

LOTS vs HOTS: Evaluation of History Textbooks for Class XII Senior High School

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ABSTRACT

This study evaluates the prevalence of Lower Order Thinking Skills (LOTS) and Higher Order Thinking Skills (HOTS) questions in Indonesian History textbooks for twelfth-grade students. Utilizing a quantitative research methodology, the study analyzes the first-semester evaluation questions from textbooks published by the Ministry of Education and Culture, Erlangga, and Grafindo. Employing descriptive statistical techniques, the analysis reveals distinct disparities in the balance of LOTS and HOTS questions. Specifically, the Erlangga textbook contains 82.6% LOTS and 17.4% HOTS questions, while the Grafindo textbook shows a distribution of 96.7% LOTS and 3.3% HOTS questions. Furthermore, a comparative assessment of descriptive questions shows that the Ministry of Education and Culture's textbook exhibits a ratio of 38.9% LOTS to 61.2% HOTS, Erlangga has 73.4% LOTS to 26.6% HOTS, and Grafindo features 90% LOTS to 10% HOTS. The findings indicate a significant underrepresentation of HOTS-based questions in the analyzed textbooks, suggesting a potential gap in fostering higher-level cognitive skills among students.

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1. INTRODUCTION

21st-century education prioritizes the development of essential skills categorized as the 4Cs: communication, collaboration, critical thinking, and creativity (Septikasari, 2018). Communication skills are vital as they enable students to articulate their ideas and engage effectively with diverse audiences. Collaboration fosters an environment where students can exchange ideas, respect diverse perspectives, and work collectively towards shared objectives. Critical thinking is increasingly indispensable in an era overwhelmed by information; it empowers students to discern and evaluate the credibility of information, facilitating informed decision-making (Zubaidah, 2018). This skill is inherently linked to problem-solving, as the effective resolution of issues often requires a critical approach. Furthermore, problem-solving skills engender creativity and innovation, essential for generating novel theories and models. Creativity not only involves the generation of unique ideas but

also the courage to take risks and implement novel solutions (Muhali, 2019). Together, these skills equip students to navigate and excel in complex, dynamic environments, fostering their ability to think both critically and creatively in addressing contemporary challenges.

According to Nugroho (2018: 5), in the 21st century, students require more than the foundational knowledge of reading, writing, and arithmetic—the traditional 3Rs. They must also develop competencies such as creativity and innovation, critical thinking and problem-solving abilities, collaboration capabilities, and advanced communication skills. These four skills are crucial as they form the basis of high-level cognitive abilities (Nugroho, 2018: 5). Consequently, educational frameworks must evolve to include learning designs that actively promote the development of these advanced skills. This involves integrating problem-based learning, collaborative projects, and interdisciplinary approaches within the curriculum. By doing so, educators can provide a more dynamic and engaging learning environment that prepares students to tackle real-world challenges effectively. Moreover, this shift necessitates continuous professional development for educators to ensure they are equipped with the necessary tools and methods to facilitate this advanced level of instruction.

Students master the 4C skills by learning High Order Thinking Skills (HOTS). HOTS is a critical and creative thinking skill in processing information, making decisions, and solving problems (Markhamah, 2021). HOTS is part of the cognitive domain contained in Bloom's taxonomy. Bloom's taxonomy is a structure of competency levels introduced by Benjamin Bloom in 1956 which divides educational goals into three domains: cognitive, affective, and psychomotor (Magdalena, Fajriyati Islami, Rasid, & Diasty, 2020). HOTS in Bloom's taxonomy is in the cognitive domain with the categories of analysis (C4), synthesis (C5), and evaluation (C6), while LOTS are in the categories of knowledge (C1), understanding (C2), and application (C3) (Gunawan & Palupi, 2012). Anderson and Krathwohl later revised Bloom's taxonomy. The revised Bloom's Taxonomy changes nouns into verbs because educational goals should be able to describe cognitive processes and types of behaviour expected to be mastered by students (Gunawan & Palupi, 2012). In the revised Bloom's taxonomy, higher-order thinking skills are found at cognitive levels C4 (analyze), C5 (evaluate), and C6 (create), while cognitive levels C1 (remember), C2 (understand), and C3 (apply) are thinking skills—low-level or Low Order Thinking Skills (LOTS) (Anderson & Krathwol, 2010).

