The Incorporation of High Order Thinking Skills in Exercises of the Eleventh Graders English Textbook

Jihan Fakhira  
*English Language Education Study Program*  
*Universitas Negeri Jakarta*  
*Jakarta, Indonesia*  
*jihanjhn1611@gmail.com*

Ifan Iskandar  
*English Language Education Study Program*  
*Universitas Negeri Jakarta*  
*Jakarta, Indonesia*  
*ifaniskandar@unj.ac.id*

**Abstract**

This study was qualitative research using content analysis that aimed to investigate to what extent high order thinking skills (HOTS) are incorporated in the reading exercises of English textbook for 11th graders and to describe how HOTS are incorporated in the reading exercises. This study used Bloom’s Revised Taxonomy (BRT) table and the table of description was used to examine 107 essay reading exercises that come after every reading passage in a textbook published by the Ministry of Education and Culture of Indonesia. The findings showed that (1) the HOTS in the reading questions were available in 50 questions (46.7%) while the LOTS were in 57 questions (53.3%). (2) The HOTS questions required students to analyze the storyline from the reading passage, to argue their opinion or judge if they like the reading text, to assess their own knowledge as their awareness were raised or changed toward the topic, and the last to create a new ending of the story. The findings of this research are expected to be the references for teachers to check the incorporation of HOTS in the exercises before they give to the students.

**Keywords:** Reading questions, Bloom’s Revised Taxonomy (BRT), Higher Order Thinking Skill (HOTS).

**INTRODUCTION**

There is no doubt that we are living in the world that undergoes rapid changes in all aspects of life, including in the education fields. Those rapid changes have consequences and demands on people’s life around the world that need to be anticipated by mastering the 21st century skills. According to Griffin, McGaw, and Care (2012), those skills are critical thinking and problem solving, creativity and innovations, communication, collaboration, metacognition, ICT literacy, citizenship, life and career, and personal and social responsibility. These skills are closely related to high order of thinking skills (HOTS) because incorporating HOTS in the learning process helps improve students’ ability in critical thinking skill to evaluate information and solve problems, as mentioned by Brookhart (2010). For senior high school students who will continue their study to higher education or want to go to work, having these skills is very important for preparing them to face the real-world problems and challenges by their own thinking.

Brookhart (2010) also defines HOTS into three terms: (1) *transfer*, (2) *critical thinking*, and (3) *problem solving*. In terms of transfer, HOTS require students to be able to relate their learning to other elements they have learnt before. This could prepare students into the real world where their own thinking is more considerate rather than a series of recall assignments. The second term is critical thinking. Brookhart argues that ‘being able to think’ means students can apply wise judgement or produce a reasoned critique. Moreover, wisdom
and judgment are important in HOT tasks such as judging the trusted sources. Last category is problem solving, which treats a problem as a goal that cannot be met only with a memorized solution. In other words, lower order thinking level which forces students to recall their knowledge may not help them in solving problems.

Thus, nowadays education around the world needs an improvement in the system to face the challenges of 21st Century and the improvement can be from the learning materials that students and teacher use in the classroom. There are plenty learning materials that can be used in language program, and textbook is the most commonly used sources in teaching language (Reed, Bergemann and Olson, 1998) because textbook provide a clear framework, guide the teacher and student what they should learn, and provide the learning tasks (Ur, 2009).

An appropriate textbook which contains HOT questions has an important role in encouraging students’ critical thinking. According to Assaly and Igbaria (as cited in Febrina et al, 2019), 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. Furthermore, it is expected that English textbooks provide some exercises with HOT questions because they encourage students to elaborate their discussion, encourage them to make a visual representation in their mind and connect their prior knowledge to what they have learnt (Cox, 2019). One of the aspects from the textbook that can be evaluated by teachers is the quality of the exercises or tasks. Exercises or tasks in a textbook play an important role for students because it will provide hands-on and direct experience to students in their process of acquiring knowledge and information (Sucipto and Septian, 2019). The exercises are also useful for teachers to know and measure students understanding on the topic and their ability or skill in English language (Pratiwi, 2014).

