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Hots-Based Analysis on English Reading Comprehension Formative Assessment

Aulia Putri Ardiana*; Agus Husein As Sabiq

IAIN Purwokerto, Indonesia

aulia.ardiana@gmail.com

Abstrak

The Ministry of Education and Culture has directed the assessment model at Higher-order Thinking Skills (HOTS), but in reality, students are less trained in solving the model of this assessment. This cause the learning outcomes of students tend to be less by the teachers. Therefore, the assessments made by teachers should be on the basis of HOTS. This study aimed to find out the assessment level of reading comprehension formative assessment administered by the English teachers in reference to HOTS. This research is classified as quantitative descriptive research involving two English teachers in SMA 2 Brebes. The items of formative assessment are analyzed using the cognitive level of the revised Bloom. As the results, the researchers find that the questions categorized as HOTS level obtain 18 out of 91 questions or (19.78%). Meanwhile, 73 out of 91 questions or (80.22%) are categorized as LOTS level. It can be implied that HOTS based questions are not at the dominant level. However, the test meets the requirements of minimum standard by the Ministry of Education and Culture in the National Exam (UN) that is between 15%-20%. But, it is still a little bit less to the position of PISA questions which requires 20%.

Keywords: HOTS, LOTS, Formative Assessment, Reading Comprehension.

A. Introduction

Assessment belongs to classroom activities and it is an essential process that requires promoting learning and measuring achievement. Assessment is the process of gathering and processing information to measure the achievement of student's learning outcomes. Assessment is defined as a systematic process for collecting student achievement data (Dhindsa, Omar, & Waldrup, 2007), review, information to improve learning and development (Abbasnasab Sardareh & Mohd Saad, 2013; Gardiner, 2002). In educational context, it is an essential component of teaching and learning process. Based on Black & Wiliam (1998), they defined assessment is all activities that have been carried out by teachers and students in assessing themselves, which then provides information to be used as feedback to be able to modify learning activities where they are involved in it.

There are two kinds of assessment, summative and formative assessment. Formative assessment is an assessment for learning that teachers administer to collect the measurement of students' progress in their learning and enable them to get feedback from teachers (Abbasnasab Sardareh & Mohd Saad, 2013; Amua-Sekyi, 2016). Meanwhile, summative assessment is a comprehensive measurement to determine the students' levels, grades, and qualification (Abbasnasab Sardareh & Mohd Saad, 2013; Amua-Sekyi, 2016; Loyd & Koenig, 2008; Smith, 2013). It usually takes place as completion at the end of a course or program to evaluate the students' having met the goals and the objectives of the program. It is usually fully funded by the education institution, schools, or Ministry of Education.

In Indonesian context, as the result of the 2013 curriculum implementation, the assessment system is also changed. Based on the report of the Indonesian Ministry of Education and Culture, Indonesian students' have lack of ability in understanding the complex information and theories, analyzing the problems, using tools and procedures to solve the

problems, and conducting an investigation (Kemendikbud, 2017). Thus, the Government integrates HOTS questions in National Examination (UN) in range between 10% - 15% in 2019.

Since the 2018 high School National Examination, HOTS-typed questions began to introduce. Higher-Order Thinking Skills is a concept based on Bloom's Taxonomy which consists of: knowledge (C1), understanding (C2), application (C3), analysis (C4), synthesis (C5), and evaluation (C6). This taxonomy is regarded as a conceptual framework that divides educational objectives into several groups. There are several levels of thinking skills after being revised, ranging from low level of thinking skills i.e. knowing (C1), understanding (C2), applying (C3) to high level of thinking skills which consist of analysing (C4), evaluating (C5), and creating (C6) (Anderson & Krathwohl, 2001). Meanwhile, Schraw & Robinson (2011) classified higher-order thinking skills from Bloom into 2 parts, lower order thinking skills (LOTS) consisting of knowledge, understanding, and applying and higher-order thinking skills (HOTS) consisting of analysis, synthetic, and evaluation.

