ANALYSIS AVAILABILITY OF HOTS INDICATORS ON SENIOR HIGH SCHOOLS PHYSICS EXAM QUESTION IN AGAM DISTRICT

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STATEMENT

I hereby declare that:

1. My scientific work, the final projrct in the form of a thesis eith the title "Analysis Availability Of Hots Indicators On Senior High Schools Physics Exam Question In Agam District" is my original work
2. This paper is purely my ideas, formulations, and research without any help from other parties except the supervisor.
3. In this paper, there is no work or opinion that have been written or published by other people, except in writing it is clearly stated as a reference in the manuscript by mentioning the author and being included in the literature.
4. I have made this statement in truth and if there are deviations in this statement, I am willing to accept academic sanctions in the form of revocation of the degree that has been obtained because of this paper, as well as other sanctions in accordance with applicable legal norms and provisions.

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ABSTRACT

Hersha Hanifa, 2021. "Analysis Availability Of Hots Indicators On Senior High Schools Physics Exam Question In Agam District"

Efforts to improve the quality of education in Indonesia continue to be carried out by the Government. One of the ongoing agenda is curriculum development. The 2013 curriculum requires students to have thinking skills, one of which is Higher Order Thinking Skills (HOTS). To achieve this, teachers must practice using strategies to train students to think higher order. It is time to implement HOTS questions in learning. HOTS-based questions can make students skilled in the ability to solve problems, skilled in decision making. The results of the observations show that the questions used in Senior High School throughout Agam Regency are still in the low category and do not meet the good proportion of questions. Therefore, research on the analysis of the HOTS indicator was carried out on physics questions at Senior High School Agam in Agam. This research is descriptive research with a qualitative approach. The population of this research is about Senior High School's Physics Exam in Agam Regency for the 2019/2020 academic year. The research data was taken using an analytical instrument of question presentation and data collection techniques through documentation. Based on the research that has been done, it is found that the percentage of HOTS indicators for each question is 39.15% for class X semester 1, 38.5% for class X semester 2, 36.3% for class XI semester 1, 18.25% for class XI semester 2 and 24.5% for class XII semester 1 and for HOTS indicators that are often found in Physics Exam questions are the Problem Solving and Critical Thinking indicators, followed by decision making indicators while the least encountered is the Creative Thinking indicator.

Keywords : Analysis, Exam Questions, HOTS Indicators

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Padang, November 5, 2021

Author

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CHAPTER I
INTRODUCTION

A. Background of Research Problem

Efforts to improve the quality of education in Indonesia are continuously being carried out by the Government. One of the ongoing agenda is curriculum development. (Ariyana, 2019:6) According to law no. 20 of 2003 concerning the education system that "National education aims to develop the potential of students to become human beings who believe and are devoted to God Almighty, have noble character, are healthy, knowledgeable, capable, creative, independent and become democratic and responsible citizens in the context of enrich the life of a nation.

One of the potentials of students that needs to be improved is intelligence as implied in the law. One of the ways to improve the intelligence of students is by developing students' thinking skills in solving problems. Thinking skills are very important in describing and explaining phenomena. According to Bloom's taxonomy, which has been revised, thinking skills are divided into two levels, namely *Lower Order Thinking Skills* (LOTS) and *Higher Order Thinking Skills* (HOTS). Higher order thinking skills are one approach in learning where students are taught to think critically, logically, reflectively, metacognitively, and creatively.

Through physics learning, it is expected that students can develop themselves in thinking. Students are required not only to have lower *order thinking skills*, but also to have higher *order thinking skills* (Istiyono, Edi, 2013). Achievement in physics which demands high-order thinking skills of Indonesian

high school students in the international arena is still low. Schools should start cultivating *Higher Order Thinking Skills* to meet the demands of the 21st century. This is in accordance with the characteristics of *skills* society of the 21st century according to the *partnership of 21st century skills* which indicates that students in the 21st century must be able to develop competitive skills required in the 21st century focused on the development of HOTS (Basuki, et al, 2014) .

The 2013 curriculum which is currently being implemented by the government also requires students to think at a higher level. This is indicated by the presence of several operational verbs that indicate the students' higher-order thinking skills in the core competencies (KI) of the 2013 curriculum. To determine a person's higher-order thinking ability, an assessment is needed. According to Permendikbud No. 23 of 2016 (Permendikbud, 2016: 5-6), assessment of learning outcomes by educators is carried out in the form of tests, observations, assignments and or other necessary forms. To carry out the assessment, teachers need an assessment instrument in the form of questions, both to test aspects of knowledge, attitudes, and skills. The assessment instrument used by the teacher to test student learning outcomes in the knowledge aspect is usually taken from various books or a collection of exam questions. Questions can be in the form of descriptions, multiple choice, short entries and others.

It is time to implement HOTS questions in learning. HOTS-based questions can make students skilled in the ability to solve problems, skilled in decision making. HOTS ability can help students to argue appropriately and effectively in making rational decisions or solutions. HOTS abilities can also

make students more active, work together, and think broadly. The ability of *Higher Order Thinking Skills* (HOTS) is an asset for students in facing a more advanced life in the future.