As one of the four basic language skills, what makes reading such a complex and difficult skill to learn is because it is a fluent process of readers combining information from a text and their own background knowledge to build meaning (Nunan, 2003). Linse (2006) also explains that reading involves HOTS and is much more complex than only decoding specific words. She also adds the essential part of reading process is how to derive meaning as well as analyze and synthesize what have been read. In this concern, teaching HOTS is necessary to develop students’ reading skill because students need to answer the reading questions at all levels of thinking to see their comprehension of the text. HOT questions could help students to evaluate information and solve the problem.

High order thinking skills have received much attention in the past years. For example, research conducted by Igbaria (2013). The aim of this study was to examine the variety of cognitive levels based on Bloom’s taxonomy represented by WH-questions in the Horizons textbook for ninth grade. Also, this study attempted to examine the extent to which the WH-questions in the textbook emphasized high-level thinking. The research tools that he used was a guide for the levels of questions based on the cognitive domain in Bloom’s taxonomy. The result showed that 244 questions emphasized on the lower order thinking skills, while only 137 questions emphasized on the top three level domains of Bloom’s taxonomy.

The latest research comes from Akbari (2019). The objective of this study was to analyze the HOTS based on Bloom’s Revised Taxonomy in the reading activities of Buku Sekolah Elektronik (BSE). To gather the data, the researcher used a table analysis of Bloom’s Revised Taxonomy adapted from Anderson and Krathwohl (2001). The findings of the data analysis showed that 78% of activities were on low order thinking level, while the rest of 22% activities were on high order thinking level. It means that the distribution of LOTS and HOTS in the reading activities were not equal.

Bloom’s Taxonomy has become one of the most well-known taxonomies in the educational field and has been revised and modified several times, one of which is the version by Anderson and Krathwohl (2001). Unlike the original version, this version is two-dimensional. It means, there are cognitive level dimension and knowledge dimension in this taxonomy. The cognitive level is in a form of verbs that represent students’ learning, while the type of knowledge is in a form of nouns that represent what students are to learn. The knowledge dimension of Bloom’s Revised Taxonomy contains four categories: factual, conceptual, procedural, and metacognitive, arranged from concrete (Factual) to abstract (Metacognitive).

<table>
<thead>
<tr>
<th>Concrete knowledge</th>
<th>Abstract knowledge</th>
</tr>
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</table>

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The cognitive level in the revised version includes six major categories: remember, understand, and apply which belong to LOTS, and analyze, evaluate, and create which belong to HOTS. It is noticeable that the categories start from simple ones moving up to more complex ones which imply that one cannot master the higher levels before mastering the lower ones.

<table>
<thead>
<tr>
<th>Factual Knowledge – Basic Information</th>
<th>Conceptual Knowledge – The relationships among pieces of a larger structure that make them function together</th>
<th>Procedural Knowledge – How to do something</th>
<th>Metacognitive Knowledge – knowledge of cognition in general as well as awareness and knowledge of one’s own cognition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge of terminology</td>
<td>Knowledge of classification and categories</td>
<td>Knowledge of subject-specific skills and algorithms</td>
<td>Strategic knowledge</td>
</tr>
<tr>
<td>Knowledge of specific details and elements</td>
<td>Knowledge of principles and generalizations</td>
<td>Knowledge of subject-specific techniques and methods</td>
<td>Knowledge about cognitive tasks, including appropriate contextual and conditional knowledge.</td>
</tr>
<tr>
<td></td>
<td>Knowledge of theories, models, and structures.</td>
<td>Knowledge of criteria for determining when to use appropriate procedures.</td>
<td>Self-knowledge.</td>
</tr>
</tbody>
</table>

(source: Anderson and Karthwohl, 2001:46)

The cognitive level in the revised version includes six major categories: remember, understand, and apply which belong to LOTS, and analyze, evaluate, and create which belong to HOTS. It is noticeable that the categories start from simple ones moving up to more complex ones which imply that one cannot master the higher levels before mastering the lower ones.

