

Liberal Journal of Language & Literature Review
Print ISSN: 3006-5887
Online ISSN: 3006-5895
[**https://llrjournal.com/index.php/11**](https://llrjournal.com/index.php/11)

**INTEGRATION OF CRITICAL THINKING SKILLS IN PRIMARY
SCHOOL STUDENTS THROUGH ENGLISH TEXTBOOKS: A
CONTRAST BETWEEN FREQUENCY AND NATURE OF
CRITICAL THINKING EXERCISES IN PTB AND CAMBRIDGE
ENGLISH TEXTBOOKS**



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Abstract

This study aims to explore the role of textbooks in integrating critical thinking skills at the primary level. For this purpose, the frequency of higher-order thinking in textbooks of grade 4 is observed. The data for this research are taken from two English textbooks of grade 4. One is the Punjab Curriculum and Textbook Board, and the other is the Cambridge Primary English. A comparison is made to determine which textbook focuses more on critical and analytical thinking exercises and fulfils the objectives described in Bloom's taxonomy. It is found that there are fewer Higher Order Thinking questions in the PTB book than Lower Order Thinking questions, indicating the least focus on developing students' cognitive abilities. In the Cambridge textbook, this ratio gradually increases chapter-wise, showing a step-by-step development of critical thinking skills among students.

1. Introduction:

Critical thinking is a self-analytical process that is very important during a child's developmental years. Developing critical thinking in the early years is very important because it helps children think beyond what is taught and fosters revolutionary thinking as they grow up,, which is very important in this fast-paced world that prioritizes “thinking beyond borders” over crammed knowledge. Crammed knowledge is static because it makes children loop into the same circle of knowledge, whereas critical thinking is dynamic, as it fosters problem-solving skills and the ability to analyze information, which leads to new ideas.

It is of paramount importance for primary students, as this is the age when habits develop that last a lifetime. Primary students who are taught to practice critical thinking and those who are deprived of this skill are like the taste of a cake baked with low-quality ingredients compared to the same flavor made with high-quality ingredients. It is important to note that the significance of critical thinking lies not only in reasoning, but also in applying this skill to real-life situations. (Mr. Tilak Raj, 2022)

So, what are students at primary schools exposed to the most? The answer is “textbooks in class”. Primary school students are mostly taught using textbooks designed for students of every grade, taking into account their stage of cognitive development. So, to develop critical thinking skills in primary schools, students' textbooks could be a target. These are the very medium through which students can be easily and effectively exposed to critical thinking skills.

As discussed earlier, critical thinking is the ability to analyze given input and produce an output, irrespective of general points of view. This skill varies from student to student depending upon their age, exposure, and cognitive stage. This research has targeted English-language student textbooks for grade 4 in Pakistan. In Pakistan, every province has its own educational board. The provincial education board is responsible for creating local syllabi, influenced by each province's culture, language, and regional values. The textbooks created by these local educational boards are quite economical and are taught in public schools across their respective provinces in Pakistan. In contrast, private schools across Pakistan use textbooks by Oxford University Press or Cambridge Board, which are quite expensive. For this study, a textbook by the Punjab Curriculum and Textbook Board (PTB) is taken. A comparison has been made, using English-language textbooks from the Punjab Board and Cambridge University, to record the frequency of occurrences and the nature of critical-thinking practice exercises in these textbooks. Therefore, a comparison has been made between a local and an international curriculum for teaching English on the basis of critical thinking, as they are used for students of the same age group living in the same city but enrolled in different schools.

The reason for targeting Grade 4 English textbooks is that this is the age when a child enters the stage where the mode of thinking shifts from concrete to abstract (Angelo Fabio, 2023). Hence, the child naturally starts to think beyond what is taught and can ask questions beyond what is known.

1.1. Aim:

The aim of this research is to:

- Explore the nature and frequency of critical thinking exercises in each textbook.
- Deduce the extent to which critical thinking skills are developed through these exercises.
- Determine the pragmatic uses for which these exercises are given.
- Find the difference in educational outcomes after solving these questions and exercises.

