ANALYSIS OF READING COMPREHENSION QUESTIONS BY USING REVISED BLOOM’S TAXONOMY ON HIGHER ORDER THINKING SKILL (HOTS)

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Abstract

The objective of this research was to investigate the three up levels of cognitive domain of revised Bloom’s Taxonomy used in the textbook entitled Bahasa Inggris SMA/MA/SMK/MAK grade 11 th semester 1, namely analyzing level (C4), evaluating level (C5), and creating level (C6). Using the descriptive qualitative method and content analysis, this study examined the questions in the reading comprehension tasks only to determine to what extent the reading comprehension questions emphasize on Higher Order Thinking. This research focused on analyzing the Bahasa Inggris SMA/MA/SMK/MAK textbook grade 11 th semester 1 published by the Ministry of Education and Culture. The researcher collected and listed the questions in the reading comprehension tasks and then calculated the percentage and frequencies of each level of cognition in each separate book chapter and in all five combined book chapters. The results showed that the most dominant level in the textbook was higher order thinking skills (HOTS). It was 66.8 % of 100 % while it was 33.4 % for lower order thinking skills (LOTS). It indicated that this textbook concentrated more on higher –level thinking questions than lower level thinking.

Keywords: Textbook, higher order thinking skill (HOTS) and reading comprehension.
INTRODUCTION

According to revised curriculum 2013, students should be enhanced in 4 main integrated aspects in lesson plan, comprising character building, literacy, 4C (creative, critical thinking, communicative, and collaborative), and higher order thinking skill (HOTS). Higher order thinking skill is now being very crucial in education world. It emphasizes students to have the ability to analyze, evaluate, and create an idea related to problems faced at schools or in social lives. It should be improved by applying it in teaching learning process. Teachers play a crucial role to enhance their students’ higher order thinking skill. This skill is essential for all of subject matters. Teaching for higher order thinking is largely a matter of identifying and using these operations (analysing, evaluating, and creating) of thinking in the context of subject areas such as mathematics, science, language arts, and social sciences (Peterson, 1990). Language learners especially English learners are expected to have higher order thinking skills. It assists them to complete their tasks in reading comprehension test and open their mind toward the occurring issues in the world.

Since the Indonesian curriculum has been changed to be the Curriculum 2013, the government through Educational Quality Insurance Institution (LPMP) requires the teachers to assist students to emphasize their critical thinking. It includes analyzing, evaluating, and creating which is usually called HOT (Higher Order Thinking). The government expects that the students will be more critical and analytical in their thinking so they can solve the problems they face in their daily lives.

Furthermore, the policy of Directorate of High School (2015) states that students’ assessment developed by teachers are expected to encourage the students’ higher order thinking skills of, creativity, and build their self-reliance to solve problems.

Moreover, Linggasari (2015) reports that the Indonesian government through Education Minister decided to raise the analytical level test or higher order thinking question up to 10 percent for each year.

Higher order thinking skills is essential for all fields. Teaching for higher order thinking is largely a matter of identifying and using these operations of thinking in the context of subject areas such as mathematics, science, language arts, and social sciences (Peterson, 1990). Language learners especially English learners are expected to
have higher order thinking skills. It assists them to complete their tasks in reading comprehension test and open their mind toward the issues happened in the world.

Besides, in this current curriculum students are prepared to face some both internal and external challenges. According to Education and Culture Ministry, internal challenges fulfill eight standards of competencies and the development of Indonesian civilization especially human resources. Meanwhile, external challenges include globalization issues, information and technology development, social lives, adaptation ability, creative and critical thinking skills, pedagogical and knowledge development, and negative phenomenon surrounding the students, for example, drug abuse, student fights, plagiarism, and cheating in final examinations.