HOTS-based learning is learning that trains critical thinking skills by providing space for students to carry out investigations and problem-solving, developing collaboration and communication skills through collaborative learning, increasing creativity and innovation through learning that is flexible, personal and based on experience, and applying learning project-based and problem-based learning (Mashudi, 2021). HOTS learning needs to be taught to students starting from the lowest level of education. The discontinuity of HOTS learning from the education level before SMA/MA, namely SD/MI and SMP/MTs, resulted in students needing help understanding the mindset for learning (S, In'ami, Audia, & Masrukhin, 2023). This is also reinforced by the results of research, which show that teachers who do not provide space for students to develop critical thinking skills in the learning process result in students answering questions in an unsystematic and coherent manner (Sarwanto, Fajari, & Chumdari, 2021), HOTS-based learning needs to be implemented at every level of education to learning optimally.

Learning that emphasizes students' higher-order thinking skills can be effectively implemented using HOTS-based learning resources. This approach is substantiated by research indicating that learning modules specifically designed to foster higher-order thinking skills not only serve as practical educational tools but also significantly enhance students' critical and analytical capabilities (Najuah, Sidiq, Azhari, & Lukitoyo, 2022). By selecting HOTS-based resources, educators can systematically train students in these advanced cognitive processes. Additionally, such resources are instrumental in boosting students' abilities to engage in critical reading, as further demonstrated in recent studies (Silalahi, Herman, Sihombing, Damanik, & Purba, 2022). These resources typically incorporate complex problem-solving tasks, debates, and analytical projects that challenge students to apply, analyze, and evaluate information beyond rote memorization. Integrating these tools into daily classroom activities

not only enhances intellectual engagement but also prepares students to navigate complex, real-world issues effectively. Thus, the strategic use of HOTS-based materials is crucial for cultivating a robust educational environment that nurtures depth of understanding and intellectual agility.

As a learning resource, textbooks are prepared to help students' learning process to become competent graduates. Textbooks are prepared referring to the curriculum so that learning carried out using these textbooks can achieve national education goals (Sitepu, 2012: 37). The questions presented after the lesson material are a tool to measure the extent to which students' learning outcomes achieve learning objectives. According to (Sitepu, 2012: 89), the aspects assessed in the assessment include the aspects stated in the learning objectives. If the learning objectives include achieving indicators or competencies that encourage students to have high-level thinking skills, then the questions tested must be HOTS-based.

Advancements in technology have empowered students who possess critical reading skills to effectively discern and filter out the plethora of hoaxes that proliferate easily today (Palupi, 2020). In response to this, it is imperative for educators to meticulously select appropriate learning resources or reading materials, including textbooks, which are the primary learning resources utilized in Indonesian schools. These textbooks are meticulously crafted to align with educational objectives that promote higher-order thinking skills, thereby supporting the cognitive development of students. They incorporate evaluation tools in the form of questions that are directly tied to the learning objectives (Sitepu, 2012). Specifically, HOTS-based questions are designed to foster advanced cognitive processes and assess the extent of students' high-order thinking skills. Typically, these questions present stimuli such as scenarios, real-world situations, authentic tasks, texts, and images, encouraging students to engage with content that is both contextual and relevant to global issues spanning information technology, science, economics, health, education, infrastructure, and local environments (Nugroho, 2018; Fanani, 2018). This approach not only challenges students intellectually but also enhances their ability to apply knowledge in practical and meaningful ways.