2. Review of Literature:

Dr. Maria Montessori, in her book *The Absorbent Mind*, states that from birth to 6 years of age, children's minds are like sponges, as they absorb all the information and behavior around them. This ability to absorb information starts to shift toward logical reasoning when they grow into tweens (8-12 years old). Developing critical thinking skills shapes their individual thinking, affects their problem-solving, and decision-making abilities.

Fostering critical thinking in the early years feeds curiosity and opens new realms of knowledge for children, which increases the rate of their cognitive development. It enables them to think differently. This is because children can make judgments about the input they receive from their own perspective. Children in primary schools can develop critical thinking skills because they go through the "*Concrete Operational Stage*", a term coined by Jean Piaget in his Theory of *Cognitive*

Development, and their thinking abilities start to shift from being whimsically illogical to being logical and systematic. They get into the "*Dreaded why phase*" where they ask questions about everything and anything, including their beliefs, appearances, surroundings and every other aspect. This is the stage when they begin to develop critical thinking skills, so they should not be reprimanded for asking questions, but should be encouraged at home and in schools. As primary schools lay the foundations for cognitive thinking, the importance of fostering critical thinking should not be ignored.

The importance of critical thinking in education has been highlighted numerous times by numerous studies. (Facione, 2015) highlighted the importance of critical thinking by showing that critical thinking is further composed of skills like interpretation, analysis, evaluation, inference, explanation and self-regulation. (Tilak Raj, 2022) gave the importance of critical thinking, along with the stages of critical thinking, including unreflective, challenged, beginning, practical, progressive, and master thinker.

(Živković, 2016) highlighted the importance of critical thinking for success in the 21st century, which enables students to become effective communicators, dynamic thinkers, competent problem solvers and career experts.

However, studies demonstrating the significance of incorporating exercises that foster critical thinking into primary school syllabi remain scarce. This study highlights the importance of incorporating exercises that foster critical thinking and contrasts the nature and frequency of these exercises between PTB and Cambridge textbooks for teaching English.

2.1. Theoretical framework

This research will explore and analyze the exercises in PTB and Cambridge textbooks, with reference to the stages of Bloom's taxonomy. Bloom's taxonomy, developed in 1956 by Benjamin Bloom, has six stages showing cognitive skills. They included: Knowledge, Comprehension, Application, Analysis, Synthesis and Evaluation. However, in 2001, Anderson and Krathwohl modified it by using verbs instead of nouns and by designating the *Create stage* as the most complex.

The stages in revised Bloom's taxonomy by Anderson and Krathwohl (Wilson, 2001, 2005, 2013, 2016) include:

1. **Remember:** Recall the input by defining and explaining it.
2. **Understand:** Understanding the input by summarizing and paraphrasing the input in their own words.
3. **Apply:** Using learnt material in models or presentations.
4. **Analyze:** Analyzing the given information by applying the basic concepts of input in related and familiar situations by compare and contrast techniques.
5. **Evaluate:** Evaluating the input by making judgments about the quality.
6. **Create:** Synthesizing entirely new pieces of information by processing guidelines provided through input.

Categorization of LOT and HOT exercises under Bloom's stages

Types of exercises	Bloom's stages of Anderson 2001	Verbs
LOT	Remember	identify, recall, label, record, state, etc.
LOT	Understand	describe, explain, discuss, locate, restate, select, summarize, translate, etc.
LOT	Apply	apply, choose, calculate, demonstrate, illustrate, interpret, etc.
	Analyze	categorize, classify, compare, contrast, distinguish, examine, test, etc.
HOT		
HOT	Evaluate	choose, justify, defend, evaluate, rate, judge, conclude, predict, etc.
HOT	Create	build, compose, plan, write, invent, make, develop, construct, produce, etc.