Because of these reasons, all parts of stakeholder in education need to improve students’ higher order thinking skills. One of the ways in improving higher order thinking skill is by applying it in teaching learning process. As we know that classroom activity consists of three main elements, namely teachers, students, and textbooks. In this process, a teacher as a facilitator has a big portion to encourage students to operate their HOTSs. Teachers are suggested to give some HOTS questions for students directly or they can choose some tasks or activities from textbooks which provide HOTS questions. It can be concluded that a textbook should present valuable supplies of tasks and activities for both teacher and students. Furthermore, a textbook should be able to assist a teacher in producing questions in HOTS level which develop students’ thinking.

In addition, a textbook can also be a guidance for teachers and students in educational process especially in learning language. Hutchinson and Tores (1994) believe that textbook is an almost universal element of ELT teaching. Meanwhile Sheldon (1988) states that textbooks symbolize “the visible heart of any ELT program” and they offer significant advantages for both students and teachers. In his view, students are inclined to trust published materials (textbooks) than home-produced photocopied teachers’ resources, which are regarded as less valid. The effects of using a particular textbook, therefore, depend not only on its promoted approaches, methods and its content, but also on the expectations of learners and general view of textbooks in the learners’ culture.

Moreover, using a textbook is considered helpful because most of the goals and aims have already been prepared in sets of practices
based on the needs of the students (Cunningsworth, 1995). A good textbook should provide a useful resource for the teachers as a course designer and students as the one who is learning English (Gak, 2011).

Textbook is really helpful for the teacher in preparing the lesson plan. Since many teachers use textbook as the source of any activities for students, they should be more selective in choosing textbook to students. Therefore, it is expected that English textbooks provide some exercises with HOTS questions.

An appropriate textbook which contains HOTS questions has an important role in encouraging students’ critical thinking. According to Assaly and Igbaria (2014), a textbook is an essential source which provides the framework for activities to develop students’ thinking, and contains activities; not only does it transmit knowledge and information, but it also promotes and encourages higher thinking processes.

The Ministry of Education and Culture claimed students’ textbooks are worthy to be used in teaching learning process. This has put textbooks as the main support for teachers in teaching learning process. To fulfill the need of students’ textbooks, the government supplies and distributes them to all the provinces in Indonesia. These books were designed according to the Curriculum 2013 and published by Education and Culture Ministry. They were produced in all subjects including English subject. In writing textbooks, there are some criteria which authors should consider, such as: its usefulness for the students as well as teachers, its writing accuracy, and its format which should be eye-catching and etc.

Authors of textbooks also should consider another criterion relating to HOTS, which addresses the skills of analyzing, evaluating, and creating in the activities inside textbooks in order to emphasize students’ HOTS. Saville (1982) suggests that content analysis in textbooks is objective and reliable. In fact, the researchers found some English textbooks still provide the activities in lower order thinking skill level (LOTS), for example the textbook entitled Bahasa Inggris for SMA/MA/SMK/MAK grade 10th. For this reason, the researcher needs to do an analysis on the textbook entitled Bahasa Inggris for SMA/MA/SMK/MAK Grade 11th. The analysis consists of limited questions requiring the students to use HOTS, especially in reading comprehension test. Since reading is one of the four English skills that should be mastered by language learners, the writer chooses this skill to be investigated. Through reading, students as language learners are able
to draw the meaning of words and get the information from a text (Schultz, 1982). This skill is necessary for students since it can enrich and update their knowledge. Reading comprehension tasks are commonly available in students’ textbooks. There are some types of questions which take into consideration the different cognitive levels among students.

The researchers investigated the extent to which the three up levels of revised Bloom’s taxonomy namely analyzing, evaluating, and creating level are applied in the textbook. Moreover, it was a consideration for the researchers to analyze this textbook in order to give positive suggestions to English language teachers in selecting an appropriate textbook and hopefully can be some good information for textbook publishers in developing a suitable textbook for students in this 21st century. The importance of using textbook brought the researchers to analyze one of the high school students’ textbooks.

