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Analysys of Exam Questions Instrument Based on High Order Thinking Concept in Elementary Schools

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Abstract
Elemetary schools partner in Indonesia called Sekolah Dasar Mitra here in after referred as SDM are elementary schools which is having partnership with Primary Teacher Education study programs of Chatolic Musi Charitas University. The SDM should be choosen carefully. We should makesure they are implementing Kurikulum 2013 as well, included in the learning assessment process. The aim of this is to makesure the outcome of this study programme according to needed of employment in this era. This research using qualitative method. The analysis carried out on the structure of question of exam of SDM with High Order Thinking Skills (HOTS) criteria. The sample taking by random sampling method. The result showed 40 questions included on HOTS criteria dan 11 questions not included on HOTS criteria. HOTS question is about 78% dan other about 22%.

Keywords:
Analysis, Questions, Exam, HOTS

INTRODUCTION

Assessment process is important part of learning process. Permendikbud No. 23 Tahun 2016 explained about the taxonomy of thinking that can be reference to a clear assessment process. Beside that can guide the measurement process. Brookhart (2010:3-7) said that HOTS concept should show the core and aim of the learning process. Bloom's taxonomy which is revised by Anderson and Krathwohl shows six levels of thinking, that is C1=remembering, C2=understanding, C3=appliying, C4=analyzing, C5=evaluating and C6=creating. This level is separated by Low Order Thinking Skills (LOTS) which include C1 to C3 and High Order Thinkin Skills (HOTS) which include C4 to C6. Some of them include Middle Order Thinking Skills (MOTS) which include C3 and C4. HOTS is ability to critically make decisions and be creative in solving problems.

Dinni (2018:171) said that HOTS are ability to connecting, manipulating and modifiying also experience to critical thinking and solving problem. Ramadhan et all. (2018:86) states that the 2013 Curriculum emphasizez the information of students' mindsets, especially critical thinkin in particular and high-order thinking in general. High-order thinking skills very important in analyzing the problems faced by students in their daily life. According to Sani (2019:2) high order thinking skills includes critical, logical, reflective, metakocnitive and creative thinking skills. HOTS concept I sdesigned to improve studetns' thingking skills at higher level, especially those relates to problem solving skills in everyday life. Think critically in making choices and decisions wisely. Sani aads that HOTS concept will develop if the individual faces an unfamiliar problems, a challenging question or faces an uncertainty or dilemma.

Tomei further explained in Sani (2019:2-3) that HOTS concept includes the transformation of information and ideas. This transformation occurs when students analyze, synthesize or combine facts and ideas, generalize, explain or arrive at conclusions. According to Dinni (2018:170) HOTS concept is the ability to connect, manipulate, and change existing knowledge and experience critically and creatively in making decisions to solve problems in

new situations. Added by Saputra (2016:91) in Dinni (2018:171), high-order thinking skills is a thinking process at a higher cognitive level and is developed from various cognitive concepts and methods anf taxonomies of learning, such as problem solving methde. Students are trained to solve different problems at different levels. The complexity of the problems that may arise in the problem is in accordance with daily life (contextual).

Primary Teacher Education study programs of Chatolic Musi Charitas University aims to produce primay teacher. (PG DIKDAS. Direktorat Guru dan Tenaga Kependidikan Dasar, 2020) states that the role of professional teachers in learning is very important as the key to success of students and producing quality graduates. That's means the students of Primary Teacher Education study programs of Chatolic Musi Charitas University should follow the development of science including the concept HOTS as assessment term. One of the way made to improve student's abilities in mastering HOTS concept is through practical courses. However, in implementing practical courses in elementary schools, it is necessary to ensure that the primary schools used have implemented the HOTS concept in learning activities. For this reason, Primary Teacher Education study programs of Chatolic Musi Charitas University selects elementary schools with predetermines standards and establishes partnership.