Critical thinking exercises in PTB textbooks and Cambridge textbooks are viewed through the lens of stages of Bloom's taxonomy; they are classified as:

1. Higher order thinking (HOT) exercises
2. Lower order thinking (LOT) exercises

Lower-order thinking (LOT) exercises enhance foundational skills such as recalling facts, completing simple tasks, and understanding basic concepts from the provided input (Finansu, 2025). So, these might require the children to process the provided input and produce basic, related output. These exercises may include questions and answers, activities involving basic questions from the lesson, fill-in the blank exercises, and theoretical multiple-choice questions. The students just try to remember what they read and try to answer the questions. Critical thinking skills are primarily not challenged.

Lower-order exercises may also require students to apply the input they were exposed to in familiar situations; this may involve learning a grammar rule and then using it in different sentences. They may also be asked to summarize the input they receive in their own words.

So, stages of Bloom's taxonomy employed for lower-order LOT exercises include:

Remembering, Understanding and Applying information from given input.

Higher-order thinking (HOT) exercises, on the other hand, challenge children's critical thinking skills, prompting them to think beyond the given input. These foster the analysis, evaluation, and synthesis of new data (Finansu, 2025). These may include comparing the provided inputs using cognitive ability, judging the quality of the input, and creating new information using guidelines from the provided input, which are revolutionary exercises for young minds. HOT exercises develop their critical thinking, creative writing, and problem-solving skills. So, higher-order thinking exercises reinforce students to dive into the realm of critical thinking to a higher extent.

Therefore, the stages of Bloom's taxonomy employed for higher-order thinking (HOT) exercises include: *Analyzing, Evaluating and Synthesizing* information from given input.

It is worth mentioning that this study highlights stark differences between the curricula of Punjab Board textbooks (PTB) and Cambridge University textbooks, based on the frequency and nature of critical thinking exercises. It is found that PTB textbooks for the English language have integrated more LOT exercises than HOT ones. The HOT exercises in PTB textbooks do not extend far beyond the taught input. However, the Cambridge textbooks for teaching English have been found to gradually include HOT exercises in later chapters, alongside varied LOT

Liberal Journal of Language & Literature Review

Print ISSN: 3006-5887

Online ISSN: 3006-5895

exercises. The HOT exercises in Cambridge textbooks extend to a more pragmatic sense than those in PTB textbooks. These findings will be discussed later in this research.

Research questions:

1. What is the frequency of occurrence of LOT and HOT exercises for critical thinking integration in the PTB textbook for English language and Cambridge University's textbooks for English Language?
2. What is the nature of critical thinking exercises for cognitive development in the PTB textbooks as compared to the Cambridge University's textbooks for English language teaching? How are they different?
3. Which textbook fosters integrating critical thinking to a greater extent for pragmatic and communicative use of the English language in the students of Grade 4?

Methodology:

This study is a mixed-method research. It involves both quantitative and qualitative research. **Quantitative research** is carried out to examine the frequency of LOT and HOT exercises and is presented in a table, highlighting the total number of critical thinking integration exercises, followed by the numbers of LOT and HOT exercises in both PTB English textbooks and Cambridge University's English textbooks.

This study is **Qualitative research** as well, because it is conducted after content analysis to determine the nature of the critical thinking exercises for cognitive development in PTB English textbooks and Cambridge University's English textbooks,, respectively, followed by citing different examples from both books.

Sampling:

The sample for this research has been collected from the first 5 chapters of the Punjab Board Grade 4 English textbook and of Cambridge University's English textbook.

Data collection:

This research analyzes in detail the first 5 chapters of two English curriculum textbooks, i.e., the Punjab Textbook Board textbook and Cambridge University's textbook. In each chapter, every question is categorized into low-order thinking and high-order thinking exercises based on the stages of Bloom's taxonomy by observing the use of verbs in that particular question, as shown before in the table. The number of LOT and HOT exercises is calculated for each chapter and presented in a table in the findings section, comparing the frequencies across both books.

Findings and Data Analysis

In English textbooks, the nature of these critical-thinking exercises for cognitive development is analyzed. It is then followed by an analysis of the frequency of LOT and HOT exercises for integrating critical thinking skills in both books, while carefully examining the extent to which these exercises foster pragmatic and communicative use of the English language. Their occurrences are presented in the table below, which shows which textbook is more focused on integrating critical thinking skills.