LITERATURE REVIEW

A textbook plays an important role in teaching and learning. Although some of the teachers use textbooks as an additional material, textbooks help teachers in teaching learning process. It assists teachers to develop teaching materials and help students to learn easier. It also can improve student’s comprehension in the classroom. Almost all the learning processes are assisted by a textbook. A textbook usually provides appropriate ideas, readings, exercises, and activities related to the subject matter (Jobrack, 2012). It is one of the key components in language program. In some situations, it serves as the basis for language input for learners where they receive and practice the language in the classroom (Richards, 2010). In addition, Depdiknas (2004) defines a textbook as a set of compilation of teaching materials which are methodically arranged by the authors in order to follow the current curriculum. In the other words, a textbook is a set of teaching learning instructions which contains lessons, skills and coherent or continuity topics that are written or arranged by authors in order to follow the current curriculum that carry out teachers’ and students’ needs.

Bloom’s Taxonomy was created in 1956 under the leadership of educational psychologist Dr. Benyamin Bloom who was born in Pensylvania and earned doctorate in education from the University of Chicago in 1942. Taxonomy is another word for classification.
According to Pratiwi (2014) taxonomy means classification hierarchy over basic principles or rules. Bloom Taxonomy is a classification system of cognitive thinking skills developed by Bloom. It has been extremely influential in education for the past 50 years (Krathwohl, 2002). In the 1970s, Bloom taxonomy was used as a tool for objectives-based evaluation and as a model for designing items that measure low-level skills versus higher-level skills (Marzano & Kendall, 2007). The 1980s were the years that emphasized the teaching of higher level of thinking and the validity of Bloom’s Taxonomy was considered to be revised. In May 1984, the association for supervision and curriculum development (ASCD) recognized the problem of poor performance of students with higher-level thinking tasks (Marzano & Kendall, 2007). Unfortunately, the association collaboration did not produce a revision of Bloom’s Taxonomy.

Anderson, Krathwohl and some colleagues then published a revision of the Bloom’s taxonomy in 2001. The revision result named as Bloom’s revised taxonomy. The revised taxonomy improves the original by adding a two-dimensional framework, that is, cognitive process dimension and knowledge dimension. The cognitive dimension is very much like the Bloom’s original taxonomy. There are only few significant changes. One of the main changes is the uses of verbs which describe actions (Stanley & Moore, 2013). The other change is that the position of cognitive levels, evaluating (C5), comes before creating (C6). There are two points revised such as the following (Anderson & Krathwohl, 2001):

![Diagram of Bloom's Taxonomy](image-url)

<table>
<thead>
<tr>
<th>1956</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluation</td>
<td>Create</td>
</tr>
<tr>
<td>Synthesis</td>
<td>Evaluate</td>
</tr>
<tr>
<td>Analysis</td>
<td>Analyze</td>
</tr>
<tr>
<td>Application</td>
<td>Apply</td>
</tr>
<tr>
<td>Comprehension</td>
<td>Understand</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Remember</td>
</tr>
</tbody>
</table>

Noun to Verb Form
Basically, Bloom’s six major categories were changed from noun to verb forms. Anderson and Krathwohl (2001) define the Bloom’s new taxonomy as:

- **Remembering**: Retrieving, recognizing, and recalling relevant knowledge from long-term memory.
- **Understanding**: Constructing meaning from oral, written, and graphic messages through interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining.
- **Applying**: Carrying out or using a procedure through executing, or implementing.
- **Analyzing**: Breaking material into constituent parts, determining how the parts relate to one another and to an overall structure or purpose through differentiating, organizing, and attributing.
- **Evaluating**: Making judgements based on criteria and standards through checking and critiquing.
- **Creating**: Putting elements together to form a coherent or functional whole; reorganizing elements into a new pattern or structure through generating, planning, or producing.