Research related to the analysis of questions in textbooks shows that there is still a minimum of HOTS-based questions that appear in textbooks. Was proven through previous research, namely in Chemistry textbooks; the questions presented were dominated by questions with the C3 cognitive level (applying), which included LOTS-based questions. In contrast, the HOTS-based questions were only questions with only the C4 cognitive level (analyzing) (Andari, Rohiat, & Nurhamidah, 2021). Likewise, Indonesian language textbooks have HOTS-based questions that need to be improved (Huda, Purnomo, Anggraini, & Prameswari, 2021). The results of the analysis and comparison of Biology textbooks show that LOTS-based questions still dominate the questions raised in Biology textbooks, and the HOTS questions raised to test the C4 (analyzing) cognitive level (Nurnaningsih, 2021).

Previous studies have highlighted that despite the availability of guidelines for using HOTS-based assessment instruments and crafting HOTS-based questions, textbooks at the SMA/MA level frequently contain an insufficient number of questions that engage higher-order thinking skills, and often fail to demonstrate HOTS cognitive levels in the questions posed. Notably, while past research has examined textbooks for various subjects, no focused investigation has compared the Indonesian History textbooks for twelfth grade in Medan City. This study aims to assess whether the Indonesian history textbooks used in Medan City schools effectively facilitate learning and promote higher-level thinking. By analyzing the questions within these textbooks, this research seeks to contribute to a collective evaluation process for developing and selecting educational materials. It is crucial that the learning objectives aimed at students are supported by appropriate resources. Consequently, this study's examination of the characteristics of questions in Indonesian History textbooks is essential to determine their efficacy in enhancing students' higher-order thinking skills.

2. METHODS

This research uses mixed methods. This research combines qualitative and quantitative research methods in research procedures. The first stage in this research was collecting and analyzing questions in Indonesian history textbooks using content analysis data analysis techniques. The data obtained from this stage is qualitative data. The second stage is mapping the number of questions based on LOTS and HOTS using descriptive statistical data analysis techniques. The data obtained from this stage is quantitative data. The type of research data is quantitative data in the form of numbers. This research places more emphasis on quantitative methods because the results of the research are in the form of quantitative data. The data source is in the form of evaluation questions in the 1st-semester material chapter in the Indonesian History textbook for class XII SMA/MA, namely the book published by the Ministry of Education and Culture with the title Indonesian History Class the title Indonesian History for SMA/MA Class XII written by Ratna Hapsari, M. Adil, and the book entitled Indonesian History for SMA/MA/SMK/MAK Class XII. The data collection technique uses a documentation method, which is carried out by collecting Indonesian History textbooks, which are used as handbooks for students in SMA/MA level schools in Medan City in the period 2022/2023, which are then reviewed for aspects of thinking using research instruments in the form of observation sheets. Which are arranged according to cognitive levels C1-C6 to analyze cognitive levels. The data analysis technique is a descriptive statistics.

Table 1. Observation Sheets for Mapping Question Items in Class XII SMA/MA Indonesian History Textbooks Reviewed from the Cognitive Aspect of Revised Bloom's Taxonomy.

Publisher	Question Number	Cognitive Level					
		C1	C2	C3	C4	C5	C6
Ministry of Education and Culture	1						
	2						
	3						
	Etc						
	Total						
	Percentage (%)						
Erlangga	1						
	2						
	3						
	Etc						
	Total						
	Percentage (%)						
Grafindo	1						
	2						
	3						
	Etc						
	Total						
	Percentage (%)						

The characteristics of questions as LOTS or HOTS is determined through Anderson & Krathwol's (2010) explanation regarding the structure of the cognitive dimensions of Bloom's revised taxonomy, namely:

- 1) C1 (remembering). This cognitive level is a cognitive process of retrieving knowledge from long-term memory. The cognitive processes involved are recognizing and recalling.
- 2) C2 (understanding). This cognitive level constructs meaning from learning material. The cognitive processes involved are interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining.
- 3) C3 (applying). This level is implementing a stage to solve a problem. The cognitive processes involved are executing and implementing.
- 4) C4 (analyzing). Analyzing involves breaking down information into small parts and finding relationships or connections between the parts and as a whole. The cognitive processes involved are differentiating, organizing, attributing.
- 5) C5 (evaluating). At this cognitive level, the ability to make decisions based on certain criteria and standards is needed. The cognitive processes involved are checking and criticizing.
- 6) C6 (creating). In the cognitive process at this level, students are required to be able to think creatively and innovatively in arranging elements into a coherent and functional whole. The cognitive processes involved are generating, planning, and producing.