HOTS is defined in terms of critical thinking, logical thinking, creative thinking (Crawford & Brown, 2002), reflective and metacognitive thinking (King, Goodson, & Rohani, 1998). In defining HOTS, (Brookhart, 2010) included transfer as one of HOTS aspects that the students can apply their knowledge and skills to different situation outside the classroom. Through HOTS, students become independent thinkers, arguments what students say can be an indication of the quality of students' abilities. Using HOTS as one of the learning approaches produces productive learning activities, especially in socio-cognitive interactions. HOTS is in the higher level of the hierarchy of cognitive process which needs higher creative and and complexive thinking to solve the problems (Mahendra, Parmithi, Hermawan, Juwana, & Gunartha, 2020; Yee et al., 2015).

(Hedgcock & Ferris, 2018) stated that reading activity is one of the complex interactions of cognitive processes and strategies to get various

types of information contained in the text. Reading is the most important skill in the educational context as it can be the assessments for students' general language ability (Fairbairn & Brown, 2005).

There are five-component namely, phonemic awareness, phonics, fluency, vocabulary, comprehension. Comprehension is making sense of what someone reads and connecting the ideas in the text to what he already knows (Mikulecky & Jeffries, 1998). Comprehension needs an effective use of strategic processes, such as metacognition and comprehension monitoring (Moore, 2014). Van Den Broek & Espin (2012) defined reading comprehension as a complex interaction among automatic and strategic cognitive processes that enable the reader to create a mental representation of the text. It can be said that reading comprehension is a process of relating the readers' background knowledge with the information in the text to get the message of the text.

HOTS-based assessments began to be applied in various subjects to improve the quality of education in Indonesia. The use of HOTS-based assessments also extends beyond the National Examination. Along with this, the application of HOTS-based questions began to be applied to the questions in the Midterm Exam and the Final Semester Exam. The assessment in Indonesia is directed at the assessment model of Higher-order Thinking Skills even though the assessment does not have a quantitative basis in which the assessment can be stated as an assessment based on higher-order thinking skills (Kemendikbud, 2017). Based on the background above, the researchers carry out the research that is to investigate the level assessment administered by the teacher based on HOTS in Reading Comprehension formative assessment to help the student to face the Final Semester Examination.

B. Method

Based on the variables of the research, it included as quantitative descriptive research. According to Sugiyono, (2017), he claims that descriptive research is a method that serves to describe or give an overview of the object under study through data or samples that have been collected as they are without analyzing and making general conclusions. The data collecting that carried out by the researcher was conducted by asking the teacher the reading comprehension daily test assessment based on higher-order thinking skills that had been held in the class 3 times. The researcher also used a simple statistical calculation to determine the distribution of each level of Bloom's taxonomy that is the higher-order thing skill level. The researcher also used exploratory data analysis to explore data by knowing the data distribution patterns, summarizing data, describing data in a variety of plots, graphs, charts, and tables.

This research was conducted in Senior High School 2 Brebes with 11th grade science and social English teacher. The object of the research is the reading comprehension in the assessment of learning particularly in the higher-order thinking skill based daily test that held approximately one semester three times. The material that researcher get was analytical exposition and report text. It can be seen in the appendixes page 94 until 99. The subject of the research is the 11th-grade social and science English teachers, Mr. Haldoko and Mrs. Hida. Mr. Haldoko who teach English in 11th grade of science and Mrs. Hida teach English in 11th grade of social.

