AN ANALYSIS OF DISTRIBUTION AND DIFFICULTY LEVELS OF LINGUISTIC QUESTIONS ON COGNITIVE DOMAIN IN INDONESIAN SUBJECT AT GRADE EIGHT OF SMP 1 TAKENGON

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Abstract

This study aims (1) to describe the distribution of linguistic questions of cognitive domain on the second semester final exam year 2013/2014 in Indonesian subject at Grade Eight of SMP 1 Takengon and (2) to describe the difficulty levels of linguistic questions of cognitive domain on the second semester final exam year 2013/2014 in Indonesian subject at Grade Eight of SMP 1 Takengon. The method used in this research is a quantitative descriptive. Data were obtained through documentation techniques. The results of this study show that (1) there are several levels the distribution of linguistic questions of cognitive domain on the second semester final exam year 2013/2014 in Indonesian subject at Grade Eight of SMP 1 Takengon i.e. C1 level items at 54% classified as unbalanced, C2 level items at 23% classified as unbalanced, C3 level items at 17% classified as unbalanced, and C4 level items at 6% classified as unbalanced and (2) there are the difficulty levels of linguistic questions of cognitive domain on the second semester final exam year 2013/2014 in Indonesian subject at Grade Eight of SMP 1 Takengon i.e. category of the easy items at 57% classified as unbalanced, category of the medium items at 37% classified as unbalanced, and category of the difficult items at 6% classified as unbalanced. From results of this study proved that (1) the distribution of linguistic questions on cognitive domain not balanced by the percentage proportion balancing of the items for grade of the SMP and (2) the difficulty levels of linguistic questions on cognitive domain not balanced by the percentage proportion balancing for amount of the items. Thus, an evaluation of distribution and difficulty levels of linguistic questions on cognitive domain on the second semester final exam year 2013/2014 in Indonesian subject at Grade Eight of SMP 1 Takengon still require adjustments in the future.

Keywords: *analysis, distribution of cognitive domain,difficulty levels of cognitive domain.*

Introduction

The study deals with the analysis of the distribution and difficulty levels of linguistics questions on cognitive domain of Bloom. This level includes memory or knowledge (C1), comprehension (C2), application (C3), analysis (C4), synthesis (C5) and evaluation (C6). They are assessed based on the distribution of cognitive domain and difficulty level of linguistics questions in second semester examination 2013/2014 of Indonesian Subject for Grade Eight in SMP 1 Takengon. There are two aspects of Indonesian subject; they are language aspect and literary aspect. Aspect of language and literary become one of the discussion topic for Indonesian subjects in school. Both aspects are combined in Indonesian subjects, but both of them have a different space in science. Therefore, this study will limit the study on language aspect which relates to analysis of question items.

Language aspect in Indonesian subjects plays an important role in learning process. Linguistic competence which is formed on students' mind can support them to communicate in school. With the sufficient linguistic competence owned by students, systematic and directional communication can be established. Nurgiyantoro (2009: 199) says that the linguistic competence should be taught and tested because these competences are seen as a prerequisite to gain control of communicative competence.

Learners who already have communicative competence will be easier to develop science, either in language knowledge or other science fields.

Indonesian subject has a passing standard that has to be achieved by students. Minister of Education and Culture of Republic Indonesia has set a graduation standard to be achieved by students. The standard has become government policy in education. Determination of the Regulation of Education and Culture Minister No. 54, 2013, article 1 about competency standard is used as the primary reference standard in educational assessment. For cognitive aspect, junior high school graduations need to have factual, conceptual, and procedural knowledge in science, technology, art, and culture with insight of humanity, nationality, and civilization related to phenomena and eyes caught events.

Students' cognitive development supports the achievement of passing grade standards for Indonesian subject in school. Teachers need to develop students' cognitive skill to achieve the passing grade set by the Ministry of Education. Learning outcome which is important to help student in achieving passing grade standard is cognitive aspect. Bloom (in Sudijono, 2008: 49) states that all efforts related to brain activity are included in cognitive domain. How brain works can be measured by conducting a test. This is done to determine learning outcomes. Hamalik (2008: 159) says that learning outcome refers to learning achievement. It means that there is an achievements and change in the behavior of students.