Pusat Penilaian Pendidikan (2019: 6) outlines three foundational principles essential for crafting HOTS-based questions: 1) Utilizing stimuli that prompt critical analysis, 2) Incorporating contexts that are novel to students, thereby challenging their adaptive and analytical skills, and 3) Differentiating between the difficulty level of the questions and the complexity of the required thinking processes. Complementarily, the Kementerian Pendidikan dan Kebudayaan (2019: 4) identifies three distinct characteristics that define HOTS-based questions: 1) They specifically measure Higher Order Thinking Skills, essential for cognitive development, 2) They are rooted in contextual and engaging problems that relate to real-world scenarios, enhancing relevance and student interest, and 3) They are designed to be non-routine, introducing elements of novelty that stimulate innovative thinking and problem-solving. These principles and characteristics ensure that the questions not only assess but also foster critical thinking, creativity, and problem-solving abilities among students, which are crucial for their academic and personal growth in a rapidly evolving world.

Researchers analyzed the data using descriptive statistical data analysis techniques using percentages. For the calculation of the percentage value of questions analyzed using the formula:

$$P = \frac{f}{N} \times 100\%$$

(Source: Adapted from: (Arikunto, 2003))

Information:

P: Percentage of questions analyzed in each cognitive level category

f: The number of items on the results of the analysis in each cognitive level category

N: The total number of questions analyzed

3. FINDINGS AND DISCUSSION

3.1 Findings

Each textbook studied presents evaluation questions in different forms. The presentation of different forms of questions in the textbook adjusts to the way each textbook author presents the evaluation of the question. Therefore, some textbooks are only equipped with questions-only descriptions. There are also textbooks equipped with objective questions of the type of choice, multiple and causal, and multiple choice only and essay questions.

In the Indonesian History book published by the Ministry of Education and Culture, no objective questions are raised and only description questions. Out of 18 description questions, the distribution

was dominated by questions that tested the C4 cognitive level, namely 55.6% (10 questions). Cognitive levels C3 and C5 are not shown in the problem.

The book *History of Indonesia*, published by Erlangga, has two forms of questions: objective questions of multiple choice and causation types and description questions. From a total of 115 objective questions, the distribution of questions was dominated by questions that tested the C1 cognitive level, which was 42.6% (49 questions). Cognitive levels C3 and C6 are not shown in the problem. In the description questions, 30 items were dominated by questions that tested the cognitive level C1, which was 46.7% (14 questions). C3 cognitive level does not appear in the problem.

In the book *History of Indonesia*, published by Grafindo, there are two types of questions: objective questions of the multiple-choice type and description questions. From 60 multiple-choice objective questions, the distribution of questions was dominated by questions that tested the C1 cognitive level, namely 81.7% (49 questions). Cognitive levels C3, C5, and C6 are not shown in the problem. In the description questions, 30 items were dominated by questions that tested the C2 cognitive level, which was 60% (18 questions). Cognitive levels C3 and C5 are not shown in the problem.