In this research, the researchers used documentation and a checklist table for collecting the data. The researchers took samples of formative assessments as the ingredients to collect data. After getting the samples, the researchers made a checklist table each of the assessment items whether the items were included in the Higher Order Thinking Skills indicators or still in the Low Order Thinking Skills type. The researchers used the revised Bloom's taxonomy by Schraw & Robinson (2011) as the guidance to judge

each numbers of the assessment items. The indicators of the lower order thinking level and higher order thinking level can be seen in the table above:

Table 1. Revised Bloom's Taxonomy (Schraw & Robinson, 2011)

CATEGORY	KEYWORDS	
Remembering: <i>can the student recall or remember the information?</i>	Mention the definition, imitate the pronunciation, state the structure, pronounce, repeat, state	LOTS- Lower Order Thinking Skill
Understanding: <i>can the student explain the concept, principle, law or procedure?</i>	Classify, describe, explain the identification, placed, report, explain, translate, paraphrase	
Applying: <i>can students apply their understanding in a new situation?</i>	Choosing, demonstrating, acting, using, illustrating, interpreting, arranging the schedule, making the sketch, solving the problem, writing	
Analyzing: <i>can students classify the sections based on their difference and similarity?</i>	Examining, comparing, contrasting, distinguish, doing discrimination, separating, test, doing the experiment, asking	HOTS- Higher Order Thinking Skill
Evaluating: <i>can students state either good or bad towards a phenomenon or certain object?</i>	Giving argumentation, defending, stating, choosing, giving support, giving the assessment, doing an evaluation	
Creating: <i>can students create a thing or opinion?</i>	Assemble, change, build, create, design, establish, formulate, write	

The researchers analyzed data using inductive analysis. The steps were identification, clasification, exploratory data analysis, and drawing conclusion. The results of the data were calculated using percentage to fulfill the indicators that have been set.

C. Findings and Discussion

Based on the data obtained by researchers, there were 4 daily tests categorized as formative assessments. The daily tests were held three times in the 11th-grade social on August 7th, September 24th, and October 30th, 2019. Furthermore, the 11th-grade science class only gets a once-daily test that had been held on October 27th, 2019. The model of the daily tests that had been held by 11th-grade social was multiple-choice; meanwhile, the model of daily tests that had been held in the 11th-grade science was essay reading questions. Each question has a different number of numbers, the 11th-grade social gets two times of daily test about analytical exposition and there were 55 items of questions meanwhile the report material for 11th-grade social there were 30 items of question.

Furthermore, the 11th-grade science class only gets 6 items of questions about analytical exposition material. The 11th-grade science didn't get the daily test about report material as 11th-grade social. Those questions were analyzed by a checklist table to find out the distribution of the cognitive domain in every question of reading comprehension.

There are six cognitive skills in the revised Bloom's taxonomy. Those six skills are divided into lower-order thinking skills that contain remember, understanding and applying meanwhile, for the other one is higher-order thinking skills that consist of analyzing, evaluate and create. By knowing the distribution of the cognitive domain, the researcher divided every question and categorizes the questions which are included in the lots or HOTS category. The following table is the checklist table that consists of the column for the list of the reading questions in every daily test and the cognitive domain from the revised edition of Bloom's taxonomy.

Table 2. The Cognitive Domain of Multiple Choices Reading Comprehension in the 1st Formative Assessment

Cognitive Level	Total Questions	Percentage	Level of Thinking Skills
Remembering (C1)	15	50 %	LOTS = 73.3%
Understanding (C2)	1	3.3 %	
Applying (C3)	6	20 %	HOTS = 26.7 %
Analyzing (C4)	6	20 %	
Evaluating (C5)	0	0 %	
Creating (C6)	2	6.7 %	
Total	30	100 %	

Based on the tables above, the distribution of the higher-order thinking level which consists of analyzing, evaluate and create skill only get 8 questions out of 30 questions. Meanwhile, the distribution of the lower-order thinking level consists of remember, understand and apply get 22 questions out of 30 questions. The indicator domain distribution of higher-order thinking level that consists of analyze skill (C4) gets 6 items and create skill (C6) gets 2 meanwhile there is no question belong to the evaluate skill (C5). Additionally, the indicator domain distribution of lower-order thinking level that consists of remember (C1) gets 15 items and understand skill (C2) only gets 1 item meanwhile apply skill (C3) gets 6 items. The score that can the researcher get from the table above; the score distribution of the higher-order thinking level gets 27% out of 100% meanwhile the score distribution of lower-order thinking level gets 73% out of 100%.