Elementary schools partner in Indonesia called Sekolah Dasar Mitra here in after referred as SDM are elementary schools which is having partnership with Primary Teacher Education study programs of Chatolic Musi Charitas University. The SDM should be chosen carefully. We should make sure they are implementing Curriculum 2013 as well, included in the learning assessment process. They should did HOTS assessment instrument. According to the observation of some student practical report of assessment instrument, researcher found that some of assessment instrument not referring yet to HOTS criteria. So researcher planned to do deep observation to find out if SDM already implementing assessment instrument based on HOTS criteria. Researchers investigate assessment instruments used by SDM in academic years 2021/2022.

METHOD

This research using qualitative methods. This research analyzes the structure of questions of the SDM exam with HOTS criteria. Population of this research are elementary schools that have partnership with Pendidikan Guru Sekolah Dasar Study Program which amounts to six elementary schools. Sample of this research taken by random sampling method. The first, sampling randomly from six elementary schools. The second, from the selected elementary schools we selected randomly for class. The third, from the selected class we selected the subject randomly.

Data colleted by the following steps. 1) Collecting documents related to research including: theories related to HOTS concept and its implementation, and odd semester exam questions for the 2021/2022 academic year from SDM that have given permission. 2) Create an instrument containing the criteria for the analysis of questions based on the HOTS theory and then validated by the expert. 3) analyze the ood semester exam questions for the 2021/2022 academic year based on instruments that have been validates by experts. The statemets on the research instrument can be seen in the following table.

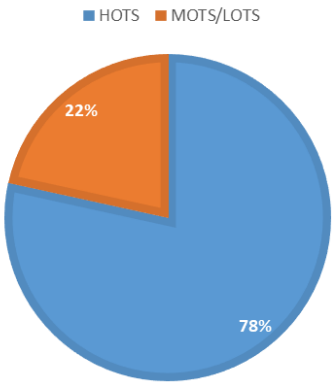
Table: I Research Instrument

No	Aspect	Statement
1	HOTS (C4-C6)	Question require students to do analysis
2		Question require students to do reflect
3		Question require students to do create works
4		Question require students to communicate
5		Question amphasize to discover
6		Question amphasize to creation
7		Question amphasize to design
8		Question is the application of the concept of knowledge in real life
9	Structure	The questions structure uses illustration in form of text, image, graph, scenario or table
10		The questions structure uses effective sentences
11		Question is clear
12		Question using appropriate punctuation
13		Question is at the level of analyze
14		Question is at the level of evaluate
15		Question is at the level of creative thinking
16		Homogeneous answer choices

According to Bogdan & Biklen in Anggito & Setiawan (2018:183) data analysis is an effort made by working with data, oraganizing data, selecting and sorting it into manageable units, synthesizing it, looking for and finding patterns, finding what is needed. Important and whar to learn, and decide what to tell other. The procedure of this research is as follows according to data processing technique by Miles and Huberman in Sugiyono (2018:213). 1) collect the required document; 2) do analyze; 3) draw tentative conclusions; 4) do a reassessment of the conclusion; 5) draw the second conclusion; 5) do a reassessment of the second conclusion; and 6) if all the data are complete, we can make a final conclusion. After gaining an understanding of final conclusions we can continue on the data processing technique. The validity of research data uses data triangulation where the researcher collects as many sources of data/information as possible. Sugiyono states that this process is include in steps 5 and 6 of the data processing section according to Miles and Huberman.

RESULTS AND DISCUSSION

Based on observation found. Sum of questions that meets with HOTS criteria about 40 questions. Sum of questions that do not meets with HOTS criteria about 11 questions. Ratio of HOTS questions and not HOTS shown as follows.



Ratio of HOTS and MOTS/LOTS

Then, based on investigation found 33 questions that are HOTS and have a good structure. the 7 questions are HOTS but not have a good structure. 10 questions not HOTS but have a good structure. 1 question not HOTS and not have a good structure. Ratio of the questions shown by Figure 2.