Based on preliminary observation, researchers obtain some information about the preparation of linguistic question in SMP Negeri 1 Takengon, they are:

1) Linguistic questions made by the teachers of SMP Negeri 1 Takengon have never been analyzed based on distribution and difficulty level.
2) Linguistic questions made by the teachers in SMP Negeri 1 Takengon do not follow the rules, in which they do not refer to indicators and question prediction told by teacher. They only write out question from various books without concerning material that have been taught.
3) The teachers in SMP Negeri 1 Takengon do not understand cognitive aspect in preparing the question. They have difficulty in determining the operational verb in cognitive levels of Bloom's Taxonomy. Even that they have joined the MGMP (Subject Teacher Conference), they still do not truly comprehend cognitive level. They do not have the confidence and courage to discuss farther.

Based on the fact stated above, the researcher is interested to conduct a research on evaluation. The evaluation will determine decision making so that teachers will be guided in developing students' competencies. For the purpose, the researcher will review the distribution and difficulty level of linguistic question on cognitive aspect of Indonesian subject in Grade Eight of SMP Negeri 1 Takengon. The word evaluation which is an English word rooted from the word "value" which means score. Purwanto (2012:180) stated that the major concept in evaluation is about value (product of evaluation consist of score that will be used for next action). By using evaluation, a decision can be planned and organized as needed. Thoha (20013:1) stated that evaluation is a planned activity to understand the condition of an object by using instrument and the result is compared with the indicators to take a conclusion.

Peng and friends (2009) explained that evaluation is an integral part of the educational reform and innovation process. It means that evaluation is integrated part from process of educational reformation and innovation. So it can be stated that evaluation has a potency to act as the stimulus to achieve the educational superiority. Furthermore, an action needs to be planned and executed carefully. With other word, each educational program has a big influence. There are many obstacles that have to be considered to avoid negative result.

According to Daryanto (2010:11), the main purpose of doing evaluation in teaching and learning process is to gain accurate information about students' achievement of instructional purpose, so that the next move can be planned. Instructional purpose is aimed to comprehend the relationship between curriculum and learning activity. As stated by Sukmadinata (205:2), instructional purpose is a purpose which is formulated from learning material, topic and subtopic that will be taught by teacher. The formulation of this purpose will help teacher to plan what should be achieved by students after finishing learning activity for a certain time.

Tayibnapis (2008:4) stated that evaluation has two functions; first is formative function which is used as correction and development tool of ongoing activity (program, person, product, and so on), and the second is summative function which is acted as accountability, information, selection or continuation. Both of them can be used to know the progress and development after finishing a learning activity for a specific period. Thus, evaluation helps in developing implementation and education system.

Cognitive level which is included in Bloom taxonomy is introduced by Benjamin Samuel Bloom in 1956. This level can be used to measure intelligence abilities that are arranged from the lowest to the highest. The intelligence covers knowledge, comprehension, application, analysis, synthesis, and evaluation. Initial name for the six levels is knowledge (C1), comprehension (C2), application (C3), analysis (C4), Synthesis (C5), and evaluation (C6).

Athanassiou (2003: 535) revealed that Bloom's taxonomy is a six-level classification system that uses observed students behavior to infer the level of students' achievement. It means that Bloom's taxonomy is a classification system that can be used to observe students' behavior in concluding their achievement. It acts as the reference to estimate level of students' ability that includes memory or knowledge, comprehension, application, analysis, synthesis, and evaluation. The level used to interpret students' intellectual level.

Anastasi (in Sudijono, 2008: 66) said that test is measuring tool that has an objective standard used to measure and compare mental state or behavior of individuals. Test is used as tool to compare condition of individuals. Suryabrata (in Thoha, 2003: 2) also explained that test is the questions that must be answered or commands that has be run so that investigator can draw conclusion by comparing it with other standard or test.

Test can determine students' achievement level. Collegiate (in Daryanto, 2010:35) stated that test is any series of questions or excercise or other means of measuring the skill, knowledge, intelligency, capacities of aptitudes or an individual or group. It means that test is a set of questions used to measure skill, knowledge, intelligence, ability and talent that is owned by an individual or group. This is regarded as the deliberate attempt to determine students' achievement.