From the cognitive domain of Bloom’s revised taxonomy above, three up levels are named higher order thinking skills (HOTS). HOTS is the process of thinking which involves cognitive domain and metacognitive. It includes analyzing, synthesizing, and evaluating. McDavitt (1999) says that “Higher Order Thinking Skills includes analysis, synthesis, and evaluation and require mastery of previous levels, such as applying routine rules to familiar or novel problems”. Students with HOTS take new information from the text and interrelates or rearranges it and then extends this information to achieve a purpose. According to Lopez and Whittington (2001) HOTS occurs when a person takes a new information and information stored in memory and interrelates and or rearranges and extends this information to achieve a purpose or find possible answers in perplexing situation. In this study, the researchers focused on reading comprehension tasks provided in the *Bahasa Inggris SMA/MA/SMK/MAK textbook grade 11 semester 1* published by the Ministry of Education and Culture. According to Oxford dictionary, reading is the action of a person who reads. While comprehension is the mind’s act or power of understanding. It means that our mind accumulates every information well and holistically. Reading comprehension is the process to get the
meaning from the text completely. In reading, our background knowledge also has an important role. Millrood (2011) states that reading is the process of cognitive and visual activity that has purpose to extract meaning from the written text and process the information with existing experiences. Reading comprehension is not just reading the written text, but it involves cognitive and metacognitive process in order to get the target messages from the text. It is about more than simply understanding the words on the page, it also entails understanding the concepts and references made in the reading.

**RESEARCH METHODOLOGY**

The researchers used descriptive study to analyze the questions in *Bahasa Inggris for SMA/MA/SMK/MAK textbook grade 11*th based on Bloom’s revised taxonomy. Brown and Rodgers (2002) state that descriptive method is used in some research which describes an event or situation in numerical terms. They applied content analysis to identify questions in reading comprehension tasks. Content analysis is a simple research approach that is used to analyze books, documents, and etc. According to Rose, et al. (2015) content analysis is a flexible research approach that can be applied to a wide variety of text sources. It is used to classify parts of the text through the application of an arrangement and systematic scheme from which conclusions can be drawn. It can be used with either qualitative or quantitative data.

Cole (1988) says that content analysis is a method of analyzing written, verbal or visual communication messages to do deep analyzing toward an object. Moreover, it is used to identify the interpretation of texts, images, and other expressions (Krippendorff, 1980). The researchers adopted content analysis checklist from Pratiwi (2014) based on Bloom’s revised Taxonomy. The data was processed by using the percentage formula as recommended by Sudjana (2002, p. 43). Since the main source of the data of this research is English Textbook entitled *BAHASA INGGRIS for SMA/MA/SMK/MAK Grade XI Semester I*, the researchers focused the content analysis on all questions in reading comprehension tasks. Analysis was done by all researchers separately to prove reliability of the data. Inter-rater reliability is the extent to which the way information being collected in a consistent manner (Keyton, et al., 2004). The validity of the data was reached when the reliability agreement is more than 80 %. Keyton, et al. (2004) state that computing inter-rater reliability is a relatively easy process.
involving a simple mathematical formula based on a complicated statistical proof.

**RESULTS AND DISCUSSIONS**

The results of this study are shown in Table 1 which shows the level of the frequency and the percentage in the six levels of the cognitive dimensions in each of the five chapters of the textbook.

**Table 1. Frequencies and Percentages of the Reading Activities in the Six Levels of Cognitive Dimensions**

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Level of Cognitive Dimensions</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C1</td>
<td>C2</td>
</tr>
<tr>
<td>I</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>45.4%</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>12.5%</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>12.5%</td>
<td>12.5%</td>
</tr>
<tr>
<td>IV</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>20%</td>
<td>40%</td>
</tr>
<tr>
<td>V</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Percentage</td>
<td>6.7%</td>
<td>22.2%</td>
</tr>
</tbody>
</table>

After categorizing reading comprehension questions in every chapter based on revised taxonomy bloom, the researchers found that the most dominant cognitive dimension was evaluating level (C5). The frequency of evaluation was 16 out of 45 questions and the percentage was 35.6%. The second rank was understanding level (C2) with the frequency of 10 out of 45, equal to 22.2%. The third levels were analyzing level (C4) and (C6). The frequencies of both items were the same; 7 of 45 or 15.6%. Remembering level (C3) was 3 of 45 with the
percentage of 6.7%. The last level was application level (C3) which occurred once with the percentage of 4.5%.

