Using Bloom's Taxonomy to Evaluate HOTS in the Tasks of the Chinese Grade 7 English Textbook

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Abstract. This study evaluates the cognitive demands of tasks in the Chinese Layman's Edition Grade 7 English textbook using Bloom's Revised Taxonomy. The primary objective is to assess the distribution of lower-order thinking skills (LOTS) and higher-order thinking skills (HOTS) across the textbook's tasks. Six cognitive categories were identified through a content analysis of 224 tasks: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating. The findings show that just 26.7% of activities concentrate on HOTS, such as Analyzing, Evaluating, and Creating, whereas 73.3% of tasks concentrate on LOTS, especially in Understanding and Applying. This disparity implies that fundamental cognitive abilities are being overemphasized, which is preventing children from engaging in critical analysis, evaluation, and innovation. The study emphasizes the need for textbook changes that support students' cognitive growth and are in line with contemporary educational objectives by better integrating HOTS-oriented tasks. Recommendations for curriculum enhancement and instructional strategies are provided to better prepare students for real-world challenges through more complex cognitive engagement.

Keywords: Bloom's Revised Taxonomy; Higher-order Thinking Skills (HOTS); Lower-order Thinking Skills (LOTS); Cognitive Development; Textbook Analysis.

1. Introduction

In the field of contemporary education, the development of higher-order thinking skills (HOTS) has become a critical objective, especially within the realm of English language education. The idea has been studied and improved upon over time, and the incorporation of Bloom's Taxonomy provides a crucial framework for assessing and improving HOTS in educational assignments [1-2]. The purpose of this research is to investigate how Bloom's Taxonomy can be used to evaluate HOTS in the tasks included in the Chinese Layman's Edition Grade 7 English Textbook. The study will concentrate on the pedagogical implications and prospects for curriculum enhancement. .

The origin and evolution of Bloom's Taxonomy have significantly influenced educational practices, providing a scaffold for designing learning experiences that foster cognitive development [1]. The revised taxonomy, with its emphasis on active learning and metacognitive knowledge, offers a more inclusive approach to educational objectives [2]. This study draws upon the insights from previous research to analyze the current state of task design in English textbooks and to propose strategies for aligning them with the cognitive demands of Bloom's Taxonomy.

Cultivating students' HOTS has become increasingly important with the shift in educational goals. Students today need to be capable of critical thinking, innovative problem-solving, and effective communication in the context of globalization and information technology. Therefore, it should be a priority to construct English textbooks and instructional activities with an emphasis on helping students acquire these skills. The goal of the study is to further the conversation about innovative teaching practices in education and the development of HOTS in English language instruction..

2. Literature Review

2.1. Origin and development of Bloom's Taxonomy

Benjamin Bloom first proposed Bloom's Taxonomy in 1956. It has served as a foundational framework for educators to categorize and prioritize educational objectives. The taxonomy organizes

cognitive educational goals into six levels: knowledge, comprehension, application, analysis, synthesis, and evaluation [1]. The rising complexity of cognitive skills has been emphasized through curriculum creation and teaching practices that have been greatly aided by this hierarchical structure..

In 2001, L.W. Anderson and D.R. Krathwohl advanced the taxonomy by transitioning the level names from nouns to verbs, aligning more closely with the active and dynamic nature of learning. This revision underscores the significance of participating actively in the educational process. Additionally, they introduced a metacognitive knowledge dimension, which recognizes the role of self-awareness and self-regulation in learning [2]. This enhancement broadens the taxonomy's scope, acknowledging the significance of reflective thinking and self-monitoring in educational attainment.

Critically, the evolution of Bloom's Taxonomy has significantly helped the field of education by offering a framework for creating educational experiences that foster HOTS. Even while taxonomies have a big impact on cognitive development and how education is conducted, I think we need a more inclusive framework to deal with interdisciplinary approaches and various learning styles. The complexity of contemporary educational aims, which frequently go beyond cognitive capabilities to encompass social, emotional, and cultural competencies, may be too much for taxonomies to capture in their current form.