Test made by teacher can be called achievement test. Sukmadinata (2005: 33) says that achievement test is a test used to assess the results of lessons given by the teachers to the students. This assessment aims to measure student's success rate. The compilation process of test is managed by the respective subject teachers. Teachers who carry out the teaching and learning activity choose materials that are taught in accordance with the objectives that want to be achieved. With the presence of these materials, teachers can devise a test to assess the learning success. Therefore, teachers know what is learned, so that they can make a good test or measuring instrument for students.

Djiwandono (2008: 75) says that teachers have sufficient knowledge to prepare a good test. Teachers deemed to know the behavior and ability of their students. Teachers also know teaching materials used in teaching and learning activities. Thus, it provides a lot of information needed to plan test systematically, so that the test prepared by them can be customized properly.

Daryanto (2010: 278) said that achievement test is a test that is used to see the results of the lessons that have been given by teachers to learners within a certain time period. The test prepared by the teacher to evaluate the success of learning process in school. Sanjaya (2010: 231) said that designing an evaluation tool is one step that should not be left out in planning and designing learning activity. Considered the complexity of evaluation, teachers need to have sufficient knowledge and skill. As stated by Mulyasa (2006: 62), teachers must have adequate knowledge and able to assess themselves, either as planner, implementer, or rater of learning program.

Questions that are included in a test need to be analyzed first to produce a good test. It is important to be implemented to improve the quality of questions in the test. Quality and value of a test is a must. In addition, analysis of questions helps to diagnose which one is effective and which one is ineffective question. Sukardi (2012: 153) explained that the need to analyze the test in order to make sure that the test that is made in accordance with the objective and rational construction tools.

Preparation of a test requires appropriate steps to produce good items. Ibrahim and Syaodih (2010: 98) said that there are three basic steps to be taken in constructing a test, they are (1) making of question summary, (2) arranging question and (3) assembling question. These steps can be described as follows

1) Making Questions Summary; The mapping included in questions summary taken as a guidance to write questions. It describes the distribution of questions from various topic based on certain level. So that the questions should include points that are developed from specific material.
2) Arranging Questions; A good process of arranging question should fulfill specific requirements. Referring to specific questions summary, the questions made should consider suitability in level, content and standard of question construction.
3) Assembling Questions; The questions that have been arranged should be analyzed again to revise the items. Its sequence, material and difficulty level need to be checked before producing a complete test.

Each item in test is formulated to know students' success in achieving learning outcome. Teachers need to understand this point before constructing a test. Sudijono (2008:99) said that test of learning result should be able to be used as tool to seek useful information to improve students' learning process and teachers' teaching ability. Thus, as a test composer, teachers have to master principles and assessment procedures of learning outcome test.

According to Nurgiyantoro (2009:161), linguistic test is a tool used to measure how much students have learnt a language. Material learned will make them in mastering theory or practice of the language. Theory means mastery toward language structure, while practice is ability to master language for communicative purpose.

According to Oller (in Nurgiyantoro, 209:138), item difficulty is a statement about how easy or difficult a question is for students who take the test. It is same with item facility which means how big a question item gives facility or easiness for students in answering question. Sudjana (2009:135) said that item difficulty is considered from the ability of students in answering questions, not from teachers' point of view as the questions maker. It declares that item difficulty is determined by students.

Questions difficulty level has an impact on the questions item order. It will deserve students in answering test if the difficult questions come first. Dwijawandono (2008:220) explained that placement of difficult questions that need deep thinking and a lot of time at the beginning test will have a negative effect because it will discourage students and cause a panic. It is suggested that the difficult item placed at the end section.

From the description above, the distribution of cognitive linguistic question and its difficulty level need to be noted specifically to measure the competence of students. This is done to determine the quality of the test based on the distribution and item difficulty. Therefore, the problems formulated in this study are (1) how is the distribution of cognitive linguistic questions in second semester examination 2013/2014 of Indonesian subject for Grade Eight in SMP Negeri 1 Takengon? and (2) how is the difficulty level of cognitive linguistic questions in second semester examination 2013/2014 of Indonesian subject for Grade Eight in SMP Negeri 1Takengon?

