



# PROCEEDING

## 8<sup>th</sup> PEDAGOGY INTERNATIONAL SEMINAR 2017

ENHANCEMENT OF PEDAGOGY IN CULTURAL DIVERSITY  
TOWARDS EXCELLENCE IN EDUCATION

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UNIVERSITAS PENDIDIKAN INDONESIA, BANDUNG



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PEDAGOGI KE-8 (PEDA8) 2017

*“ENHANCEMENT OF PEDAGOGY IN CULTURAL  
DIVERSITY TOWARDS EXCELLENCE  
IN EDUCATION”*

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## THE QUALITY OF ELEMENTARY SCHOOL SCIENCE EXAMINATION TEST ON COGNITIVE PROCESS DIMENSIONS IN CURRICULUM 2013

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### ABSTRACT

This study aims to determine the quality of elementary school science examination test in the cognitive process dimensions contained in the fifth grade students' handbook of Curriculum 2013. This research is a descriptive qualitative research. This research is done by identifying and then mapping based on the cognitive process dimension on the prepared guidance, which is mapping the science examination questions in the fifth grade students' handbook of Curriculum 2013. The cognitive process dimension in Bloom's Taxonomy Revision are grouped into: 1) Memorizing, 2) understanding, 3) Applying, 4) Analyzing, 5) Evaluating, and 6) Creating. The result of the research shows that the mapping of science examination questions of cognitive process dimension in the fifth grade students' handbook is that 162 item test problem of cognitive process dimension. Those 162 questions are mapped into: 1). Ability to memorize / remember as many as 35 questions or 17.85%, 2). understand / 117 questions or 59.7%, 3). Applying, 2 questions or 1.02%, 4). Analyzing as many as 8 questions 4.08%, 5). For evaluating, there is no item found in the ability to analyze the cognitive processes, 6). Creating, is not found a problem that is in the ability to create a cognitive process. Based on these results it can be seen that the lack of handbook students on Competency Test questions does not meet the criteria of questions that train learners using reasoning ability, problem solving, and developing thinking skills.

Keywords: quality of science examination item test, cognitive process dimension.

### INTRODUCTION

Along with the rapid of science and technology development, and the flow of globalization demands the quality of human resources. To improve the quality of human resources, one of the factors that become the center of government attention is the field of education. In order to realize the best quality of national education, the government formulated the National Education Standards. The National Education Standards are continuously updated to create an adaptive education for the times. The National Education Standards consist of 8 (eight) standards, one of them is the Assessment Standard that aims to ensure: (1) planning the learners assessment based on the competencies that need to be achieved and based on the principles of assessment; (2) the implementation of professional, open, educative, effective, efficient, and appropriate educational assessment in a socio-cultural context; And (3) reporting the results of the learners' evaluation objectively, accountably and informatively (Mendikbud, 2013b: 1).

The renewal of the national standard of education is also accompanied by the renewal. Curriculum KTSP 2006 is revised become Curriculum 2013 which is aims to produce Indonesian students who have the advantage of competence in the sphere of attitude, knowledge, and skills (Mendikbud, 2013a: 2). This is to compensate for the rapid development of science and technology in the 21st Century that requires the graduates to be able to compete in the global world. The revised of Curriculum 2013, one of them is in the scoring system. This assessment system, known as authentic assessment, accommodates high-level thinking skills.

This is motivated by the results of research PISA and TIMSS which provide a picture of the outcomes of science learning objectives in Indonesia which is still low. It indicates that science learning is still in low level with the emphasis of learning on the mastery of the concept (basic learning). Basic learning is explained by Dettmer (2006: 73) that is concerned with mastery of the concept so that the achievement of the learning process is limited to the aspects of knowing and understanding. Thus, the results of this study provide an illustration that the ability of higher order thinking of students is still at a low level.

High-level thinking skills can be developed in learning through various things. According to the results of Uswatun research (2015: 138), high-level thinking skills can be developed through learning tools. One component of the learning tool is a textbook as a learning resource for learners. Textbooks can be used as a media for developing high-level thinking skills in learning process. El-Saleh (2011: 2) asserts, "Textbooks are the primary physical resource for student performance in the classrooms." Those explanations corroborate the evidence that textbooks are used as sources of learning in the classroom activity, because textbooks can be used oftenly by the learners compared with the classroom teacher.