The reality in the field, the questions usually tend to test more aspects of memory to analyze. Even though there are many books that present material by inviting students to learn actively, the presentation of concepts is very systematic, but often ends with evaluation questions that do not train students' higher-order thinking skills. The evaluation questions to train students to be skilled can be done by the teacher by training questions that invite students to think at the level of analysis, evaluation and creation.

The Program for International Student Assessment (PISA) is a program initiated by countries that are members of the OECD (Organization for Economic Cooperation and Development) (Pratiwi, 2019). The results of the assessment are issued by PISA every three years. If the results are good and the country is able to be at the top level in the achievement index, it is considered a country that has educational standards that are in accordance with the needs of the international market. Subjects assessed by PISA consist of literacy in the fields of reading, mathematics, and science. On December 3, 2019 PISA released its assessment results. PISA's ranking in the results of the study fell compared to the results of pisa in 2015. In terms of reading ability, Indonesia is in the 6th lowest rank of 74 of the 79 PISA participating countries. In mathematics, Indonesia is in the 7th lowest rank or 73rd. In science, Indonesia is in the 9th lowest or 71st. Based on these results, it can be concluded that Indonesian children over 15 years of

literacy, reading, and science skills are still low. These results become homework for the government to advance education.

The difficulty level of the 2018 UNBK questions at the high school level in Indonesia has been raised and has implemented *Higher Order Thinking Skills* (HOTS). The Minister of Education and Culture stated that this was done to increase student competitiveness considering that in several international Olympic results such as those held by PISA, Indonesia was still lagging behind other countries due to difficulties in working on Olympic questions. The Minister of Education and Culture is trying to evaluate and continue to make improvements. The purpose of increasing the difficulty level of the UNBK questions is basically good because by working on the HOTS questions it is hoped that students' analytical power and higher-order thinking skills can be trained. This is also part of the implementation of the curriculum where students never give up and are serious in learning and working on questions with the HOTS indicator.

The first fact is viewed from the use of lesson plans. The learning model used in the SMAN RPP in Agam Regency is *Discovery Learning, Learning Cycle, Problem Based Learning* and Guided Inquiry so that the average is in accordance with the demands of the 2013 curriculum. The learning model that is in accordance with the demands of the 2013 curriculum is an integrated thematic learning model. To strengthen this,-based learning is applied to disclosure/research(*discovery*/ *inquiry learning*). To encourage the ability of students to produce contextual work, both individually and in groups using a

learning approach that produces project *based learning*. The learning model applied is adjusted to KD, for learning indicators the average HOTS level is available but only at the C4 level. Researchers also conducted interviews with several teachers where the application of lesson plans in the learning process was not optimal because students were less active in the learning process and had not been able to learn independently, especially in problem solving.

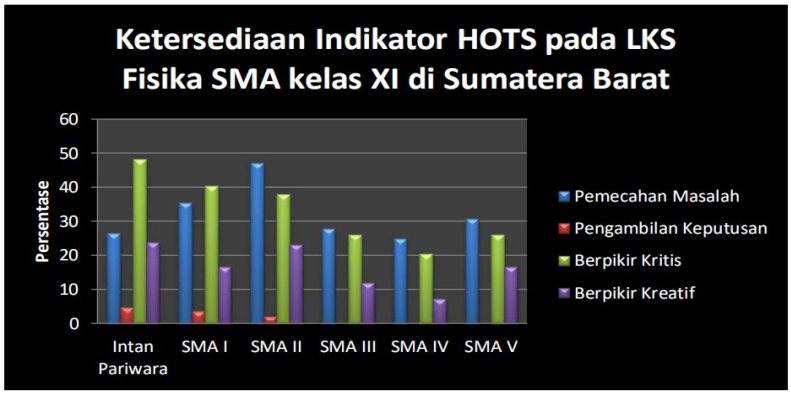

Figure 1 Availability of HOTS indicators in LKS
(Syafrinaldi, 2020)

The second fact relates to the availability of HOTS components in Physics LKS for Class XI SMA in West Sumatra. Based on Figure 1, it can be seen that the availability of HOTS components in LKS, namely Intan Pariwara 25.77%; SMA I 28.80%; SMA II 27.52%; SMA III 24.60%, SMA IV 19.69% and SMA V 24.75%. It can be concluded that the LKS used already contains HOTS components in the low category.

The third fact from the results of the documentation study that the researchers did by collecting the 2018 Physics UN scores in West Sumatra Province, it is known that the 2018 Physics UN scores in Agam Regency are still below the averagePhysics UN scores. Provincial Sumatra Westis 43.94 while the average score of the Physics National Examination of West Sumatra Province is

44.02 so that the researchers set Agam Regency as the place of research. Then the researchers analyzed the UN scores of students in Agam Regency through data from the Assessment and Learning Center and then analyzed the results of the exam, it was found that the level of understanding of concepts and learning outcomes of Physics students was still not optimal. The ability of students in answering HOTS questions is also not maximized. This can be seen based on the results of the analysis of the national exams throughout Agam Regency where the researchers took samples of several different schools in Agam Regency, the researchers took this school sample according to the high school category to the low school category based on the 2018 National Examination results.