Research Methodology

This method used in this research is descriptive quantitative. Sukmadinata (2010:54) said that descriptive research is a research method that is aimed to describe existing phenomena, either in recent time or in the past. This research describes cognitive questions distribution that is analyzed from test made by teachers and item difficulty which is analyzed from students' correct answer. The description is interpreted through second semester examination 2013/2014 of Indonesian Subject for Eight Grade Class in SMP Negeri 1 Takengon.

Source of data in this study is the questions sheet and students' answer sheets in SMP Negeri 1 Takengon. The question items and the answer sheet are limited to linguistic aspects. Thus, this study looked at the distribution and difficulty level of question items, specifically on aspect of language. The question and answer sheets from of 211 students are taken from nine classes, 24 from room one, 25 from room two, 24 from room three, 25 from room four, 23 from room five, 23 from room six, 24 from room seven, 21 from room eight, and 22 from room nine.

Table 4

No.	Class VII	Number of Studens	Sex	
			Male	Female
1.	VIII-1	24 students	7 students	17 students
2.	VIII-2	25 students	9 students	16 students

No.	Class VII	Number of Studens	Sex	
			Male	Female
3.	VIII-3	24 students	7 students	17 students
4.	VIII-4	25 students	12 students	13 students
5.	VIII-5	23 students	9 students	14 students
6.	VIII-6	23 students	9 students	14 students
7.	VIII-7	24 students	8 students	16 students
8.	VIII-8	21 students	9 students	12 students
9.	VIII-9	22 students	6 students	16 students
	Total	211 students	76 students	135 students

Source of Data

The data needed is collected by using documentation technique. Document needed is questions item and students' answer sheets. The researcher limits the data only on question items for second semester examination 2013/2014 of Grade Eight in SMP Negeri 1 Takengon. After data is collected, the researcher does the following steps: 1) Select the question items and students' answer sheet; 2) Collect the question items and students' answer sheet; 3) Make the answer key; 4) Check students' answer.

Then, the distribution of cognitive domains analyzed per question item. This study outlines the material and instruction in question item. By using the description above, complexity and cognitive domain can be divided into level C1, C2, C3, C4, C5, or C6 for each question item. As was said by Nurgiyantoro (2009: 40), thing that can be used as guidelines to distinguish the six cognitive levels are complexity and cognitive way of working that are required in the test item. Thus, the distribution of cognitive domains can be identified by knowing the complexity and cognitive way of workings for all items that will be determined.

After that, every item is analyzed its difficulty level. Djiwandono (2008: 218) said that the difficulty level is calculated from the ratio between the number of candidates who can and can not answer questions correctly. With the results of this comparison, the item difficulty will be seen. Daryanto (2008: 180) says that the formula to find the calculation of the difficulty level is as follow.

$$P = \frac{B}{JS}$$

Explanation
P = difficulty index
B = amount of students who answer correctly
JS = amount of test participant

Item difficulty is distinguished by index. The index used as the difficulty standard is difficult item, moderate item and easy item. The index difficulty level can be interpreted by criteria in the following table.

Table 5. Difficulty level interpretation

Difficulty level index	Criteria
0 – 30	Difficult category
31 – 70	Moderate category
71 - 1,00	Easy category

Source: Sudjana (2009:137)

Result and Discussion

Based on data processing, it can be known that the result of distribution analysis of question items which can be seen from complexity or the way of working cognitive aspect toward linguistic question items. The research result shows that the questions distribution for knowledge level (C1) is 54 %, understanding level (C2) is 23%, application level (C3) is 17%, and analysis level is 6%. As suggested by curriculum (in Nurgiyantoro 2009:40), the proportion balance of the six cognitive levels should be as shown in the table below.

Table 9
Assessment Proportion Balance of Cognitive Level for Junior High School Students

Cognitive domain	**Proportion in percentage**						
School Grade	**Knowledge C1**	**Understanding C2**	**Application C3**	**Analysis C4**	**Synthesis C5**	**Evaluation C6**	**Total**
SMP	35%	40%	20%	5%	-	-	100%

Accordingly, the distribution percentage of cognitive linguistic questions from the results of this study should be adjusted to the proportion balance of six cognitive levels for junior high school students. The adjustment can be done by changing the percentage proportions as follows:

1) The result of linguistic question distribution that reaches 54% should be decrease to 35%.
2) The result of cognitive linguistic questions distribution for understanding level that reaches 23% should be increase to 40%.
3) The result of cognitive linguistic questions distribution for application level that reaches 17% should be increase to 20%.
4) The result of cognitive linguistic questions distribution for analysis level that reaches 6% should be decrease to 5%.

