and rules in a different way. **Key words:** apply, build, choose, construct, develop, interview, make use of, organize, experiment with, plan, select, solve, utilize, model, identify. (Dwiastuty & Nurjanah, 2016)

4. Analyzing

Analyzing demands the students to be able to analyze the information in a text, recognizing, identifying, and distinguishing the information. The cognitive activity demanding on this level is more than only to understand the content. The understanding level demanding in here is a critical understanding, and detail information, more above those, it is about the specific part, specific information of the text. The ability on the level of analyzing can be the question of topic, main idea, supporting idea, the main sentences, the supporting sentences, and kinds of

paragraph, purpose of the text, concluding sentences, concluding the text, conjunction, and so forth. Examining and breaking information into parts by identifying motives or causes; making inferences and finding evidence to support generalizations. **Key words:** analyze, categorize, classify, compare, contrast, discover, dissect, divide, examine, inspect, simplify, survey, take part in, test for, distinguish, list, distinction, theme, relationships, function, motive, inference, assumption, conclusion. (Dwiastuty & Nurjanah, 2016)

5. Evaluating

This level demands the students to be able to give evaluation upon the text they read, whether about the content or about the cases and problems, or about how the writer write the text / point of view. Evaluation on the content can be the evaluation of ideas, concepts, how to solve the problems, more above them, the students may give the better in solving the problems. Evaluation on the point of view can be the evaluation of the effectiveness in conveying the problems. Everything about language, for example language style, clearances, preciosity, etc.

Test on this level needs not only deeper knowledge about the problems on the text, but also the knowledge out of the text. Same as the synthesis test, this evaluation test also needs the high level of cognitive activity. This test is very good used in order to measure the student's way of thinking, and to train them well. Therefore, an essay test is better than multiple choices, because essay test can be used to measure the student's ways of thinking, prediction, and creativity, better than objective test. Presenting and defending opinions by making

judgments about information, validity of ideas or quality of work based on a set of criteria. **Key Words:** award, choose, conclude, criticize, decide, defend, determine, dispute, evaluate, judge, justify, measure, compare, mark, rate, recommend, rule on, select, agree, interpret, explain, appraise, prioritize, opinion, support, importance, criteria, prove, disprove, assess, influence, perceive, value, estimate, influence, deduct. (Dwiastuty & Nurjanah, 2016)

6. Creating

The level of creating, demands the students to be able to create new ideas and information using what has been learned before. The students have to be able to correlate or to generalize the concepts, cases, ideas, facts and opinions which are in the text, compile information together in a different way by combining elements in a new pattern or proposing alternative solution. Cognitive activity on this level is activity to get the new information, to predict, and to solve the problem. Cognitive activity on this level is a complex and high level activity. The test given also demands the not simple cognitive activity any more, that is why, and not every single person is able to do this test perfectly.

The result of this test shows the student's way of thinking. It is different with the cognitive test before, in this synthesis test may occur several different answers from the different students which the quality may equally the same. A text read by the students often full of information, or problems need to be thought over and coped by the readers. So an essay test is better than multiple choices. An essay test gives them chance to show up their creative thinking, their way of thinking and predict their creativity to relate a case with the others, to correlate between the

concepts and facts, to generalize, and so forth. The students have to be really understood about the problem faced in the text. The teachers have to train them well not only to think over the problems critically but also to get the logical solving problems. Compiling information together in a different way by combining elements in a new pattern or proposing alternative solutions. **Key Words:** build, choose, combine, compile, compose, construct, create, design, develop, estimate, formulate, imagine, invent, make up, originate, plan, predict, propose, solve, solution, suppose, discuss, modify, change, original, improve, adapt, minimize, maximize, delete, theorize, elaborate, test, improve, happen, change. (Dwiastuty & Nurjanah, 2016)

E. Previous Studies

There were some similar researches which had relationship with this research. The first study is from (Anggraini, 2019) that aimed to describe the results of test HOTS of students in 3 school categories based on Bloom's revised taxonomy theory. The similarity between Anggraini's research and this research is on the theory that we used. The difference between Anggraini's research and this research is the aim. The aim of Anggraini's research is to analyze the results of test HOTS of students based on Bloom's cognitive level and to know the dominant level applied test item while this research is to know what are the features of hots question in english examination test. Second is study from Ayaturrochim entitled The Analysis of Reading Tasks in "English in Focus" Based on Cognitive Domain of Revised Bloom Taxonomy. The objective of this study was to find out the dominant component of cognitive domain of Revised

Bloom's Taxonomy in reading task of "English in Focus" textbook for Junior High School published by The National Education Department in 2008 and the result showed that there were 30 (98%) reading task used remember level of the cognitive domain and only 1 (2%) reading task used understand level. The other levels of cognitive domain were not used in reading tasks of "English in Focus" textbook. The similarity between Ayaturrochim's research and this research is on the theory that we used. The difference of Ayaturrochim's research and this research are the object and the aim. The object of Ayaturrochim's research is reading task in English book while this research is English National Examination. In addition, the aim of Ayaturrochim's research is to find out what is the dominant level in reading test items while this research is to know what what are the features of hots question in english national examination.