



# Analysis of Problems in Thematic Books Based on Anderson and Krathwohl's Cognitive Levels

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**Abstract.** This study aims to analyze the distribution of questions in the Thematic Book Class VI Theme 6 Towards a Prosperous Society based on Anderson and Krathwohl's cognitive levels. This content analysis research used a descriptive qualitative approach. The data in this study were the distribution of questions categorized according to Anderson and Krathwohl's cognitive level. The instrument validity employed the FGD technique and the Aiken formula, while the data validity used increased persistence and triangulation of investigators. Sources were obtained from the teacher's book and the student's book. The data collection technique was a document study. The data analysis technique utilized was an interactive analysis model from Miles and Huberman. The results of this study obtained 44.77% for C1, 40.12% for C2, 0% for C3, 8.72% for C4, 1.74% for C5, and 4.65% for C6. From these results, it can be concluded that the questions in the book did not meet the criteria for a good distribution of questions based on the opinions of Helmawati (2019) and Sudjana (2016) and only provided questions with the HOTS category of 15.11%.

**Keywords:** Thematic Books, Cognitive Level, Elementary School, Anderson and Krathwohl

## 1 Introduction

In the industrial revolution 4.0 era as it is today, the learning needed involves higher-order thinking skills [1]. Therefore, the Indonesian Minister of Education 2018 began to apply higher-order thinking skills (HOTS) standards nationally [2]. The use of HOTS is not only in assessment but also in learning tools. On the other hand, curriculum, learning process, and assessment are three of the many vital dimensions in education [3]. The curriculum elaborates educational goals as the basis of a learning program [1]. The learning process is an effort made by educators to achieve the curriculum goals. Meanwhile, assessment is one of the activities carried out to measure or assess the level

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Meanwhile, assessment is one of the activities carried out to measure or assess the level of curriculum achievement and the success of the learning process. In addition, Wiliam (2011) stated that only through assessment can individuals determine whether a certain series of learning activities have produced the desired learning outcomes. The meaning of evaluation is the same as assessment [4].

Assessment is defined as a term covering any activity in which evidence of learning is collected in a planned and systematic way and used to make judgments about learning [5]. Assessments are different from evaluations, measurements, and tests, but they have a hierarchical nature [3]. Evaluation is preceded by an assessment, an assessment is preceded by a measurement, and measurement is preceded by a test. The assessment is divided into two, formative and summative assessments. The difference between the two relates to the purpose of the assessment and the function it actually serves [4]. Summative assessment is used to report to students and others regarding the achievement of the overall goal over time, where the assessment can be described as a learning assessment. Meanwhile, if the use is by students and teachers to decide where students are in learning, where they need to go, and how best to get there, assessment is described as formative or assessment for learning [5].

This assessment is also contained in the K13 Integrated Thematic Book, i.e., formative assessment. Formative assessment serves to help students identify strengths, build knowledge, and improve abilities. For teachers, formative assessment monitors student learning, ensures student progress, and checks student understanding [6]. In the same book, it is explained that the new curriculum expects teachers to give more portion to the implementation of formative assessments to support the optimization of learning activities. In addition, habituation can improve higher-order thinking skills by working on higher-order thinking skill (HOTS) type questions in the learning process [7]. Hel-mawati (2019) explained that assessing a good cognitive aspect should include 60% LOTS (lower-order thinking skills) and 40% HOTS. In this case, the K13 Integrated Thematic Book presents a learning experience using higher-order thinking skills [8].

In fact, in the research conducted by Saputra & Usman (2021) regarding Problem Analysis in Integrated Thematic Books for Class V Theme 3 Healthy Food 2013 Curriculum Based on Thinking Ability Level, the percentage proportion of cognitive level had not been able to support students' higher-order thinking skills, in which 75.52 % were on LOTS and 14.48% were on HOTS [9]. It was also found in a study carried out [10] on the Analysis of Items for Class V Student Books Theme 1 Organs of Movement of Animals and Humans Based on Taxonomy, showing an imbalance between cognitive levels with easy, medium, and difficult categories, with 83% of LOTS and 17% of HOTS. Therefore, the K13 Integrated Thematic Book for Class VI Theme 6 needs to be analyzed. The analysis in question is to determine whether the quality of the questions in the book facilitates students' higher-order thinking skills. It is because textbooks as teaching materials or learning resources used in the learning process should be able to support increasing students' knowledge and abilities. This opinion aligns with Cambliss dan Calfee [11] that textbooks have great power to change students' brains because they can affect certain knowledge and values, so it is only natural that some components of questions in books improve students' abilities.