<table>
<thead>
<tr>
<th>Level</th>
<th>Related Verbs to the Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remember – Retrieving relevant knowledge from long-term memory (Recognizing and recalling)</td>
<td>choose, define, describe, find, identify, label, list, locate, match, name, recall, recite, recognize, record, relate, retrieve, say, select, show, sort, tell</td>
</tr>
<tr>
<td>Understand – Constructing meaning from instructional messages, including oral, written, and graphic communication. (Interpreting, exemplifying, classifying, summarizing, inferring, comparing, explaining).</td>
<td>categorize, clarify, classify, compare, conclude, construct, contrast, demonstrate, distinguish, explain, illustrate, interpret, match, paraphrase, predict, represent, reorganize, summarize, translate, understand</td>
</tr>
<tr>
<td>Apply – Carrying out or use a procedure in a given situation. (Executing, implementing)</td>
<td>apply, carry out, construct, develop, display, execute, illustrate, implement, model, solve, use</td>
</tr>
<tr>
<td>Analyse – Breaking material into parts and see how they related to one another and to an overall structure or purpose. (Differentiating, organizing, attributing).</td>
<td>analyse, ascertain, attribute, connect, deconstruct, determine, differentiate, discriminate, dissect, distinguish, divide, examine, experiment, focus, infer, inspect, integrate, investigate, organize, outline, reduce, solve (a problem),</td>
</tr>
<tr>
<td>Evaluate – Making judgments based on criteria and standards. (Checking, critiquing)</td>
<td>appraise, assess, award, check, conclude, convince, coordinate, criticize, critique, defend, detect, discriminate, evaluate, judge, justify, monitor, prioritize, rank, recommend, support, test, value</td>
</tr>
<tr>
<td>Create – Putting elements together to form coherent whole or make an original product. (Generating, planning, producing).</td>
<td>adapt, build, compose, construct, create, design, develop, elaborate, extend, formulate, generate, hypothesize, invent, make, modify, plan, produce, originate, refine, transform</td>
</tr>
</tbody>
</table>

(source: Anderson and Karthwohl, 2001:67)
HOTS are more than just memorizing, understanding, and applying facts because they require students to do something with the facts that they get and process the information. According to Thamrin and Widodo (2019) good readers need HOTS to think of, and direct their perception before, during, and after reading the passages. Cox (2019) proposed several strategies that can be used to enhance HOTS for students: (1) Lead students to connect what they have learnt with their prior knowledge to help them gain their understanding; (2) Encourage students to create a movie (visual representation) in their mind to understand the information in a powerful and unique way; (3) Use some questions that expand the discussion with elaboration or explanation of their thoughts in more detail; and (4) Teach QARs (Question-Answer Relationships) by giving students questions the answers of which are not explicitly stated in the text to make the students find a strategy to relate what they already know with the information from the text, and find how it fits together.

Considering the importance of HOTS as discussed above, the researcher was interested to investigate the incorporation of high order thinking skills in the reading exercises of an eleventh graders English textbook published by the Ministry of Education and Culture of Indonesia and how HOTS were incorporated into the reading exercises.

RESEARCH METHOD

This research employed qualitative method which used content analysis because this technique is suitable for making replicable and valid inferences from texts (printed matter, recorded speech, visual communications, works of art, artefacts) or other meaningful matter to the contexts of their use (Krippendorff, 2004). The collected data were 107 questions of reading exercises coming after the reading passages collected from the English textbook for eleventh graders published by the Ministry of Education and Culture of Indonesia. Two forms of instruments used to analyze the incorporation of HOTS in the questions: Bloom’s Revised Taxonomy table proposed by Krathwohl (2002) and a table of description adapted from Sari (2019). The table used to explain descriptively the questions was based on the Bloom’s Revised Taxonomy table which consisted of the list questions, the cognitive process each of questions and its description.