The research results show that questions based on the cognitive aspects of the revised Bloom's Taxonomy are unevenly distributed. A cognitive level appears outside the questions analyzed in the three books, both objective and description questions. Apart from that, the number of questions for objective questions and descriptions in the three books is different, influencing the percentages. The following table illustrates this distribution:

Table 2. Distribution of Questions in the Three Publishers of Indonesian History Textbooks for Class XII SMA/MA Semester 1 Cognitive Aspects of Revised Bloom's Taxonomy

Cognitive Level	Publishers					
	Ministry of Education and Culture		Erlangga		Grafindo	
	Number of Questions	Percentage (%)	Number of Questions	Percentage (%)	Number of Questions	Percentage (%)
I. Objective Questions						
C1			49	42.6	49	81.7
C2			46	40	9	15
C3			0	0	0	0
C4			13	11.3	2	3.3
C5			7	6.1	0	0
C6			0	0	0	0
Total Amount			115	100	60	100
II. Essay Questions						
C1	2	11.1	14	46.7	9	30
C2	5	27.8	8	26.7	18	60
C3	0	0	0	0	0	0
C4	10	55.6	4	13.3	2	6.7
C5	0	0	1	3.3	0	0
C6	1	5.6	3	10	1	3.3
Total Amount	18	100	30	100	30	100

As seen in Table 2, the research results show that the questions' distribution based on the cognitive aspects of the revised Bloom's taxonomy is unevenly distributed. A cognitive level appears outside the

questions analyzed in the three books, both objective and description questions. Apart from that, the number of questions in both the objective and the descriptions in the three books is different, affecting the percentages calculated.

In the Indonesian History textbook published by the Ministry of Education and Culture, a distinctive approach is evident as it exclusively features descriptive questions, eschewing the typical inclusion of objective questions. This method emphasizes a deeper analytical engagement with the content. The distribution of questions across cognitive levels is notably skewed, with the percentages laid out as follows: 11.1% for knowledge recall, 27.8% for comprehension, 0% for application, 55.6% for analysis, 0% for synthesis, and 5.6% for evaluation. This distribution highlights a strong focus on analysis, suggesting that the textbook aims to cultivate students' analytical skills more profoundly than other cognitive areas. Such a pattern underscores the textbook's commitment to fostering higher-order thinking skills, although the absence of application and synthesis questions points to potential areas for further development in future editions to provide a more holistic approach to historical analysis and understanding.

In the Indonesian History book published by Erlangga, two forms of questions appear: objective questions, multiple choice, and cause-and-effect type and description questions. The percentage comparison for each cognitive level in the objective test questions is 42.6%: 40%: 0%: 11.3%: 6.1%: 0%. Meanwhile, the percentage ratio for each cognitive level in the description questions is 46.7%: 26.7%: 0%: 13.3%: 3.3%: 10%.

In the Indonesian History book published by Gramedia, there are two forms of questions: multiple-choice objective and descriptive. The percentage ratio for each cognitive level in the multiple choice questions is 81.7%: 15% : 0%: 3.3% : 0% : 0%. Meanwhile, the percentage ratio for each cognitive level in the description questions is 30%: 60% : 0%: 6.7% : 0%: 3.3%.

Based on the research results, the distribution of HOTS-based questions in books published by the Ministry of Education and Culture and Erlangga is more significant than in books published by Gramedia, but not all are HOTS-based. Meanwhile, the book published by Gramedia has the lowest number of HOTS-based questions of the three books, and almost all of the multiple-choice and essay questions are LOTS-based. Details of the distribution of HOTS-based questions across the three publishers can be seen in the following diagram.

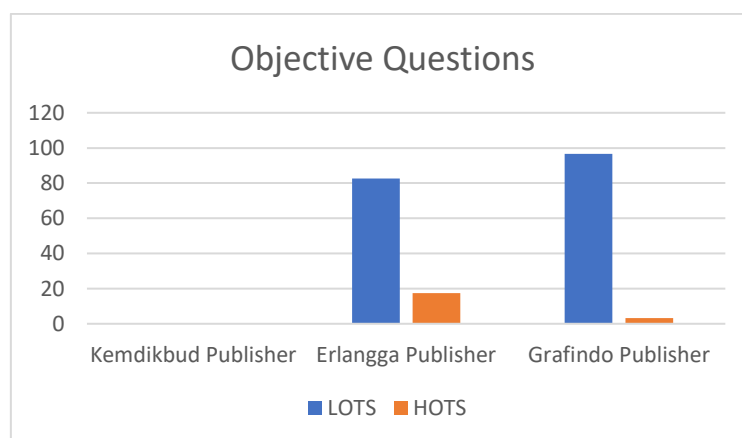


Figure 1. Percentage diagram of LOTS and HOTS-based questions on objective questions type.