2.2. Application of Bloom's Taxonomy in Educational Practice

Bloom's Taxonomy has been extensively used in the area of education, especially in curriculum design, teaching assessment and learning activity design. Studies have demonstrated the utility of the taxonomy in improving students' higher-order thinking skills (HOTS). For instance, Lim found that in Korean sixth-grade English textbooks, the majority of activities were focused on lower-order thinking skills (LOTS), calling for more tasks that foster critical and creative thinking [3]. Similarly, Miyazaki's study on Japanese eighth-grade English textbooks revealed a similar pattern, with most tasks targeting LOTS, and limited tasks designed to develop HOTS [4].

Further supporting this, Li's research on English teaching in junior middle schools in China highlights how questioning techniques, when aligned with Bloom's Taxonomy, can effectively stimulate cognitive development [5-9]. This study underscores the importance of integrating HOTS-oriented questions into classroom instruction to push beyond mere knowledge recall.

2.3. Task design in English textbooks

Task design in the textbooks is crucial for the improvement of learners' language abilities. In many educational contexts, the design of tasks in English textbooks tends to favor LOTS over HOTS. Numerous studies that examined textbooks from various geographical areas discovered a recurring trend in which the majority of the assignments focused on lower-order cognitive skills. In order to promote cognitive engagement at all levels, task design can be improved by more closely conforming with Bloom's Taxonomy, according to Luo's examination of IB MYP English textbooks [9]. In the meantime, Wang and Xiong have both shown how well-crafted tasks and questions can promote students' development of their analytical and evaluative abilities, especially in junior high and rural school contexts [10-11].

In the context of English teaching, the incorporation of higher cognitive tasks has shown positive effects on students' language skills and overall cognitive development. As Zhang [7] pointed out, transitioning from LOTS to HOTS is crucial for preparing students to tackle complex real-world tasks, further reinforcing the need for textbook reforms that better integrate these skills.

2.4. Summary

This study delves into the application of Bloom's Taxonomy in assessing HOTS tasks in English textbooks through a literature review and analyzes its practical effects in different educational contexts. When it comes to evaluating and developing the assignments in English textbooks, Bloom's Taxonomy is an invaluable resource. It particularly helps to develop students' higher-order thinking abilities. Bloom's Taxonomy gives teachers a useful tool for creating and evaluating learning

activities that support students' cognitive growth, but there is still a disparity in how it is applied in practice, with most textbook exercises emphasizing LOTS and less on HOTS. This effect might prevent learners' cognitive capabilities from improving overall. To help students go from lower-order to higher-order thinking, teaching methods must change from a single knowledge transfer to a more interactive and inquiry-based approach. In addition, textbooks and instructors should design diverse tasks, especially those that stimulate students' analytical, evaluative and creative abilities, to meet the demands of different cognitive levels. Research on China's Saiyan version of Grade 7 English textbooks should focus on how to better integrate Bloom's Taxonomy in order to drive the overall improvement of students' cognitive abilities.

Future studies should concentrate on how Bloom's Taxonomy is used in Chinese English instruction, particularly how well it works to improve students' higher-order thinking abilities. The research will explore how to optimize textbook content with respect to Chinese syllabus and student characteristics, evaluate the effectiveness of instructional implementation, and use technology to enhance instructional interactions in an effort to encourage pupils' critical and creative thinking growth.

3. Methodology

3.1. Research Design

This research uses a content analysis methodology to evaluate the cognitive demands of the tasks in the Chinese Layman's Edition Grade 7 English textbook. Content analysis is well-suited for analyzing educational materials, as it allows for the systematic classification of textual elements based on predefined categories. In this case, the analytical framework, provided by Bloom's Revised Taxonomy, allows tasks to be categorized based on six cognitive levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating [2]. The use of content analysis ensures that each task in the textbook is objectively and rigorously evaluated based on cognitive complexity.

3.2. Materials

The Chinese Layman's Edition Grade 7 English textbook was selected for this study as it is widely used in middle schools across China. This textbook was chosen because it represents the standard curriculum for grade 7 students and provides a comprehensive set of tasks aimed at developing language skills. The selection is strategic, as the textbook's tasks reflect both the national curriculum standards and the broader goals of English language education in China. Additionally, this edition allows for a focused investigation of how cognitive processes are embedded in textbook tasks.