Table 1. Students' ability to complete about the UN Physics 2018 based on the level of cognitive (HOTS, MOTS and LOTS)

Type of Problems	Number Of Problems	Problems Percentage	PERCENTAGE		
			SMoNA	SMoNC	SMoNC
HOTS	6 Questions	15%	37.5%	36%	25%
MOTS	27 Questions	67.5%	45%	38%	36%
LOTS	7 Questions	17.5%	49%	42%	41%

(Source: Puspenjar Kemendikbud)

In addition to analyzing the results of student answers in answering the UN questions related to the HOTS questions above , interviews were also conducted with several high school physics teachers in Agam Regency and obtained some facts about students' HOTS abilities. Some Physics teachers said that the students' ability to solve problems that were already good was only a small percentage of students from the total population of students in the class. Students who can solve problems are only certain people who understand the concepts of physics and are skilled in mathematical calculations. There are still

many students who do not understand the concepts of physics and mathematics, so students find it difficult to solve the problems given by the teacher.

Based on the facts obtained from observations and interviews, it turns out that students' HOTS abilities are still in the low category. This is caused by several factors, namely, the lack of understanding of students in answering HOTS questions, the lack of use of HOTS questions in the questions used during the learning process to the availability of HOTS questions themselves. The questions used should be able to achieve the objectives of the 2013 Curriculum. Therefore, the questions must contain the HOTS indicator. From the data obtained, it is known the percentage of the HOTS indicator on the UN questions, but it is still not identified whether during the learning process in class the questions used by the teacher such as the Physics Exam questions have met the criteria for HOTS questions or not. In addition, no research has been found related to analyzing Physics questions that have the availability of HOTS indicators.

Therefore, the researcher intends to analyze physics questions related to the availability of HOTS indicators as input for schools to prepare students for the National Examination that has implemented HOTS indicators, so it is hoped that students' ability to solve HOTS questions will increase. Thus the researchers will conduct further research, namely analyzing the availability of HOTS indicators on Physics questions with the title " **Analysis Availability Of Hots Indicators On Senior High Schools Physics Exam Question At In Agam District** ". This study also aims to analyze the questions given whether they are in accordance with the characteristics of HOTS or not as input for teachers and schools to prepare

students for UNBK who have used HOTS questions, so it is hoped that students' ability to solve HOTS questions will increase

B. Identification of the Research Problem

In the background As described, there are several problems that occur. In order to make the focus of the problem in this research clear, the researchers identified several problems including the following:

1) Lack of planting indicators about *Higher Order Thinking Skills* (HOTS) to meet the demands of the 21st century
2) The results of research *Program for International Student Assessment* the 2019(PISA) released by OECD(Organization for Economic Cooperation and Development) said that Indonesia was ranked 74th out of 79 countries
3) Based on the analysis about the National Exam of Physics 2018 Senior High Schools in Agam District found that the availability of about HOTS still low
4) Based on the analysis about the National Exam of Physics 2018 Senior High Schools In Agam Regency, it is known that the ability of students to answer HOTS questions is still low. The
5) physics questions used are not yet known for the availability of HOTS indicators.
6) No research has been found that analyzes the availability of HOTS indicators on physics questions.

C. Limitation and Scope of the Problem

Based on the results of problem identification, so that The research is more focused, based on the title that has been proposed, the following restrictions are held:

1) Indicators of *Higher Order Thinking Skills* (HOTS) questions to meet the demands of the 21st century and 2013 curriculum are analyzed based on 4 HOTS
2) indicators Indicators of *Higher Order Thinking Skills* (HOTS) questions) analyzed based on 4 HOTS indicators Revised Bloom's Taxonomy The
3) questions to be analyzed are the UAS Senior High Schools Se - Agam District in the 2019/2020 school year.

D. Formulation of Research

Based on the research problems that have been proposed, it can be formulated as follows:

"How is the availability of HOTS indicators in about the Physics UAS of Senior High Schools in Agam Regency?"

E. Research Objectives

Based on the formulation of the problem proposed, the purpose of this study is: to find out how the availability of the HOTS indicator on the physics exam at Senior High Schools Se - Agam Regency

F. Research Benefits

Results of this study are expected to be useful for researchers, teachers and students. The benefits of this research are as follows:

1. For the researcher is beneficial to improve the insight, knowledge and experience as a prospective educator on indicators for *Higher Order Thinking Skills* (HOTS)
2. For the teacher is useful as a material consideration in the manufacture of the questions that will be used for the assessment of learning outcomes learners
3. for students useful to train, develop and to measure the ability of thinking high-level they are
4. helpful for other researchers as a reference to conduct research in the future.