To carry out the research, several procedures and analysis was followed. First, the researcher selected the textbook which will be analyzed in this study. Then, the researcher collected and listed all the questions that come after every reading text. Next, the researcher used BRT table as reference to decide what kind of cognitive and knowledge dimension contained in each question. Go on with examining all the essay questions into the table of description. Lastly, the researcher employed a simple statistical calculation to determine the distribution of each level of the HOTS and interpreted the data qualitatively.

RESULTS AND DISCUSSION

A. Results

The diagram below illustrated the two big levels of The Bloom’s Revised Taxonomy (Anderson and Krathwohl, 2001): LOTS (53.3% with 57 reading questions) and HOTS (46.7% with 50 reading questions).
Detailed distribution of each dimension can be seen on the table below which showed that to some extent the book implemented all the six categories of the Bloom’s Cognitive Dimensions. The data which were taken from 8 chapters and 6 enrichment sections showed that the dominant category of cognitive process in BRT was “Evaluate” level with a total of 40 questions and with percentage of 37.4%. Evaluate level required students to make a judgment or value based on the criteria and standards (Anderson and Krathwohl, 2001). Most of the questions from this level required students to argue, judge, justify, assess, and appraise from their own opinion or some of specific information and details such as an event, personality of person, and the storyline from the reading passage that they had read before. Some of the sample questions from this level were “Whom do you agree with, Jane or Siti? Why?”; “Did this opinion article raise/change your awareness about bullying?”

<table>
<thead>
<tr>
<th>Knowledge Dimension</th>
<th>Cognitive Dimension</th>
<th>LOTS</th>
<th>HOTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factual</td>
<td>Remember</td>
<td>12.1%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>Understand</td>
<td>12.1%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>Apply</td>
<td>0%</td>
<td>4.7%</td>
</tr>
<tr>
<td></td>
<td>Analyse</td>
<td>0.9%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>Evaluate</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>Create</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>27.1%</td>
<td>21.5%</td>
</tr>
</tbody>
</table>

The second dominant category distributed in the reading questions was “Remember” level with 29 questions or 27.1%. According to Anderson and Krathwohl (2001), this cognitive level required students to recall and retrieve relevant knowledge from long-term memory. In this lower category, students were expected to describe, list, find, tell, and identify some specific information such as an event, person, terminology, and symbol from the reading passage or type of a reading text. The sample questions in this level were “What is happening between Siti and Jane?”; “What is global warming?”.

“Understand” level was in the third place with 23 questions or 21.5%. Understanding level required students to construct meaning from instructional messages that could be in written, oral or any graphic communication form (Anderson and Krathwohl, 2001). The questions in the exercise asked students to explain, conclude and illustrate the information that they had read from the previously given reading passage. Generally, the questions made students understand the context of the reading passage or implied the meaning of the text. Some of the sample questions from this level were “What do you think the title “Stand by Me” means?”; “What is the song "Hero" about?”.  

The next cognitive process was “Analyze” level which required students to break material into parts and see how each part is related to one another and to an overall structure or purpose (Anderson and Krathwohl, 2001). There were 6 questions or 5.6% in this level. Questions at this level required students to examine and analyze some of storyline from the text. The sample questions that required students to analyze were “Did the fisherman like asking the fish for wishes? How did he feel about it? Do you think he could have done something else instead of going back to the fish again and again?”. 

In the fifth place was “Apply” level with 5 questions or 4.7%. This cognitive level required students to carry out or use a procedure in some given situations (Anderson and Krathwohl, 2001). The questions of this level triggered students to imagine what they would do if they were in the character’s position or to solve some problems that they had been thinking of before. The sample question in this level was “If you were in Sue’s shoes, how would you have reacted to Johnys’s irrational thoughts?”. 