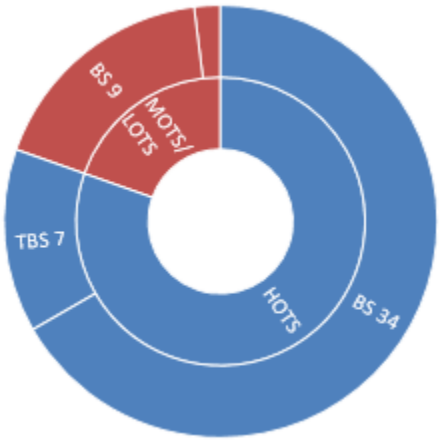


Figure 1. Distribution of Questions

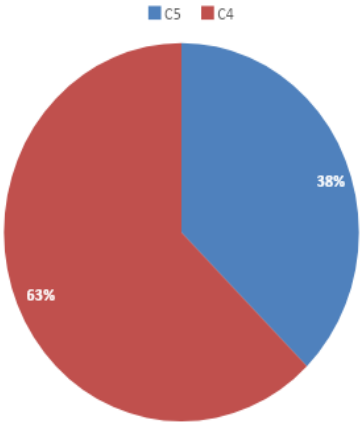


Figure 1. Ratio of C5 and C4 questions.

Then, based on the deep investigation of the 33 questions that HOTS and have a good structure found 14 questions are including on C5 thinking levels and 19 questions are including on C4 thinking levels by Bloom taxonomy. C5 questions are about 42,4% of the whole question. C4 questions are about 57,6% ot the whole. The percentage show by Figure 3.

Based on the Rule of Directorat General of Teachers and Education Personnel. Ministry of Education and Culture (2019, 37-38) conclude that HOTS are logical, critical creative and problem solving skills independently. Brookhart (2010) said tahat HOTS concept should explained clearly or imply core and learning objectives on class. Definition of HOTS can be classified on three category: 1) higher-order thinking skills in transfer concepts, 2) higher order thinking skills in critical thinking concepts, and 3) higher-order thinking skills in problem solving concepts. Although using an assessment with HOTS concepts, teacher should still paying attention to the principles of assessment of learning outcomes which

include; 1) Valid, the assessment should measure the achievement of the competencies specified in the content standads and graduate competency standards. 2) Objective, the assessment is based on clear procedures and criteria without being influenced by the subjective of the rater. 3) Fair, assessment is not beneficial or detrimental to students because of special needs and other factors that are not relevant in the assessment. 4) Integrated, assessment is an inseparable component of learning activities. The result of the assessment are used as the basis for imporving the learning process held. 5) Open, assessment procedure, assessment criteria and the basis for making decision on student learning outcomes can be known by all interested parties. 6) Continuous, assessment covers all aspects of competence by using various appropriate assessment techniques to monitor student development. 7) Systematic, the assessment is carried put in a planned and gradual manner by following standard steps. 8) Referring to the criteria, the assessment is based on the measure of achievement of the specified competence. 9) Meaningful, the assessment is easy to understand, meaningful, useful and dan be followed up by all interested parties, and 10) Accountable, assessment can be accounted for, for both in terms of techniques, procedures and result (sriyanti 2009).

The Rule of Directorat General of Teachers and Education Personnel. Ministry of Education and Culture (2019:39) states that the questions include in the HOTS concept have the following characteristic. 1) Transfer of the one concept to another. 2) Process and apply information. 3) Looking for links from different kinds of information. 4) Use information to solve problems. 5) Critically examine ideas and information. According to The HOTS Question Writing Guide Book (2019:6-7) the principle of writing HOTS questions includes the following three things. 1) Using a stimulus in the form of text, pictures, scenarios, table, graphics, discourse, dialogue, videos, or problems. 2) Using a new context in the form of material or problems formulation. This is intended as a reference for student alaysis. The context used should be related to the general knowledges of students so that students' ability to answer is no longer just a process of remembering. 3) Differentiate the level of difficulty and complexity of the thinking process.