From the frequencies of cognitive domain above, it can be concluded that this book provides enough HOTS questions for the students. The HOTS percentages are described in the table below;

**Table 2. The Percentages of Cognitive Dimension Distribution in the BAHASA INGGRIS for SMA/MA/SMK/MAK Grade XI Semester I textbook**

<table>
<thead>
<tr>
<th>No.</th>
<th>Cognitive Dimension Level</th>
<th>Frequencies</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>LOTS Remembering</td>
<td>3</td>
<td>6.7%</td>
</tr>
<tr>
<td>2.</td>
<td>Understanding</td>
<td>10</td>
<td>22.2%</td>
</tr>
<tr>
<td>3.</td>
<td>Applying</td>
<td>2</td>
<td>4.5%</td>
</tr>
<tr>
<td>4.</td>
<td>HOTSTHinking Analyzing</td>
<td>7</td>
<td>15.6%</td>
</tr>
<tr>
<td>5.</td>
<td>HOTSTHinking Evaluating</td>
<td>16</td>
<td>35.6%</td>
</tr>
<tr>
<td>6.</td>
<td>HOTSTHinking Creating</td>
<td>7</td>
<td>15.6%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>45</td>
<td>100%</td>
</tr>
</tbody>
</table>

The table above shows that this English Textbook consists of high frequency of HOTS questions. It was 30 of 45 questions. The highest level applied was evaluation level (C5) which reached 35.6%, then followed by analyzing and creating level with the same percentages, which was 15.6% for each level.

**Discussions**

Based on the data analysis toward BAHASA INGGRIS for SMA/MA/SMK/MAK Grade XI Semester I textbook, the more dominant level of the cognitive domain of Bloom’s revised taxonomy used in the textbook is higher order thinking skills (HOTS) level than LOTS level. It can be seen from the analysis result table that 30 questions out of 45 reading comprehension questions were classified as HOTS level. The percentage was 66.8% of 100%. Besides, the researcher found only 15 questions or 33.4% categorized into LOTS).

From the three levels of HOTS cognitive domain, evaluating level (C5) was the most dominant level which appeared frequently with the percentage of 35.6%. It means this textbook encouraged the students to judge, compare or assesses some ideas in the reading comprehension text. From the percentages above, it implies that the writers of this textbook included enough HOTS questions and presented some materials which could generate and attract learners to use all their
mental processes optimally. The numbers of questions requiring high cognitive domain in all chapters of the textbook implies that the authors took that into consideration in stimulating the learners to use HOTS.

It means that this book prepared the students to think critically and make the solution of some problems according to the ideas in the text. A good textbook should be more emphasizing on HOTS. Freahat and Smadi (2014) studied that the reading content in high school textbooks has higher–level thinking questions than the reading material of university textbooks in Jordan.

The first research question is focused on analyzing level (C4). The question is “to what extent is analyzing level (C4) of Bloom’s revised taxonomy included in the reading comprehension tasks of English Textbook grade eleven?” Analyzing level (C4) ranked the second position of HOTs application in reading questions after evaluating level. Based on the findings above it can be concluded that 7 of 45 questions were classified as analyzing level (C4). The percentage was 15.6 % of 100 % (see in Table 2). Those questions (C4 questions) had a balanced distribution in the entire chapters. They separated in each chapter (see in Table 1).