The analysis used Anderson and Krathwohl's revised Bloom taxonomy because compared to SOLO, Marzano, and Fink's taxonomy, Bloom's taxonomy focuses more on cognitive aspects emphasizing knowledge and thinking skills and can be used to assess learning processes and outcomes based on the difficulty level. Therefore, Bloom's taxonomy is suitable for analyzing the assessment. Bloom's taxonomy divides cognitive abilities into six levels based on students' cognitive processes in the form of verbs, such as remembering (C1), understanding (C2), applying (C3), analyzing (C4), evaluating (C5), and creating (C6). Köksal & Ulum (2018) asserted that using Bloom's taxonomy is a beneficial way to assess learning activities and teaching materials. Also, grading using Bloom's Taxonomy yields essential information for educators. Educators become more aware of the content and processes they teach and value and point out the differences between what is taught and what is assessed to further serve as a guide for the development and expansion of learning and assessment activities [12]. Moreover, the Integrated Thematic Book is a living book, the contents of which can be developed and adapted to the conditions of students at school. In addition, Bloom's taxonomy also categorizes the levels of remembering, understanding, and applying as lower-order thinking skills (LOTS) while analyzing, evaluating, and creating as higher-order thinking skills (HOTS) [13].

This research's subject took the questions in the K13 Thematic Book Class VI Theme 6 Towards a Prosperous Society. The government has published K13 Integrated Thematic Book, distributed to all schools in the country as a mandatory handbook for teachers and students in helping the teaching and learning process, so this book has been widely used in Indonesia. On the other hand, class VI is upper grade in elementary school. The students in the upper grade have thought and created fully [14]. Ramlah (2022) also revealed the characteristics of sixth-grade elementary school children, some of whom are very realistic and curious about learning [15]. Therefore, it is hoped that learning can motivate students to satisfy their curiosity and learn. Motivation can be stimulated using tasks with optimal difficulty [16]. In addition, cognitive assessment is essential because one of its functions is motivating students. Meanwhile, the theme is a place to introduce various material concepts to students as a whole [17]. The Integrated Thematic Book Class VI already contains nine abstract themes, one of which is Theme 6 Towards a Prosperous Society. This theme aligns with Indonesia's objectives as stated in the Preamble to the 1945 Constitution, namely "promoting public welfare"; it means that the state has goals and hopes for a prosperous society.

The same research has been carried out by Prasadena (2020) with the title Analysis of the Cognitive Process Dimensions in Practice Questions in the Class V Student Book Theme 2 Based on Bloom's Taxonomy and Saputra & Usman (2021) with the title Analysis of Items in the Integrated Thematic Book Class V Theme 3 Food Healthy Curriculum 2013 Based on Thinking Ability Level. Yet, the difference between this study and previous studies is the research subject, where this study used the subject of Class VI Theme 6 Towards a Prosperous Society. In addition, the urgency of this research is emphasized in proving the questions in the 2013 Curriculum Thematic Books related to providing students with higher-order thinking experiences.

The thought explanation above became the background that prompted the writers to conduct research entitled “Analysis of Problems in Thematic Books Based on Anderson and Krathwohl’s Cognitive Levels.”

## 2 Research Method

This content analysis research used a descriptive qualitative approach. This research was conducted in Surakarta City. The object under study was the questions. The instrument employed a document analysis sheet validated by the FGD technique and the Aiken formula. Meanwhile, the data validity used increased the persistence and triangulation of investigators. Sources were obtained from the K13 Integrated Thematic Book for Class VI Theme 6 Towards a Prosperous Society. In addition, the data collection technique was document study, while the data analysis technique utilized an interactive analysis model [19]

## 3 Results and Discussion

The book under study was the Integrated Thematic Book Class VI Theme 6 Towards a Prosperous Society, published by the Ministry of Education and Culture through the Center for Curriculum and Books. The questions in the book were analyzed based on the cognitive level of Anderson and Krathwohl [20], consisting of six levels: remembering (C1), understanding (C2), applying (C3), analyzing (C4), evaluating (C5), and creating. (C6). There were 174 questions in the Integrated Thematic Book Class VI Theme 6 Towards a Prosperous Society. Then, the questions were categorized based on their level. The analysis results were again presented and displayed in the following table.