In addition to the characteristics already mentioned, there are characteristics of HOTS assessment instrument as follows. 1) Measuring higher order thinking skills The Australian Council for Education (ACER) states that HOTS is a process: analyzing, reflecting, providing arguments (reasons), applying concepts to different situations, compiling, creating. 2) Divergent. Divergent in nature the HOTS assessment instruments allowa students to give different answers according to their thingking process and point of view. This is related to higher order thiking skills which include analytical, critical and creative thinking processes. Then the assessment is designed in the format of an open-ended task or question. 3) Using multiple representations HOTS requires students to explore implied information. In addition, students are also expected to be critical in selecting and sorting the required information. In order to achieve this, the HOTS assessment instrument should use various representations such as verbal (sentences), visual (pictures, charts, graphs, tables, including videos), symbolic (symbol, icons, initials, signs), and mathematical (numbers, formula, equation). 4) Based on contextual problems. HOTS questons are question based on real situations in the daily lifves of students. It is expected that students dan apply learning concepts in class to solve problems in their daily lives. Contextual questions have the following characteristics, which are abbreviated as REACT (Relating, Experiencing, Applying, Commuicating, and Transferring). 5) Using various forms of questions, such as in PISA, aim to provide more detailed and comprehensive information about the tes takers' abilities.

The various forms of questions, such as in PISA, aim to provide mode detailed and comprehensive information about the tes takers' abilities. Brookhart (2010:17-18) states that preparing a HOTS assessment plan must always pay attention to the basic principles of assessment. Suryadi (2020:84-87) states that in order for the assessment to meet the objectives and functions, the following principles need to be considered: 1) competency referenced, it means that the assessment is structured and designed to measure the mastery of students' abilities according to the targets thar have been set; 2) continuous, meaning that the assessment carried out by the teacher is the continuous process in a series of teaching plans for one semester and academic year; 3) Didactic, meaning that the assessments used must be designed in terms of content, format, and layout and appearance so that students enjoy and like the assessment activities; 4) exploring information, meaning that the assessment must be able to provide sufficient information for teachers to make decisions and provide feedback; 5) seeing right and wrong, it means that the teacher conducts a follow-up analysis of the result of the assessment and student work carefully to find common mistakes that occur in students as well as see the positive things that students give.

According to Nababan (2019) the questions must meet in terms of material, construct and language. Questions that meet in terms of material are the suitability of questions with indicators. In addition, there are distractors and questions (multiple choice must have one correct answer. Problems that meet in terms of construction include the following. 1)The questions is clear and firm. 2) The formulation of questions and answer choices does not use long-wided statements. 3) The formulation of the questions does not give a clues to the correct answer. 4) The question formulation does not contain double negative statements. 5) Homogeneous answer choice. 6) The length of the choice formulation must be relatively the same. 7) Does not contain answer choices "all the choices is right" or "all the choices is wrong". 8) The order of answers in the form of numbers is arranged from the smallest order. 9) Pictures, graphs, tables, diagrams, discourses and the like contained in the questions must be clear and functional, legible and easy to understand. 10) The formulation of the question does not use the word preferably, generally, or sometimes. 11) The question does not depend on the answer to the previous question. The last, questions that meet the language criteria are questions that use language that is accordance with the rules of the Indonesian language. The language used is communicative and does not repeat words that are not a nufied understanding.

From 51 selected questions that analyze with the instrument based on HOTS criteria. Item analysis based on C4-C6 category on Bloom taxonomy. C4 levels refers to ability of analyzing. C5 levels refers to ability of evaluating. C6 levels refers to ability of creating. Beside that, analysis done to the questions structure as requirements of a good questions. this is can not be obey because of HOTS question should satisfy a good question criteria. Even though in this research, the structure of questions meant set boundaries on there or not there is illustration, effectiveness of sentences, clarity of question sentences and punctuation.

Based on the findings discovered that 40 questions meets the HOTS criteria, 11 questions not meets the criteria. Moreover, based on HOTS criteria and structure found. 34 questions are meets HOTS criteria and have a good sturcture.7 questions meets HOTS criteria but not have a good structure. 9 questions is not meets HOTS criteria buat have a good structure. 1 qestions is not meets HOTS criteria and not have a good stucture.

Sample of HOTS and good structure question is questions number 37. Question number 37 is as follows.