The category with the least occurrence was “Create” level with only 4 questions or 3.7%. Create was the highest level of cognitive dimension and this level required students to put elements together to form coherent whole or make an original product (Anderson and Krathwohl, 2001). All the questions in this level asked students to write a new ending of the story based on their own version or modify the lyrics that they want to change. The samples questions of this level were “If you had a chance to rewrite the story, how would the story end? Write your ending of the story”; “If you had to change the lyrics of "Stand by Me", which lyrics would you change?”. 

For the knowledge dimension, this textbook covered all four types of knowledge that were proposed in the Bloom’s Revised Taxonomy. The most dominant knowledge dimension used in this textbook was “Factual
knowledge” with 46 questions. The questions asked about the factual information, specific details of the story, and knowledge of terminology. One of the examples was “Invictus is a Latin word that means unconquered. What does it say about the poem?”. The next high-scored knowledge dimension was “Metacognitive knowledge” with 44 questions. The questions generally asked students to relate the questions with their own self-knowledge and conditional knowledge. The sample question was “Who is your hero? Why?”. “Conceptual knowledge” was in the third place with 14 questions which made students learn about the kinds or types of text. The sample question of this level of knowledge was “What kind of text is given above?”. Lastly, the least used knowledge dimension in this reading questions was “Procedural knowledge” with only 3 questions. This knowledge was related to the knowledge of performing skills, one of which samples was “What would you have done if you were in Mr. Behrman’s place?”. 

Some of the questions in HOTS level used several strategies to enhance HOTS. For example, the author used instruction when students need to elaborate or expand their answers (Cox, 2019), the examples of instruction were: “Give reasons to support your opinion”, “Support your opinion with examples”, “Discuss what you learn from the story”, “Discuss with your peers”. Several questions in this textbook were solved by requiring students to actively picture the action like one in the movies or imagine that they were in the character’s position in their mind. The examples were: “If you were in the Sue’s shoes, what would you…”, “Think of an example of task or event in your life that required your responsibility, were you…..”. In this way, HOTS strategy would truly help them understand the story and could solve the questions in a unique way (Cox, 2019). And last, the strategy used by the author was by providing questions, the answers of which were not on the reading text. Students needed to think about what they had already known and connected it to the information that they got from the text to answer the questions. It is known as Questions-Answer Relationships (Cox, 2019). The sample question of this strategy was “Have you witnessed bullying? Describe how you felt”.

To sum up, reading exercises in this English textbook had already incorporated high order thinking skills, even though the percentage was still less dominant than that of the LOTS. Most exercises still required students to think in the lower-order level.

B. Discussion

Based on the finding’s description above, there are several things that can be highlighted, and it will be arranged based on the findings of the research questions.

RQ 1: To what extent high order thinking skills are incorporated into the reading exercise of the eleventh graders English textbook published by Ministry of Education and Culture of the Republic of Indonesia?

Exercises in a textbook can give the best impact for effective teaching learning process because the exercises or activities in the textbook would provide hands-on experience to students in their process of acquiring knowledge and information with direct experience (Sucipto and Septian, 2019), and they were also useful for teachers to know and measure students’ understanding on the topic and their ability (Pratiwi, 2014).

The findings of the data analysis in reading questions of English textbook for eleventh graders showed that all cognitive process and all knowledge dimension of Bloom’s Revised Taxonomy were used in the textbook. The reading questions spread over all level cognitive process, starting from “Remember”, “Understand”, “Apply”, “Analyse”, “Evaluate”, up until “Create”. But out of the six cognitive levels, the most dominant level was the “Evaluate” level. And for the knowledge dimension, the reading questions include “Factual knowledge”, “Conceptual knowledge”, “Procedural knowledge” and “Metacognitive knowledge”. The most dominant knowledge dimension in this reading questions is “Factual knowledge” because the questions asked about factual information, specific details of the story, and knowledge of terminology. The result of the analysis of reading questions in English textbook for eleventh graders of senior high school based on Bloom’s Revised Taxonomy showed that the prevailing reading exercise in the textbook already promoted HOTS covering 46.7% of the total reading questions with the “Evaluate” level appeared most frequently in the questions. Yet, the total percentage was still lower than LOTS which covered 53.3%.