This result showed that the textbook provides some questions which develop students’ higher thinking skills. These questions promote the students’ skills to distinguish, investigate, or analyze the questions according to the text given. According to Brookhart (2010) analysis level questions present students with materials (or ask them to locate materials), then ask questions or present problems whose answers require differentiating or organizing the parts in some reasonable manners. It means that analysis is the ability to break down material into its component parts in order to understand its organizational structure. This Analysis level involves identifying parts, analyzing the relationships between parts, and recognizing the organizational principles involved.

To answer research question number 2; “to what extent is evaluating level (C5) of Bloom’s revised taxonomy included in reading comprehension task of English Textbook (Student Book) grade eleven?” The researcher found that most of the questions in this book, 16 of 45 questions, were included into evaluation level (C5). The percentage was 35.6 %. It means that this book provided a high frequency of HOTS questions. However, the distribution of these levels of questions was not balanced with other HOTS questions. Evaluation level (C5) had more portion than the analyzing level (C4) and creating level (C6)
in the textbook, where the authors put 16 questions of evaluating level. Meanwhile analyzing level (C4) and creating level (C6) were only 7 questions.

From the percentage of evaluating level above, it can be implied that the writers of this book put the evaluation portion in the first level of cognitive domain. It is because the writers’ purpose was to develop level of thinking more on evaluating level as it involves the ability to judge the value of material for a given purpose, based on definite criteria determined by students or teachers. These criteria may be internal organizational criteria, or external criteria that are relevant to the objectives. The category of evaluation involves thinking processes from all the previous ones and is therefore the highest in the hierarchy of thinking processes. The results will draw attention to the details, increase comprehension and expand problem solving skills.

To answer the research question number 3: “To what extent is the creating level (C6) of Bloom’s revised taxonomy included in reading comprehension task of English Textbook (Student Book) grade eleven?” The result showed that 15.6 % of the reading comprehension tasks belonged to creating level (C6). The frequency was 7 of 45 questions and ranked in the second position as well. They were separated in every chapter. According to Brookhart (2010) creating means reorganizing existing things to make something new. Current students with a task to do or a problem to solve that include generating multiple solutions, planning a procedure to accomplish a particular goal, or producing a new thing. Students are asked to write, compile, or compose the paragraph or any ideas according to the idea of the reading comprehension text in creating level (C6).

This result of this study did not support the previous studies done by some researchers in some countries such as Igbaria (2013) Freahat and Smadi (2014) Zaiturrahmi (2017) and Tangsakul (2017). Their results revealed that the textbooks that they analyzed emphasized on LOTS questions. It was because the focus of their objectives and the textbook that they analyzed were different. This study results also showed that this textbook “BAHASA INGGRIS for SMA/MA/SMK/MAK Grade XI Semester I” represented the Indonesian stipulated curriculum. It means that this book has fulfilled the standard of an ideal book that the reading comprehension questions mostly emphasize on HOTS that stimulate the students to think analytically and critically.
CONCLUSIONS

Based on the findings, the researcher found the percentages of HOTS questions are more dominant than LOTS questions. It is 66.8% from entire questions. They are distributed evenly in each chapter. Besides, only 33.4% are categorized as LOTS questions.

After analyzing all the questions in all chapters in the textbook, the researchers can reveal the percentage of the reading comprehension questions emphasizing the tree up level of Bloom’s revised taxonomy, namely analyzing level, evaluating level, and creating level. Based on the findings, it reveals that most of these questions are emphasized on HOTS especially on evaluating level (C5) with the percentage of 35.6%. It means that the writers of the textbook expect the students of eleventh grade can think critically, creatively and logically.

Analyzing level (C4) and creating level (C6) ranked in the second position each which have similar number of questions and percentages. There are 7 questions for each or 15.6%. It means that this textbook provides adequate questions with these levels of questions.

Most of the questions in the reading comprehension task ask students to think more analytically and critically based on their own opinion. The questions need not only remembering or understanding but also analyzing, evaluating, and creating.

REFERENCES