Table 3. The Cognitive Domain of Multiple Choices Reading Comprehension in the 2nd Formative Assessment

Cognitive Level	Total Questions	Percentage	Level of Thinking Skills
Remembering (C1)	14	60 %	LOTS = 96 %
Understanding (C2)	2	8 %	
Applying (C3)	8	32 %	
Analyzing (C4)	0	0 %	HOTS = 4 %
Evaluating (C5)	1	4 %	
Creating (C6)	0	0 %	
Total	25	100	

Based on the tables above, the distribution of the higher-order thinking level which consists of analyzing, evaluate and create skill only get 1 question out of 25 questions. Meanwhile, the distribution of the lower-order thinking level consists of remember, understand and apply get 24 questions out of 30 questions. The indicator domain distribution of higher-order thinking level that consists of analyze skill (C4) gets null items and evaluate skill (C5) get 1 item meanwhile there is no question belong to the create skill (C6).

Additionally, the indicator domain distribution of lower-order thinking level that consists of remember (C1) gets 14 items and understand skill (C2) only get 2 items meanwhile apply skill (C3) gets 8 items. The score that can the researcher get from the table above; the score distribution of the higher-order thinking level gets 4% out of 100% meanwhile the score distribution of lower-order thinking level gets 96% out of 100%. From the results of the second table, it can be seen that the results of the distribution of questions for higher-order thinking levels were not equal to the score distribution of the lower-order thinking level.

Table 4. The Cognitive Domain of Multiple Choices Reading Comprehension in the 3rd Formative Assessment

Cognitive Level	Total Questions	Percentage	Level of Thinking Skills
Remembering (C1)	18	60	LOTS = 80 %
Understanding (C2)	2	7	
Applying (C3)	4	13	
Analyzing (C4)	5	17	HOTS = 20 %
Evaluating (C5)	0	0	
Creating (C6)	1	3	
Total	30	100	

Based on the tables above, the distribution of the higher-order thinking level which consists of analyzing, evaluate and create level get 6 questions out of 30 questions. Meanwhile, the distribution of the lower-order thinking level consists of remember, understand and apply gets 24 questions out of 30 questions. The indicator domain distribution of higher-order thinking level that consists of analyze skill (C4) gets 5 items and evaluate skill (C5) get null item meanwhile only 1 question that belongs to the create skill (C6).

Additionally, the indicator domain distribution of lower-order thinking level that consists of remember (C1) gets 18 items and understand skill (C2) only get 2 items meanwhile apply skill (C3) gets 4 items. The score that can the researcher get from the table above; the score distribution of the higher-order thinking level gets 20% out of 100% meanwhile the score distribution of lower-order thinking level gets 80% out of 100%. From the results of the second table, it can be seen that the results of the distribution of questions for higher-order thinking levels were not equal to the score distribution of the lower-order thinking level.

Table 5. The Cognitive Domain of Essay Reading Comprehension in the 4th Formative Assessment

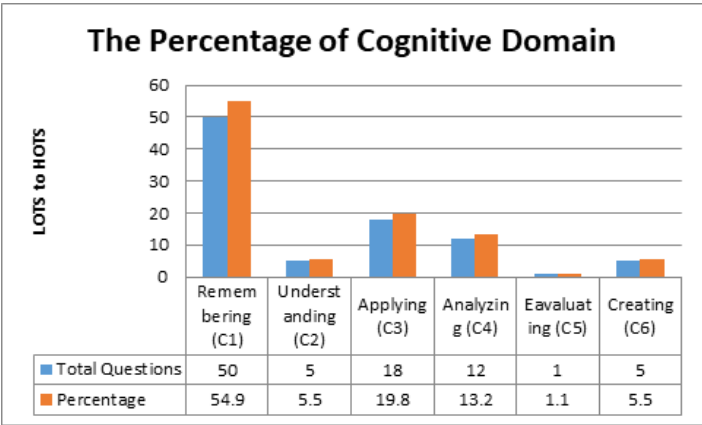
Cognitive Level	Total Questions	Percentage	Level of Thinking Skills
Remembering (C1)	3	50	LOTS = 50 %
Understanding (C2)	0	0	
Applying (C3)	0	0	
Analyzing (C4)	1	17	HOTS = 50 %
Evaluating (C5)	0	0	
Creating (C6)	2	33	
Total	6	100	

