Making Analysis of Higher Order Thinking-Based Objective Test at State Junior High School 5 Banda Aceh

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Abstract: It is often time that the question items which are made by the teacher do not meet the criteria of the needed standardized test. It might happen because a teacher does not often pay attention how to devise the correct questions well. A good question should consider students’ critical thinking ability. In terms of this, the critical thinking needed is High Order Thinking Skill (HOTS). This study aimed at describing the use of HOTS on the questions of objective test within the subject matter of natural science at the grade seven of Sate Junior High School 5 Banda Aceh. The researcher tried to describe the development of HOTS on the questions of objective test within the subject matter of natural science at the grade seven of State Junior High School 5 Banda Aceh. The result of analysis found that only 14 out of 25 question items which fulfilled the criteria of the development of HOTS and 11 question items did not meet the criteria of HOTS development.

1. Introduction

The teacher is one of main components in the process of teaching and learning in school. Without a teacher the learning process does not take place optimally. Thus, a teacher must have a good ability especially in mastering the learning material that will be taught, organizing the classroom well, and making an evaluation from teaching and learning process. One of competences that the teacher must have is the ability of making and developing of the evaluation instrument of students’ learning outcome. The evaluation is an effort to identify whether a planned program has met the standard that has been determined and to look at the effeciancy and effectiveness of a learning process implementation.

Educational experts have formulated a set of evaluation processes as categorized by collecting information which will become a basic to determine the appropriate decision, it is an important process in teacher education, but there are other parties that often neglect the evaluation process itself. It is a continuing process, before, in progress, and after the process of learning and teaching.

While, learning evaluation is a whole, continuing and systematic process in order to control, assure, decide the quality various learning components based on the particular consideration and criteria as a form of the teacher’s responsibility within learning implementation. The following is some experts’ opinions regarding to evaluation. In relation to learning activity, evaluation has some definitions...
namely, According to Bloom (1971) [1], evaluation is the collection of reality which is systematically done to decide whether in its reality occurs the change in students themselves and decide how far the level of change on a student individually. Then Mehrens and Lehman explained that [1] generally evaluation is a process to plan, attain, and provide the needed information to make various alternative decisions. Other while Oemar Hamalik [2] assert “evaluation is a continuing process related to information interpretation and collection to assess the decisions that have been made in designing a teaching system. The formulation has three implications as follow, (a) evaluation is a continuing process, not at the end of teaching; but it begins before teaching implementation until the teaching finishes. (b) Evaluation process is intended for a particular goal to find out the answers how to improve a teaching. (c) Evaluation must use the meaningful and accurate measurement instrument to gather the needed information for making a decision.

In its practice at school, one of instruments or evaluation instrument is commonly used to know students’ learning outcome is the type of test. Test is one of instrument types which is used to know students’ability in absorbing the learning that is given by the teacher. It agrees with Indrakusuma’s opinion [3] that states “test is a tool or objective and systematic procedure to gain the data or information which are needed properly and quickly about someone.” Test functions as a measurement tool toward students and successful learning and teaching in the class. Generally, test is classified into some categories, one of them is summative test. Summaative test is commonly held at the end of a teaching program or it is called the semester midterm examination. Summative test aims at determining the value that shows students’ success after taking learning process in a particular period in order to know whether the student can continue to the next teaching or not.

Test form or the questions that are commonly used in summative test in the form of written test (objective test). Objective test is the test which its answers have been provided to answer the question items. The questions in the form of objective test consist of some types; one of them is multiple choice test. Multiple choice test is the question which its answer must be selected from some the provided answers. The strengths of multiple choic test are to have the materials that cover a bit bigger from the question is tested, to have high and reliability and validity level compared to essay. In its administration, it is easier because the teacher can measure a variety of cognitive domains, and the assessment is easier and faster. Conversely, there are some weaknesses from multiple choice test such as the way how to make multiple choice tests because it needs much time, students’ answers have not yet shown the real result since students’ opportunities in guessing the answer is quite big, it is quite difficult to measure students’ thinking ability, and has the difficulty in determining homogeneity and reasonable answers.

Meanwhile, according to Putra [4] multiple choice test has strengths and weaknesses. The strength of the test is more effective and flexible, covers almost all learning materials; is appropriate to measure information disentanglement, vocabulary, various definitions, principle application, formula, to interprete data, to measure students’ ability in making interpretation, to do the choice, to discriminate, to determine the opinion based on a particular reason, to draw the conclusion, correction and objective and easy its assessment and can be used repeatedly. While, the weakness of multiple choice test is difficult and takes time in designing the questions, can not be used to measure students’ skill in organizing the material.