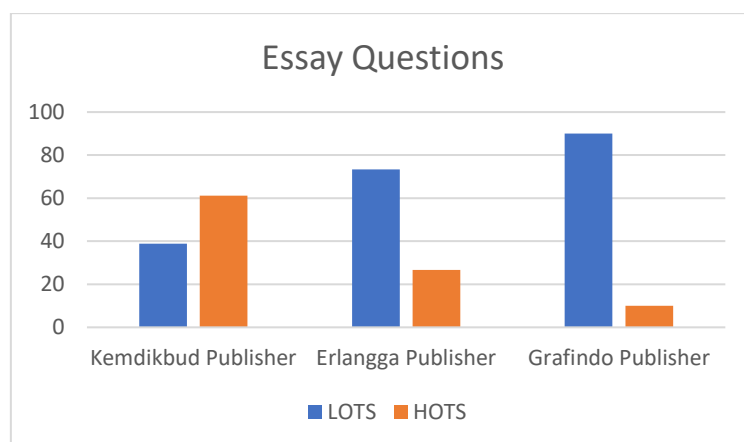


Figure 2. Percentage diagram of LOTS and HOTS-based questions on essay questions type

Figures 1 and figure 2 show the ratio of LOTS and HOTS-based questions in the Indonesian History book published by the Ministry of Education and Culture. In this book objective questions do not appear and only provide descriptive questions which is 38.9%: 61.2%. Of the 18 questions in the book published by the Ministry of Education and Culture, 7 are LOTS-based questions, and 11 are HOTS-based questions.

The comparison of LOTS and HOTS-based objective questions in the Indonesian History book published by Erlangga is 82.6%: 17.4%. Of the 115 objective questions, 95 are LOTS-based, and 20 are HOTS-based. Meanwhile, the comparison of LOTS and HOTS-based description questions was 73.4% and 26.6%. Of the 30 description questions, 22 are LOTS-based, and eight are HOTS-based.

The comparison of LOTS and HOTS-based objective questions in the Indonesian History book published by Grafindo is 96.7%: 3.3%. Of the 60 multiple-choice questions, 58 were LOTS-based questions, and two were HOTS-based. Meanwhile, comparing LOTS and HOTS-based description questions is 90%: 10%. Of the 30 description questions, 27 are LOTS-based, and three are HOTS-based.

The highest comparison of the distribution of HOTS questions among the three books is the book published by the Ministry of Education and Culture, which has a distribution of HOTS questions in essay questions of 61.2%. Followed by books published by Erlangga, namely 17.4% on objective questions and 26.6% on description questions. The lowest distribution of HOTS questions is in books published by Grafindo, namely 3.3% for multiple choice questions and 10% for essay questions.

From the diagram above, it can be seen that in the books published by the Ministry of Education and Culture, the only questions that appear are in the form of descriptions, with the distribution of HOTS questions being more numerous than LOTS questions. In books published by Erlangga and Grafindo, the questions raised are objective and descriptive. In both books, the distribution of objective form questions gave rise to more LOTS questions than HOTS; likewise, the distribution of description questions gave rise to more LOTS questions than HOTS.

3.2 Discussion

The learning framework in the 21st century is meticulously designed to cultivate human resources equipped with the competencies that align with contemporary advancements, specifically the abilities to think critically, creatively, and collaboratively, alongside possessing robust communication skills. To truly foster these capabilities, students must be engaged in a learning environment that not only allows but actively encourages the development of these skills through exposure to higher-order thinking challenges. Implementing HOTS (Higher Order Thinking Skills) learning methodologies is crucial in this context. According to Wibawa & Agustina (2019), such educational strategies enable students to process diverse information swiftly, apply creative solutions to problems, and navigate complex decision-making scenarios effectively. Furthermore, this approach promotes adaptability and resilience, preparing students to thrive in dynamic and sometimes unpredictable modern

environments. By integrating these skills into the curriculum, educators provide a comprehensive education that extends beyond traditional learning outcomes to include essential 21st-century skills.