4. Perhatikan gambar berikut.

Sikap yang harus dilakukan jika melihat keadaan pada gambar di atas adalah . . . . .

A. menyuruh orang lain untuk membersihkannya
B. menegur petugas piket agar membersihkannya
C. mengajak teman-teman untuk membersihkannya
D. membiarkannya saja karena itu tanggung jawab petugas piket

Figure 2. Questions Number 37.

Question number 37 used picture as illustration. Based on Buku Panduan Penulisan Soal HOTS (2019) fundamental of writing HOTS questions should stimulate by texts, picture, scenario, table, chart, discourse, video or problems. Saputra (2016) on Dinni (2018) said that higher order thinking is thinking process of complex problems which may there in the daily life (contextual). So, can be deduce that questions number 37 is a questions that meets with HOTS criteria. Questions number 37 refer to real life of students. Structurally, questions using a clear sentences and easy to understand. Based on Nababan (2019), a good question refer to in therms of structure that is clear and on point. Easy to understand and brief. So, questions number 37 can be categorize on a good structure questions. Finally, question number 37 can be categorize as HOTS questions and have a goos structure.
Sample of HOTS but not have a good structure question is questions number 4. Question number 4 is as follows.

4. $\frac{2}{8} \ldots \frac{5}{8}$

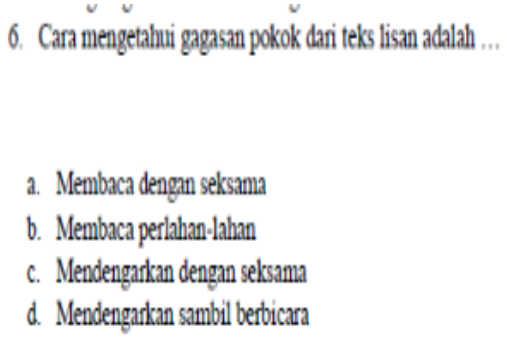
Tanda perbandingan yang tepat untuk melengkapi titik-titik diatas adalah …
a. $<$
b. $\geq$
c. $>$
d. $=$

Figure 3. Question Number

Question number 4 stimulate students to do analyze for the answers. Based on levels of Blooms taxonomy, analyzing include on C4 levels of thinking. this questions stimulate the students to critically thinking. Based on Sani (2019), HOTS questions covers the skills of logical thinking. On the question number 4, the student expected analyzing logically which right from sign of comparison in mathematic sentences on number 4. This sentences also consist of clear illustration. Based on the Panduan Penulisan Soal HOTS (2017), illustration of questions not only picture but also representation of symbols include symbols, icon, initial, and cue. So, question number 4 can be categorized as HOTS questions.

But, the sentences of questions is not effective. The first sentences of questions shown part of need to fill by the mathematics sign. So, the second sentences is the repetition of the first sentence. "*Tanda perbandingan yang tepat untuk melengkapi titik-titik diatas adalah…"* better change with "*Tentukanlah tanda perbandingan yang tepat untuk kalimat matematika berikut."* Nababan (2019) said that the questions which have a good structure have a straight sentences. Question number 4 uncategorized on the good question of structure. So, can be conclude that question number 4 meets the HOTS criteria but not have a good structure.

Sample of not HOTS but have a good structure question is questions number 24. Question number 24 is as follows.


6. Cara mengetahui gagasan pokok dari teks lisan adalah …

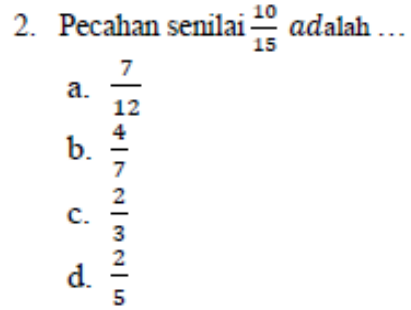
a. Membaca dengan seksama
b. Membaca perlahan-lahan
c. Mendengarkan dengan seksama
d. Mendengarkan sambil berbicara

Figure 4. Question Number

Question number 24 not focused on analyzing, evaluating and creating skills. This questions is conceptual and recitation about steps to known as main idea. While, Direktorat Jenderal Guru dan Tenaga Kependidikan. Kementerian Pendidikan dan Kebudayaan (2019), HOTS questions is a transfer of one to another concept. Besides that as a implementing process of information that can aim the students to critical thinking and logic. Based on the Panduan Penyusunan Soal HOTS (2019), HOTS questions used the stimulus have shape of text, picture, scenario, table, chart, discourse, dialogue, video, or problems. Question number 24 not using an illustration. So, the question is not meets with HOTS criteria.