The reality in the field based on the interview with the teacher of Junior High School 5 Banda Aceh, on 20 February 2016 found that the teacher did not make the semester midterm examination on the subject matter of natural science of grade 5, but the questions were taken from the book and question bank in the internet which were relevant to the materials that would be tested to students. In addition, from the result of observation and documentation study on 14 February 2016 revealed the questions of the semester midterm examination on the subject matter of natural science were designed and organized by the teacher tended to measure only cognitive aspect. Whereas, the textbooks that supported learning activity in school that had provided various materials that can encourage students to learn more active and present a variety of systematic concepts. However, in assessment process and its evaluation were less to train students’ thinking ability. To overcome this problem, the teacher must
be competent to make and develop the questions of natural science which can train students’ thinking ability. To help the teacher in making the questions of natural science that can increase students’ thinking ability can be used the development criteria of HOTS question.

Presseisen [5] points out “HOTS (High Order Thinking Skills) or the skill of high level thinking divided into four categories namely problem solving, decision making, critical thinking and creative thinking.” Critical thinking group is more emphasized here. Critical thinking is the activity of thinking that is deeper about various things to achieve a conclusion. This things agrees with Ennis’s opinion [6] that states “critical thinking is the process of reflective thinking which focuses on deciding what should be done.”

The purpose of critical thinking is to examine a statement, opinion or idea. Furthermore, Ennis (ibid) assert “the indicator of critical thinking skill falls into five categories namely giving simple explanation, building basic skill, concluding, making further explanation and organizing strategy and tactic.” From the five indicators above then developed into 11 indicators. In line with this, Ennis [6] states “the 11 indicators are focusing on the question, analyzing argument, considering believable thing, considering observation report, comparing the conclusion, determining the conclusion, considering inductive ability, assessing, defining the concept, defining the assumption, and describing.”

2. Method
Research method is the guidance for the researcher related to the steps of a research which were used to find out, prove, and develop the knowledge. The research method used in this study was qualitative method. Qualitative method is one of methods which describes and investigates a phenomenon which occurs in the natural setting. While, the research design of this study is a descriptive research. The design of descriptive research is a research technique that portrays the general facts that are found, then analyzed based on the theories which are relevant to the problem is being investigated to find out the answer from the problem is being researched.

There were 28 respondents that contained the teachers and the students of grade 7 of Junior High School 5 Banda Aceh became the participants in this study. The reason why the participants were chosen because they considered knowing information or data were needed by the researcher for the research was being conducted. The instruments used to obtain the data in this study were observation, interview, and documentation study. In order to attain the data through interview, the researcher used the interview guide which contained a number of questions for the participants. Meanwhile, to obtain the data from observation the researcher used the observation guide, then documentation was gained from the document of semester midterm examination of grade 7 of Junior High School 5 Banda Aceh.

The data will be processed with standard statistic and then divided into four categories namely problem solving, decision making, critical thinking and creative thinking. The next step the data will be consult to the criteria of HOTS where is (0 to 1.50) is “not good”, (1.51 to 2.50) is “less good”, (2.51 to 3.50) is “good enough” and (3.51 to 4.00) is “good”. After the collected data then the next step was to analyze them. The data that were gathered from the result of observation interpreted to answer the research problem. For the data from the result of interview was made into the transcript of interview and reduced them by taking the relevant data and information that agreed with the research problem. While, data analysis from the documentation was done by identifying and analyzing between the appropriateness of question and the criteria of HOTS question development, then after that it can be obtained the description whether the questions were suitable or not the criteria of HOTS question development. After the researcher attained the analysis result of observation, interview, and documentation, then they were combined and used as the data for the researcher to answer the problem formulation.

3. Results and Discussion
Having conducted the research at State Junior High School 5 Banda Aceh about the analysis of HOTS on objective test within the subject matter of natural science of grade 7 found that there were only 9
question items fulfilled the criteria of the development of HOTS question and 16 question items did not meet the criteria of HOTS development.