According to Subakti (2021), the implementation of HOTS (Higher Order Thinking Skills) learning in history subjects within Indonesia requires significant enhancement. This observation is supported by findings from Budiarta, Harahap, Faisal, & Mailani (2018), which indicate that the application of HOTS methodologies in elementary schools has not yet achieved successful outcomes. Moreover, Rapih & Sutaryadi (2018) highlight a discrepancy in teaching practices, noting that while teachers may incorporate HOTS principles during the planning stages of their lessons, this integration often does not translate into the actual execution of teaching and assessment activities. This inconsistency suggests a need for further training and support for teachers to ensure that HOTS principles are not only understood but also effectively implemented throughout the learning process. Addressing these gaps can lead to a more robust adoption of HOTS strategies, potentially transforming educational practices and enhancing student outcomes in critical thinking, problem-solving, and creative thinking across all subjects.

As a learning resource, textbooks are a reference teachers and students use in the learning process. The research results found that the questions in the Class XII Indonesian History textbooks were partially HOTS-based. Based on the comparison percentage of LOTS and HOTS, only books published by the Ministry of Education and Culture raise more HOTS questions than LOTS questions. Meanwhile, Erlangga and Grafindo published two other books that show more LOTS of questions than HOTS ones. The three books that only provided HOTS-based questions were considered less supportive of learning and exacerbated the low implementation of HOTS-based learning. Learning that aims to improve students' high-level thinking skills should use HOTS-based assessments in order to measure students' high-level thinking skills. HOTS-based assessment also prepares students' competencies for the 21st century, fosters a sense of love and care for regional progress, increases students' learning motivation, and improves the quality and accountability of learning outcomes assessments (Subakti, 2021).

Research shows that HOTS-based teaching materials effectively improve students' high-level thinking skills (Heryani, 2023). Therefore, textbook writers need to review the questions prepared when composing textbooks. According to (Budiarta et al., 2018), teachers' understanding of the concept and application of HOTS when implementing HOTS-based learning still needs to be improved due to a lack of training and mentoring oriented towards examples of direct application. Teachers must improve their understanding and skills in selecting HOTS-based textbooks. It is important for schools and teachers to choose HOTS-based textbooks not only for certain subjects but also for all subjects including Indonesian History. As found in this research, it turns out that the Indonesian History books used in schools in Medan City raise more LOTS questions than HOTS. Using books as an appropriate learning resource will support the implementation of HOTS-based learning so that students' high-level thinking skills are trained. The student's cognitive level reflects the student's level of development and thinking (Adesoji, 2018).

4. CONCLUSION

A comparison of the composition of HOTS and LOTS questions in the three Indonesian History textbooks for SMA/MA Class LOTS and HOTS were 96.7%: 3.3%. Regarding description questions, the book published by the Ministry of Education and Culture has a percentage ratio of the number of LOTS and HOTS-based questions of 38.9%: 61.2% of the total 18 essay questions. The book published by Erlangga has a percentage ratio of the number of questions based on LOTS and HOTS of 73.4%: 26.6% of the total 30 essay questions. The book published by Grafindo has a percentage ratio of the number of questions based on LOTS and HOTS of 90%: 10% of the total 30 essay questions. Teachers must have understanding and skills in selecting learning resources appropriate to students' cognitive levels per the applicable curriculum.

Based on the research results, it was found that the books studied used more LOTS-based questions than HOTS-based questions. As a result, students are tested to answer more LOTS-based questions even though the learning objective should be HOTS; therefore, the evaluation questions in the book should also be HOTS-based questions. It is necessary to evaluate the preparation of evaluation questions in textbooks. Researchers recommend that future research examine the suitability of the material with basic competencies and indicators in textbooks.

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