**Table 1.** Percentage of Cognitive Level Distribution of Questions

Sub-theme	LOTS		HOTS				The number	Percentage
	C1	C2	C3	C4	C5	C6		
Sub-theme 1	45	33	0	4	0	0	82	47.67%
Sub-theme 2	10	13	0	6	1	2	32	18.60%
Sub-theme 3	22	23	0	5	2	6	58	33.72%
The number	77	69	0	15	3	8	172	
Percentage	44.77%	40.12%	0.00%	8.72%	1.74%	4.65%		
Total	84.88%		15.12%					100%

Based on Table 1, the total number of questions in the Integrated Thematic Book Class VI Theme 6 Towards a Prosperous Society was 172. Judging from the distribution of cognitive levels, it can be concluded that the questions in the Thematic Book Theme 6 had different numbers. There were 77 or 44.77% of questions with C1 level (remembering); there were 69 or 40.12% of the questions with C2 level (understanding); questions with C3 level (applying) were not found in sub-themes one, two, and three; there were 15 or 8.72% questions with C4 level (analyzing); there were 3 or

1.74% questions with C5 level (evaluating); there were 8 or 4.65% questions with C6 level (creating). The following is a discussion of the questions at each level:

### **3.1 Remembering Level (C1)**

The remembering level (C1) in the cognitive aspect [20] is the first or basic level. The operational verb (KKO) used at the remembering level consists of seven words. From the analysis results, the cognitive level of C1 was found in sub-theme 1 of 45, sub-theme 2 of 10, and sub-theme 3 of 22. In the cognitive level of remembering, KKO that often appeared was “mentioning.”

### **3.2 Understanding Level (C2)**

The understanding level (C2) in the cognitive aspect [20] is the second level. The operational verbs (KKO) used at this understanding level consist of 12 words. In the analysis results, the cognitive level of C2 was found in 32 sub-theme 1, 13 in sub-theme 2, and 23 in sub-theme 3. At the cognitive level of understanding, the KKO that often appeared was explaining.

### **3.3 Applying Level (C3)**

The cognitive level of applying (C3) in the cognitive aspect [20] is the third level. The operational verbs (KKO) used at the comprehension level consist of seven words.

### **3.4 Analyzing Level (C4)**

The cognitive level of analyzing (C4) in the cognitive aspect [20] is the fourth level. The operational verb at the cognitive level analyzing used in the research study of this document consists of eight words. Analysis of the cognitive level questions revealed five operational verbs not found in the Thematic Book Class VI Theme 6: explore, select, detail, separate, and attribute.

### **3.5 Evaluating Level (C5)**

The cognitive level of evaluating [20] is the fifth level. Seven operational verbs at the evaluating level were used in this study. The analysis results of the cognitive level test found that only three questions were included: two with the operational verb assess and one with the operational verb consider.

### **3.6 Creating Level (C6)**

The cognitive level of creating (C6) was only found in eight questions: one question with the operational verb planning, three questions with the operational verb telling, and four questions with the operational verb creating, as the most.

## 4 Conclusion

Based on the study results, the questions of the remembering level (C1) were the most dominant in the Integrated Thematic Book Class VI Theme 6 Towards a Prosperous Society, with operational verbs (KKO) “mentioning” as the most occurrences. Meanwhile, the applying level (C3) appeared the least. Applying is a cognitive level where students use certain procedures to work on problems. In the Thematic Book Class VI Theme VI, no questions need procedures to solve, such as the calculation questions.

This research has two implications, namely theoretical and practical implications. The theoretical implication of the results of this study is that it can add insight to knowledge about the cognitive level and be a reference for further research. For practical implications, the results of this study can be considered by teachers or schools in developing assessments. The results of this study can also be used as input and evaluation material by the K13 Integrated Thematic Book development team for improvement in the next revised edition.

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