Having analyzed between the appropriateness of question and the criteria of HOTS question development, the next step that the researcher did was to assess its appropriateness from the whole question items that had previously been analyzed by using the guidance of analysis in the forms of the criteria of HOTS question development to know which question item was good, good enough, less good, and not good. The Table of the Analysis Item of the Test as shown below:

| No. | No of Item | Criteria                        | Assessment          | Value |
|-----|------------|---------------------------------|---------------------|-------|
| 1   | Item No 1  | Low Order Thinking Skills       | Not Good            | 1     |
| 2   | Item No 2  | Low Order Thinking Skills       | Good Enough         | 3     |
| 3   | Item No 3  | -                               | Not Good            | 1     |
| 4   | Item No 4  | Questioning                     | Good                | 4     |
| 5   | Item No 5  | Low Order Thinking Skills       | Less Good           | 2     |
| 6   | Item No 6  | Analyzing Argument              | Good                | 4     |
| 7   | Item No 7  | Low Order Thinking Skills       | Good Enough         | 3     |
| 8   | Item No 8  | Low Order Thinking Skills       | Less Good           | 2     |
| 9   | Item No 9  | Questioning                     | Good                | 4     |
| 10  | Item No 10 | -                               | Not Good            | 4     |
| 11  | Item No 11 | -                               | Not Good            | 1     |
| 12  | Item No 12 | Considering the Believable Thing| Not Good            | 1     |
| 13  | Item No 13 | Low Order Thinking Skills       | Less Good           | 2     |
| 14  | Item No 14 | Questioning                     | Good                | 4     |
| 15  | Item No 15 | Low Order Thinking Skills       | Not Good            | 1     |
| 16  | Item No 16 | Analyzing Argument              | Good                | 4     |
| 17  | Item No 17 | Low Order Thinking Skills       | Not Good            | 1     |
| 18  | Item No 18 | -                               | Not Good            | 1     |
| 19  | Item No 19 | Low Order Thinking Skills       | Not Good            | 1     |
| 20  | Item No 20 | Low Order Thinking Skills       | Less Good           | 2     |
| 21  | Item No 21 | Questioning                     | Good                | 4     |
| 22  | Item No 22 | Low Order Thinking Skills       | Less Good           | 2     |
| 23  | Item No 23 | Low Order Thinking Skills       | Not Good            | 1     |
| 24  | Item No 24 | Low Order Thinking Skills       | Not Good            | 1     |
| 25  | Item No 25 | Low Order Thinking Skills       | Not Good            | 1     |

On the section of this discussion will present and explain the research findings and the analysis of the questions of objective test within the subject matter of natural science at the grade seven of Sate Junior High School 5 Banda Aceh. From the result of analysis found that there were only 9 out of 25 question items which fulfilled the criteria of the development of HOTS question and 16 question items did not meet the criteria of HOTS development.

HOTS (High Order Thinking Skills) or the skill of high level thinking divided into four categories namely problem solving, decision making, critical thinking and creative thinking. In this research Critical thinking is the process of thinking that is deeper about various things to achieve a conclusion. In critical thinking there are some skills that can be developed and used as the reference which examines students on the higher level. The following is the skills of critical thinking according to Ennis’s [4] namely focusing on the question, analyzing argument, considering the believable thing, considering observation report, comparing conclusion, determining conclusion, considering inductive ability, assessing, defining the concept, defining the assumption, and describing.
From the result of analysis found that 4 out of 25 questions categorized on the criteria ‘questioning’ on the items 4, 9, 14, and 21. For 3 question items involved into the criteria ‘analyzing argument’ on the items 6, and 16; and 1 question item was found on the criteria ‘considering the believable thing’ on the item 12. While, other question items categorized at the level of Low Order Thinking.

From the whole assessment analysis toward 25 question items, they can be categorized respectively as follow: 7 question items categorized into ‘good’; 2 question items ‘good enough’; 5 question items ‘less good’; 11 question items ‘not good’. The total number form the assessment was 54 with the average score 2.16. This average score if it was seen from the assessment criteria categorized into ‘less good’ which its range was from 1.51 to 2.50. It meant that a part of the question items of objective test within the subject matter of natural science at the grade seven of State Junior High School 5 Banda Aceh, were designed and arranged by the teacher had not met the criteria of the development of HOTS question.

4. Conclusion
From the results of research that have been explained on the section of finding and discussion about the analysis of HOTS (High Order Thinking Skills) on the objective test within the subject matter of natural science at the grade seven of State Junior High School 5 Banda Aceh, and the result of analysis toward the items of objective test in the form of multiple choice test on the semester midterm examination of grade 7 of State Junior High School 5 Banda Aceh can be concluded 14 question items meet the criteria of the development of HOTS question and 11 question items do not meet the development criteria of HOTS question and categorize on the criteria ‘not good’.

Wholly, having analyzed by using the reference of question analysis that forms the development criteria of HOTS and the assessment criteria toward each question item obtained the total number form the assessment was 54. After counting its average gained with the average score 2.16. This average score if it was seen from the assessment criteria categorized into ‘less good’ which its range was from 1.51 to 2.50. It was seen from the assessment criteria of whole question, a part of the question items of objective test within the subject matter of natural science of State Junior High School 5 Banda Aceh, had not met the development criteria of HOTS question.

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