Based on Nababan (2019), a good structure questions have 1) a clear and straight sentences; 2) the question formula does not give a clues to the answer; 3) homogeneous answer; and 4) the length of choice sentences must be relatively same. Question number 24 not meets this criterion. The questions using an effective sentence and right punctuation. The sentences have a clear meaning and easy to understand. So, can be deduce that question number 4 is not HOTS but have a good structure.

Sample of not HOTS and not have a good structure question is questions number 24. Question number 24 is as follows.


2. Pecahan senilai $\frac{10}{15}$ *ad*alah …

a. $\frac{7}{12}$
b. $\frac{4}{7}$
c. $\frac{2}{3}$
d. $\frac{2}{5}$

Figure 5. Question Number

Question number 2 is concept implementation of fraction without do not need deep analyze. This question is about understanding and implementation of shape on different questions. So, there is no more problem to solve. Student only need to memorize concept how to solve the fraction matters and implemented to different number. Question number 2 there on the C2 levels in Bloom taxonomy. Based on Saputra (2016) in Dinni (2018) higher order thinking skills is a critical thinking process to a complex problems that may be appear in the daily life. So, question number 2 can not be categorize as HOTS questions.

Based on Nababan (2019), a good questions giving a homogenous answer and consecutive from the smallest value to the higher. Question number 2 hane non-homogenous answer and not censecutive. Moreover, Nababan explained that the formula of question should clear and decisive. The question formula and the answer should not long-winded. On the sentences of question number 2 and illustration combined in one sentence. The question "*pecahan senilai"* better be *"pecahan yang senilai dengan…."*. So, Question number 2 categorize on not HOTS and not have a good structure.

Moreover, deep investigation of 34 questions that meet HOTS criteria and have a good structure refers to levels of thinking according to Bloom Taxonomy. 14 questions include to C5 levels about 37%. Question of C5 levels consist of questions number 3, 9, 16, 20, 21, 23, 28, 34, 36, 37, 38, 45, 48, dan 51.

Sample of C5 levels questions is question number 34. Question number 34 have clear scenario illustration. This question contextually using the daily incident as a sample. But the answer requires students to think critically. The students should made their own decision. Questions number 34 is as follows.

1. Salah satu bentuk kerja sama adalah diskusi. Diskusi merupakan pertemuan beberapa orang untuk bertukar pendapat. Akan tetapi, jika dalam berdiskusi kita menemukan perbedaan pendapat, kita harus . . . . .

A. mencela C. mengabaikan
B. menasehati D. menghormati

Figure 6. Question Number.

The rest, as much as 20 questions are C4 levels questions about 63%. The questions that include of this part are question number 5, 6, 7, 8, 10, 11, 13, 14, 15, 17, 18, 35, 39, 40, 41, 42, 43, 44, and 46. Sample of C4 levels question is question number 46. questons number 46 is as follows.

1. Perhatikan gambar berikut!

Berdasarkan gambar ilustrasi tersebut, judul cerita yang cocok adalah ...
a. Kelinci dan Siput
b. Keberuntungan Kancil
c. Si Kancil dan Buaya
d. Buaya Kecil

Figure 7. Question Number

Ratio of C5 levels questions and C4 levels are 37% compared to 63%. The comparison can be seen on Figure 3.

CONCLUSION

Based of discussion we can conclude. 40 question include HOTS question. The percentage about 78%. 11 question not include HOTS question the percentage about 22%. Which is means the SDM implementing HOTS about 78%.

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