3.3. Data Collection

The technique of gathering data entailed classifying and identifying each task and exercise in the textbook. This comprised exercises like discussion starters, writing projects, listening exercises, and reading comprehension questions. Throughout the many chapters of the textbook, a total of 224 assignments were found. After a thorough analysis to identify each task's main cognitive focus, each task was categorized using Bloom's Revised Taxonomy's six levels: remembering, understanding, applying, analyzing, evaluating, and creating.

To ensure accuracy, the classification was conducted by two independent researchers with expertise in educational content analysis. Any discrepancies in task classification were resolved through discussion and consensus. This process was designed to increase the data's dependability and minimize potential biases in the classification of cognitive levels.

3.4. Data Analysis

Once the tasks were categorized, the frequency and percentage of tasks at each cognitive level were calculated to determine the distribution of cognitive demands within the textbook. The analysis focused on identifying how frequently tasks required students to engage in LOTS (Remembering, Understanding, Applying) versus HOTS (Analyzing, Evaluating, Creating). This frequency distribution was used to address the research questions regarding the emphasis placed on different cognitive processes in the textbook.

Furthermore, the total percentage of tasks classified as LOTS and HOTS was computed to offer a more comprehensive comprehension of how the textbook strikes a balance between more intricate, higher-order abilities and fundamental cognitive processes. To identify any disparities or recurring themes, the outcomes were contrasted with those of related studies on textbook analysis conducted in various educational settings.

3.5. Reliability and Validity

Inter-rater reliability, which gauges the degree of agreement between the two researchers' task classifications, was computed using Cohen's kappa coefficient in order to confirm the validity of the content analysis. A kappa value above 0.75 was considered satisfactory, indicating a high level of agreement between coders.

The analysis's validity was further increased by triangulating it with earlier studies on comparable textbook studies, which made sure that the classification framework and findings agreed with accepted practices and field findings [4]. The findings are validated through this method, which also makes sure that the findings appropriately reflect the cognitive demands of the textbook.

4. Case Analysis

4.1. Research Question

Question1: whatever textbook tasks, according to the updated Bloom's taxonomy, relate to whatever cognitive level? What are the frequency and percentage of these tasks?

Question2: What proportion of the tasks in the textbook emphasize lower-order thinking skills (LOTS) and higher-order thinking skills (HOTS)?

4.2. Result

Table 1 shows the breakdown of each question level within the textbook. These results highlight a significant emphasis on the lower-order cognitive processes, especially at the Understanding level.

Table 1. Cognitive Level Analysis

Cognitive Level	Number of Tasks	Percentage (%)
Understanding	102	39.4%
Applying	53	20.5%
Analyzing	32	12.4%
Evaluating	19	7.3%
Creating	18	7%

Bloom’s taxonomy separates cognitive processes into HOTS (Analyzing, Evaluating, Creating) and LOTS (Remembering, Understanding, Applying). In the seven-year English textbook, 18 tasks were classified under Creating, 19 under Evaluating, and 32 under Analyzing, accounting for 26.7% of all tasks as HOTS. On the other hand, 73.3% of the tasks concentrates on LOTS, emphasizing Understanding (102 tasks) and Applying (53 tasks).

5. Discussion

The outcomes of the textbook analysis based on Bloom's Revised Taxonomy are discussed in the findings section. It highlights an imbalance in the cognitive demands placed on students. The analysis of the English textbook's tasks revealed a heavy concentration on LOTS, specifically in the Understanding and Applying categories, while HOTS such as Analyzing, Evaluating, and Creating were underrepresented.

The findings revealed that 102 tasks (or 39.4%) dominated the cognitive processes that students were expected to do and corresponded to the Understanding level. This result is consistent with earlier studies that have shown language textbooks have a tendency to emphasize comprehension over higher-order cognitive processes [2–12]. Understanding is prioritized in language learning, especially in the early stages, to make sure children understand fundamental vocabulary and structures. This may be one explanation for the emphasis on comprehension. Prior to advancing to more sophisticated abilities like analysis and production, this fundamental method is thought to be necessary for developing language competency.