Textbooks can also be used as a "tool" to achieve the expected goals. Costanzo (2009: 4) states, "Textbooks purpose is to serve as a vehicle for the transmission of knowledge, and it is important not to overlook the social dimension within that knowledge is made legitimate". Textbooks are provided directly to students with the aim of the student being able to discover his own given knowledge. The teacher in this case is only a facilitator of learning process.

Textbooks have a high frequency of direct contact with students. It aims to develop students' memory of encouraging the transfer process. Memory or retention is a student's ability to remember lesson material moments after they have learned. In this regard, Mayner & Wttroc (1996) in Suwanto (2010: 83) also stated that transferability is a student's ability to use what he has learned to solve new problems and to answer new questions.

The students' memory and transfer ability are the basic abilities that are used by the students to understand what is obtained during the learning process. The learning process aims to change the behavior of students as stated in the purpose of education. According to Anderson & Krathwohl (2001: 64), the purpose of education is described into six categories of processes, namely: memorizing; Understanding, applying, analyzing, evaluating, and creating. Categories of process memorizing are a process that is closely related to the memory process. The other five process categories are more related to the transfer process, they are the process categories in understanding, applying, analyzing, evaluating and creating.

The purpose of education in this field has not been fully achieved. Several studies reveal the problem of high level of student error and unequal composition aspects of the problem. The results of Yunengsih's research (2008) stated that the mapping of the national exam on cognitive aspect was not evenly distributed with the details of 68% of the basic competencies tested on the aspects of performance procedures, 22% aspects of memorize, 10% demonstrate understanding, while the conjecture/generalize/prove And solve non-routine problems have not been achieved at all.

## **RESEARCH METHODS**

### **Types of research**

This research is using descriptive analytic method with qualitative approach. The variables in this study are the level of cognitive process dimension of science questions in the handbook of fifth grade of elementary school students in Curriculum 2013. The dimensions of cognitive process can be presented in Table 1 below.

Table 1  
Cognitive Process Dimensions

No.	Taksonomi Bloom's level	Aspect
1.	<b>Remember/Memorize</b> Retrieving relevant knowledge from long-term memory	1.1 Recognizing 1.2 Recalling
2.	<b>Understand</b> Determining the meaning of instructional messages, including oral and graphic communication	2.1 Interpreting 2.2 Exemplifying 2.3 Classifying 2.4 Summarizing 2.5 Inferring 2.6 Comparing 2.7 Explaining
3.	<b>Apply</b> Carrying out or using a procedure in a given situation	3.1 Executing 3.2 Implementing
4.	<b>Analyze</b> Breaking material into constituent parts and detecting how the parts relate to one another and to an overall structure or purpose	4.1 Differentiating 4.2 Organizing 4.3 Attributing
5.	<b>Evaluate</b> Making judgment based on criteria and standards	5.1 Checking 5.2 Critiquing
6.	<b>Create</b> Putting elements together to form a novel, coherent whole or make an original product	6.1 Generating 6.2 Planning 6.3 Producing

Source: Amer (2006: 221)

#### Time and Place of Research

The study was conducted in February to July 2017. The location of this research was conducted in Sukabumi City. Associated with population and sample in this research use saturated sample technique. This technique is used by researchers because the science problems contained in the student handbook Curriculum 2013 are all become sampled.

#### Research subject

The subjects of the study are science questions in the handbook of the fifth grade of elementary school students in Curriculum 2013.

#### Data Collection Techniques and Instruments

Data collection techniques used in this study is questionnaire. The data collection instrument is a document analysis questionnaire with a rubric to examine each item. The instrument contains information on item number, problem statement, and type of cognitive process dimension.

#### Data analysis technique

Data analysis techniques in this study using two methods, namely: quantitative analysis and qualitative analysis. Quantitative analysis to calculate percentage level of cognitive process dimension of science examination questions in Curriculum 2013 students handbook. The quantitative steps analysis is done as follows.



(1) Calculate the level of knowledge dimension and cognitive process dimension about the Competency Test of Science in the Curriculum 2013 student handbook with Equation 1 (Ngalim, 2002: 102).

$$P = (\Sigma X) / n \times 100\% \dots\dots\dots \text{(Equation 1)}$$

Description: P = Problem level (%)  
 $\Sigma X$  = Number of cognitive levels  
 N = Total number of questions

(2) Convert the quantitative value to qualitative according to Table 2.