Based on the tables above, the distribution of the higher-order thinking level which consists of analyzing, evaluate and create level get 3 questions out of 6 questions. Meanwhile, the distribution of the lower-order thinking level consists of remember, understand and apply also get 3 questions out of 6 questions. The indicator domain distribution of higher-order thinking level that consists of analyze skill (C4) only gets 1 item and evaluate skill (C5) get null item meanwhile only 2 questions that belong to the create skill (C6).

Additionally, the indicator domain distribution of lower-order thinking level that consists of remember (C1) get 3 items and understand skill (C2) get null item meanwhile apply skill (C3) also get null items. The score that can the researcher get from the table above; the score distribution of the higher-order thinking level gets 50% out of 100% meanwhile the score distribution of lower-order thinking level also gets 50% out of 100%. The results of this table show that there is a balance in the distribution of higher-order thinking levels and lower-order thinking levels, this is marked by the score obtained by the distribution of higher-order thinking level questions is 50% and the scores obtained by the distribution of lower-order questions -order thinking level equal to 50%.

Based on data obtained by researchers, it can be seen that the distribution of the skill from higher-order thinking levels and the skill from lower-order thinking levels is not balanced. The total items of the reading comprehension daily test totaled 91 questions. Based on the data analysis of the distribution, it shows that the remember skill obtains the highest distribution among the other skill. In the second place, there is the apply skill and the third place of the lower-order thinking level skill was the understand skill. Additionally, the skill distribution of the higher-order thinking level itself can be seen that the analyze skill is the highest skill among the skill of higher-order thinking level. The create skill occupies the second-highest place while the evaluate skill was the last. The result of the data analysis infers that the making of daily test questions based on higher-order thinking level apparently there are still many questions based on lower-order thinking level itself. To clarify the distribution of higher-order thinking level questions and the distribution of lower-order thinking level questions, the researcher conclude the distribution questions in the skill domain of higher-order thinking level and lower-order thinking level from four formative assessments.

Table 6. The Percentage of LOTS to HOTS from Four Formative Assessments



Developing assessment based on higher-order thinking skills in the midterm and final semester exams certainly requires students to prepare a lot to be able to face the exam. Therefore, teachers should upgrade the assessment model in class especially in administering formative assessment. The results of the analysis data showed that the lower-order thinking level obtained higher distribution than the higher-order thinking level. It is proven by the result of the data analysis which showed that the lower-order thinking level obtained 80.2 %. Meanwhile, the higher-order thinking level obtained 19.8 % out of 100%. The total of the question were 91 items of questions. The lower-order thinking level got 73 questions while the higher-order thinking level obtained 18 questions. Thus, there was an inequality numbers in the distribution of the higher-order thinking level and the lower-order thinking level in the reading comprehension formative assessment.

The questions from the lower-order thinking level are very common and are often found in lesson plans, these questions are also the easiest to answer for students and easier for students to make teacher with limited time. Some of the distribution of questions based on higher-order thinking level looks much more complex than questions with lower-order thinking level. These questions are indeed more complex because they aim to help students think more critically, creatively and innovatively Airasian and Russel (2008: 113),. This statement also supported by the statement of Heong (2011:10), which states that higher-order thinking is using thinking widely to find a new challenge. Higher-order thinking skills demand someone to apply new information or knowledge that he has got manipulate the information to reach the possibility of an answer in the new situation.