The questions that incorporated HOTS practice could improve students’ ability in critical thinking to evaluate information and solving problem as one of the skills required in the 21st century. The exercises on “evaluate” level required students to judge or argue their opinion about the text and assess their own knowledge while the “analyze” and “create” level required students to analyze the storyline and write something new.
based on their version. However, the data showed the exercises on the textbook frequently asked student to describe the specific information that they got from the reading passages or explain the information. Yet, LOTS were still needed in the exercises for checking students’ literacy comprehension, but it would be not enough to promote students’ critical thinking and problem-solving skills. Thus, the author of the textbook should add more questions that require students to use their level of thinking in analyzing and creating level to promote student’s HOTS.

This result was also in line with the findings of the research conducted by Atiullah, Fitriati, & Rukmini (2019) in which HOTS were less frequently represented in the reading exercises than LOTS were. Furthermore, Apriani (2019) found that HOTS were also less implemented in the Pathway to English textbook for tenth graders.

RQ 2: How high order thinking skills are incorporated into the reading exercise of eleventh graders English textbook published by Ministry of Education and Culture of the Republic of Indonesia?

From the findings, the author of the textbook incorporated HOTS through several questions, as an example: “The story is based on multiple themes like love, sacrifice, hope, belief and pessimism. Which one do you think is more obvious in the story? Why? Give evidence to support your answer.”; “Do you think smoking is dangerous?"; “Did this opinion article raise/change your awareness about bullying?"; “If you had a chance to rewrite the story, how would the story end? Write your ending of the story”. The HOTS questions expected the students to analyze the storyline from the reading passage that they had read before, to argue and give their opinion about the topic they had been discussed, to judge if they liked the reading passage or not, to assess their own knowledge if their awareness toward the topic changed, and last to produce something new such as an ending of the story based on their own version. Those questions enhance HOTS in students because most of the questions require students to elaborate their answer, encourage them to solve the questions in a unique way by making a visual representation in their mind, and need to connect their prior knowledge with the information they get from the text to answer the questions.

The mastery of HOTS is an important skill that students should have in this 21st century era to make them more innovative and creative so that they can adapt with the global economic growth, rapid development of technology and fast-paced world (Yen and Halili, 2015). Additionally, Trilling and Fadel in Agustina (2019) emphasizes that 21st century is oriented for learners to have high order thinking skills such as critical thinking, problem solving, creativity and innovations. in line with previous statements, Yu-hui et al., (2010) explains that critical thinking and reading are interrelated with one another because critical thinking enables students to work out reading texts by generalizing and interpreting, analyzing according to their prior or world knowledge, and synthesizing. Thus, HOTS could promote students' critical reading and evaluate information they get from the reading text.

CONCLUSION AND RECOMMENDATION

It can be summarized that the reading exercises from the English textbook for eleventh graders published by the Ministry of Education and Culture of Indonesia had already incorporated the high order thinking level though the distribution of cognitive and knowledge dimension in HOTS level was less dominant compared with that of in LOTS level. Reading questions in HOTS were found in 50 out of 107 questions or 46.7%, in which the students were asked to answer the questions by elaborating or expanding the discussion, making a visual representation, connecting their prior knowledge with what have been learnt to answer the questions.

Regardless of this research’s findings, there are several suggestions or recommendations proposed by the researchers to the following parties. First, the teachers. Teachers should check the content of the textbook, whether the exercises in the textbook really promote students’ level of thinking or not. Second, textbook writer or developer. Textbook writers need to explore more exercises which involve cognitive process not only in the lower order level but also in the higher order level. Third, the future educators. The researchers also expect that the result of this study can build future educator’s awareness of the importance of HOTS in the teaching learning process to enable the students to face the challenges of the 21st century era in all fields. Lastly, the future researchers. The findings of this research are expected to give valuable contribution to the next research.
so that the future researchers could explore more HOTS in other forms such as in the national examinations, RPPs, etc.

REFERENCES