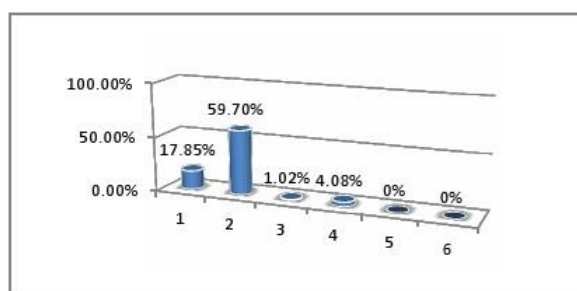
Table 2.  
 Convert Percentage To Category

No.	Percentage (%)	Category
7.	$\geq 80$	Very Good
8.	> 60-80	Good
9.	> 40-60	Enough
10.	> 20-40	Less

## RESULTS AND DISCUSSION

This research succeeded in collecting data related to the cognitive process dimension of science examination questions in fifth grade elementary school which is contained in the 2013 curriculum student handbook.

Table 3  
 Percentage of examination questions in fifth grade elementary school which is contained in the 2013 curriculum student handbook



Information:  
 1. Memorizing  
 2. Understanding  
 3. Applying  
 4. Analyzing  
 5. Evaluating and  
 6. Creating

Based on the table above, it can be analyzed as follows:

- Memorizing is retrieving information stored in long-term memory. Given is the lowest level of cognitive processes. To condition "memorizing" to be part of meaningful learning, the task of memorizing should always be linked to a wider aspect of knowledge and not as a loose and isolated one. This category includes two kinds of cognitive processes: recognizing and recalling. In the fifth grade handbook there are 35 questions (17,85%) which includes the ability to memorize and fall into the category less. Memory example is:
  - Mention the respiratory organs and their functions.
  - Notice the words in the above reading. Then, write down the name of the human organs contained in the reading along with its function.
- Understanding is to construct meaning or understanding based on the initial knowledge possessed, linking new information with existing knowledge, or integrating new knowledge into the existing scheme in students' thinking. Since the schema is a concept, conceptual knowledge is the



- basis of understanding. The categories of understanding include seven cognitive processes: interpreting, exemplifying, Classifying, summarizing, drawing inferring, comparing, and explaining. In the handbook of students in the fifth grade, there are 117 questions (59.70%) problems that include the ability to understand and fall into the category enough. Memory example is:
- a. Does the soap change to foam be called a change in the form of an object?
  - b. Why landslides can occur?
  - c. Has your digestion ever been disturbed? How to handle it?
3. Applying is to include the use of a procedure to solve a problem or perform a task. Therefore applies is close to procedural knowledge. This does not mean, however, that this category is only suitable for procedural knowledge. This category includes two kinds of cognitive processes: executing and implementing. In the fifth grade's handbook, there are 2 questions (1.02%) questions that include the ability to understand and fall into the category less. Memory example is:
- a. Practice a parallel series!
4. Analyzing is to describe a problem or object to its element and determine how the interrelations between these elements and the structure of magnitude. There are three kinds of cognitive processes in analyzing: differentiating, organizing, and finding the attributes. In the fifth grade handbook, there are 8 questions (4.08%) questions that include the ability to understand and fall into the category less. Memory example is:
- a. From the text "Acid Rain" create a mind map titled source and effect of garbage for people and the environment.
5. Evaluating is to make a consideration based on existing criteria and standards. There are two kinds of cognitive processes covered in this category: checking and critiquing. In the fifth grade handbook there is no problem was found in the evaluating ability.
6. Creating is combining some elements into a unified form. There are three kinds of cognitive processes that fall into this category, namely: generating, planning, and producing. In the fifth grade handbook, it is not found the problem that is on the ability to create.

## CONCLUSION

The result of mapping the science examination questions of the cognitive process dimension shows the quality of the science examination questions in the comprehension dimension as the most used type that is equal to 59.70%, followed by the recall ability of 17.85%, the ability to analyze 4.08%, and the ability to apply 1.02%. This is one of the shortcomings, because the problem has not been found in the ability to evaluating and creating.

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