Based on data analysis there is an imbalance between the distribution of higher-order thinking level questions and lower-order thinking level problems. However, the percentage meets the criteria of the minimum standard of HOTS questions in national exams i.e. 10-15%, but it is lower when compared to HOTS questions in the PISA assessment, which

is a minimum limit of 20%. The domination of HOTS questions in this research refer to cognitive analysis (C4) which is 13.5% of the questions. Compared with other study by (Mahendra et al., 2020), they found that 9.47% of teachers' formative assessment questions are categorised as HOTS questions. (Amua-Sekyi, 2016) has similar findings with this research which examination questions were dominated by the knowledge and comprehension skills and it was classified as LOTS level of questions.

As the first skill in the higher-order thinking level, the analyze skill was the highest number among the three skills in the higherorder thinking level. The analyze skill obtains 12 questions out of 91 questions or 13%. It might the highest number among the three skills in the higher-order thinking level but when compared to the other six skills, it is still considered as the small distribution. It might happen because (Brookhart, 2010) points out that it is a must to create such questions that ask the students to describe and figure out how one thing to others are related. Additionally, analyze skill does get the highest score than the three-skill of higher-order thinking level, but basically, this score is still lack when compared to the 6 other skills. The analyze skill obtains get 12 questions from 91 questions. But the question is still the same as the other questions. However, it can be inferred that the types of analysis are not too varied. (Chin & Osborne, 2008) claimed that the students need to improve their analysis skill by answering other kinds of analysis question rather than reasoning types of question such as classifying, differentiating, and outlining. Therefore, the types of analyze questions could be more varied with the types of question which ask students to connect conclusions with supporting statement or distinguish relevant from a different material.

The second skill was the evaluate skill. There was only 1 question out of 91 questions that belong to the evaluate skill. It might happen because the evaluate skill was the challenging one this statement also supported by Brookhart (2010: 42) he said that, evaluate skill is one of the most critical thinking skills in the reading skill so it is such a challenging and difficult

to answer or even to create. However, this kind of question can also be modifying by requiring literary criticism about the thing and asking about the quality of the text based on the reader and asking them the reason. With only 1 question, it can be said that there is an imbalance in the distribution of the evaluate skill with the other skills. However, the evaluation question should be more varied and teachers should be added more to the evaluation question.

The last category was the create skill which obtains 5 questions out of 91 questions. It might happen because (Chin & Osborne, 2008) claimed that the create question had difficulty answering. They also add that the synthesis or create skill is important in college because the lecture will ask the students to think about discrete items of information in order to arrive at a deeper understanding. Based on data analysis the create question quite good but it could be more varied.

Finally, from the results of data processing the researchers can conclude that the formative assessments based on higher-order thinking levels administered by the teacher still have some questions that can be categorized as questions based on lower-order thinking levels. The highest skill of higher-order thinking skill was the analyze skill meanwhile the lowest skill of higher-order thinking level was the evaluate skill. Therefore, the score of the create skill is not so far from the score of the analyze skill. The most important thing that has to be a concern for the teachers is the evaluate skill which only obtains 1 question. In fact that the evaluate skill was the most challenging skill among the other skill. The evaluate skill is necessary for students because it trains them to be more critical and could make a good argument. It also can be seen that the variation of those higher-order thinking questions is not too varied. Hence, the researchers think that the variation of the higher-order thinking questions should be enriched so that students could improve properly

D. Conclusion

Implementing higher-order thinking-based tests at the end of the semester exams needs the quality of existing assignments and formative assessments. A formative assessment based on a higher-order thinking level is expected to help students deal with the final exam questions later. The researchers chose to focus on reading comprehension of formative assessments. This is because reading is a complex skill among English language basic skills. After doing the content analysis by using the checklist table as an instrument for reading comprehension of formative assessments, the researchers conclude that the distribution of the higher-order thinking skill is lower than the distribution of the lower-order thinking skill. The analyze skill (C4) dominates the HOTS questions which reaches 13.2% of the questions. While, the evaluate skill needs to be improved because it only obtains 1% of the total questions.

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