In contrast, only 32 tasks (12.4%) involved Analyzing, 19 tasks (7.3%) focused on Evaluating, and 18 tasks (7%) engaged students in Creating. These findings imply that there are little possibilities for children to acquire critical thinking and original problem-solving techniques, a pattern also observed in studies such as Lim's analysis of Korean textbooks [3]. This imbalance may stem from the challenge of designing tasks that foster higher-order thinking, as these require more instructional time and complex assessment methods. While consistent with earlier research, this trend raises concerns about the limited cognitive engagement in language learning materials, reinforcing the need for textbooks to integrate more tasks that develop HOTS.

This distribution aligns with broader trends observed in language education, where textbooks often prioritize LOTS over HOTS, focusing on rote memorization and comprehension rather than engaging students in more complex cognitive tasks. The development of critical thinking and problem-solving abilities, which are necessary for adjusting to progressively difficult academic tasks and real-world circumstances, may be hampered by this concentrate on the subject. The overemphasis on Understanding and Applying also points to a discrepancy between the curriculum's intended goals, which are to help students acquire higher order cognitive skills, and the actual teaching resources that are being made available to them. [1-14].

Moreover, in the second research question, the analysis revealed that 26.7% of the textbook tasks focus on HOTS, while a significantly larger 73.3% focus on LOTS. This confirms the trend that while higher-order skills are not entirely neglected, they are substantially underrepresented compared to lower-order skills. The minimal representation of HOTS is a difficulty for promoting students' deeper cognitive involvement, which is consistent with similar findings in earlier studies of language textbooks [12]. The disparity implies that although the textbook offers a basis for fundamental cognitive growth, it might not be entirely in line with learning objectives that stress creativity and critical thinking as vital 21st-century abilities.

In studies like that of Zhang [7], It is emphasized that shifting from lower-order to higher-order thinking is crucial for better preparing students for complex real-world tasks. The limited focus on HOTS in the Chinese Layman's Edition Grade 7 English Textbook may reflect a broader issue in educational material design, where tasks that encourage synthesis, analysis, and evaluation are often sidelined in favor of easier-to-assess cognitive activities like understanding and applying [1-2].

While the textbook provides a robust framework for developing foundational skills, there is a clear need to incorporate more tasks that promote higher-order thinking skills. This is in line with suggestions made by educational theorists like as Bloom and Anderson, who support equitable cognitive development at every taxonomic level [13]. In order to better prepare students for the cognitive demands of modern society and education, future updates of instructional materials should incorporate additional activities focused on the Humanities and Social Sciences (HOTS) [2-4].

6. Conclusion

This study examined the cognitive demands of tasks in the Chinese Layman's Edition Grade 7 English Textbook through the lens of Bloom's Revised Taxonomy. The findings reveal that while the textbook covers all six levels of cognitive processes, there is a significant emphasis on LOTS, particularly at the levels of Understanding and Applying. The data shows that 73.3% of the tasks focus on LOTS, with only 26.7% aimed at HOTS, such as Analyzing, Evaluating, and Creating. This disproportionate emphasis on LOTS reflects a common trend in language education materials, where tasks often prioritize comprehension and basic application over more complex cognitive processes like assessment, critical thinking, and creativity in solving problems.

The underrepresentation of HOTS in the textbook indicates a need for curriculum and instructional design revisions. Textbooks ought to provide a more balanced cognitive framework since the development of HOTS is crucial to enabling students to successfully negotiate the complexities of contemporary academic and real-world difficulties. The textbook will be more in line with current educational goals, which emphasize the development of 21st century skills like creativity, critical thinking, and problem-solving, if it has more assignments that require students to participate in critical analysis, persuasive reasoning, and creative output.

Future revisions of the textbook should incorporate more HOTS-oriented activities, encouraging students to engage with content at a deeper cognitive level. Furthermore, in order to ensure that students apply what they have learned to analyze, evaluate, and create, teachers should be provided with strategies to enhance higher-order thinking in their education. This shift is necessary to prepare pupils for the demands of an increasingly complex and dynamic environment.

Although the textbook provides a solid foundation for language learning, the integration of more tasks that promote HOTS is necessary to achieve a more comprehensive and balanced approach to cognitive development. By addressing this gap, educational materials can help students become more ready for the intellectual and practical challenges they may meet in both their academic careers and broader life contexts.

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