From the results of data processing, it can be seen the analysis of difficulty level of linguistic question for cognitive domain in second semester examination 2013/2014 of Grade Eight in SMP Negeri 1 Takengon. It can be seen from the calculation results of students who are able to answer the items correctly. The results of this study indicate that the difficulty level in the easy category of cognitive domain is 57%, 37% for moderate category, and for difficult category is 6%. As revealed by Sudjana (2009: 135), the basic consideration in determining the proportion of difficulty percentage is based on the normal curve, which is 30% for the easy category, 50% for the medium category, and the rest 20% for difficult category. Comparison between items easy-moderate-difficult is 3-5-2.

In correlation with that, difficulty percentage level of linguistic question items for cognitive domain from the research is suggested to be adapted with the proportion of normal curve. The adaptation can be done by changing the proportion percentage as follow:

1) Difficulty level of cognitive linguistic question for easy category that reaches 57% should be changed to 30%.
2) Difficulty level of cognitive linguistic question for moderate category that reaches 37% should be changed to 50%.
3) Difficulty level of cognitive linguistic question for difficult category that reaches 6% should be changed to 20%.

Based on the explanation above, the results of research on the distribution analysis of cognitive linguistic questions in second semester examination 2013/2014 of Grade Eight in SMP Negeri 1 Takengon is not balanced with the percentage proportion of linguistic items amount. In addition, the results of research on the analysis of difficulty level of cognitive linguistic question in second semester examination 2013/2014 of Grade Eight in SMP Negeri 1 Takengon is also not balanced with the percentage proportion of linguistic items on the normal curve. In conclusion, distribution assessment and questions difficulty level of cognitive domain still require an adjustment.

Conclusion

Based on the research, it can be concluded that analysis result on questions distribution and item difficulty of cognitive domain in second semester examination 2013/2014 of Grade Eight in SMP Negeri 1 Takengon is not balanced to amount of percentage proportion questions. It is proved from the percentage of linguistic questions as follow.

There are some levels of questions distribution in second semester examination 2013/2014 of Grade Eight in SMP Negeri 1 Takengon. The conclusion drawn after 35 linguistic questions have been analyzed. The distribution detail are; questions percentage of level C1 is 54% which is categorized as not balanced, questions percentage of level C2 is 23% which is categorized as not balanced, questions

percentage of level C3 is 17% which is categorized as not balanced, and questions percentage of level C4 is 6% which is also categorized as not balanced. So, the linguistic question distribution in second semester examination 2013/2014 of Grade Eight in SMP Negeri 1 Takengon still needs to be adapted in the future.

There are some levels of difficulty for cognitive linguistic questions in second semester examination 2013/2014 of Grade Eight in SMP Negeri 1 Takengon. It can be seen from the analysis of 35 linguistic questions. The detail of difficulty level are; easy questions category is 57% which is categorized as not balanced, moderate questions category is 37% which is categorized as not balanced, and difficult questions category is 6% which is also categorized as not balanced. So, the difficulty level of linguistic questions in second semester examination 2013/2014 of Grade Eight in SMP Negeri 1 Takengon still needs to be adapted in the future.

Based on the research done, the researcher delivers a few suggestions about the related topic. First, teacher is encouraged to pay attention on distribution of cognitive domain and questions item difficulty, in which it is expected that the percentage proportion is balanced, especially for linguistic items. Second, teachers have to consider students' strength and weakness in designing test, so that students' ability can be measured well. Third, teachers are suggested to analyze more question items of Indonesian subject from any source to strengthen teachers' ability in making appropriate questions items. Fourth, teacher need to consult with other teacher about teaching material to improve the way of students' thinking in solving certain cognitive questions. Last, teacher is required to make questions items in accordance with the rule, so that teacher may give objective assessment.

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