	Punjab Curriculum and Textbook Board	Punjab Curriculum and Textbook Board	Punjab Curriculum and Textbook Board	Cambridge e Primary English	Cambridge e Primary English	Cambridge e Primary English
Chapter no.	Total Questions	Low Order Thinking	High Order Thinking	Total Questions	Low Order Thinking	High Order Thinking
1	23	17	6	25	17	8
2	22	13	9	26	14	12

Liberal Journal of Language & Literature Review

Print ISSN: 3006-5887

Online ISSN: 3006-5895

3	28	18	10	24	10	14
4	34	19	15	20	10	10
5	21	14	7	26	10	16
Total	128	81	47	121	61	60

The table shows the analysis of the five units from the two English books for grade 4, i.e., Punjab Curriculum and Textbook Board and Cambridge Primary English, based on an analysis of each question in these chapters. The PTB textbook reports that, out of 128 total questions across five chapters, 81 are Low Order Thinking questions, and 47 are High Order Thinking questions. On the other hand, in Cambridge Primary English for Grade 4, there are a total of 121 questions, of which 61 are Low Order Thinking questions, and 60 are High Order Thinking.

According to this, low-order thinking questions dominate the PTB book over high order ones, indicating less integration of critical thinking in textbooks than in the classroom. In contrast, we can see that there are almost equal numbers of low- and high-order thinking questions in the Cambridge textbook of the same grade, indicating a balance between the two categories. Compared to the PTB textbook, there seems to be greater integration of critical thinking in the Cambridge one. It is also found that, in this book, the Higher Order Thinking questions are much fewer in the first chapter than the LOTs. But as we move towards the second chapter, the ratio of HOTs increases compared to before. In the third chapter, there are more critical-thinking exercises than factual, memorization-based questions. In the fourth chapter, however, there is an equal number of LOT and HOT questions. In the fifth chapter, the ratio of LOT questions has decreased to a very low number. This presents a more manageable procedure of integrating critical thinking skills in students. Conversely, no such order is found in the PTB book. The ratio of Low Order Thinking questions across all chapters is higher than that of High Order Thinking questions.

The samples from the observed data are given below:

Punjab Curriculum and Textbook Board

High order thinking

1. Create a poem of your own using the given pairs of rhyming words and write it in your notebook.
2. Make a mind map about your favourite national hero in your notebook.
3. Select a little creature (e.g. honeybee) that is useful to humans. Note some interesting facts about it and share with your classmates.
4. Read any article on chocolate and note down its advantages and disadvantages in your notebook.

Low Order Thinking

1. Comprehension questions
2. Fill in the blanks with 'a', 'an' or 'the'
3. Punctuate the sentences.
4. Read the pie chart & answer questions.
5. Read given anagrams.

Cambridge Primary English

High Order Thinking

1. Choose a book for your partner from the school or class library. Ask your partner what they enjoy about stories.
2. Think about the setting.
3. Discuss how the setting is similar to or different from the area where you live. Include the weather conditions.
4. What comes to mind when you think of a shark? Share your thoughts with the class.
5. How can you tell the difference between fiction and nonfiction books? Which do you prefer? Why?

Low Order Thinking

1. Change regular verbs into the past tense by adding the suffix -ed to the root word.
2. Write each of these verbs in the past tense.
3. Explore sentences, phrases and key words. Decide if these are phrases or key words.

Discussion

The findings and analysis of the data found from both books show the two different standards provided to the students in the same grade, with the same age and cognitive level. According to Bloom's taxonomy, critical thinking can be achieved through three higher levels of thinking, i.e., analyze, evaluate, and create. However, these three levels are much fewer than the other three, i.e., remember, understand, and apply, in the PTB textbook. This means there are insufficient activities in the textbook to enhance critical thinking. One of the main reasons for this is the traditional teaching method (e.g., the Grammar-Translation Method), which focuses more on grammar learning through factual questions, fill-in the blank exercises, parts of speech, reading, vocabulary, etc. A smaller number of higher-order thinking questions indicates less focus on cognitive development and creative writing. With such a small number of critical and analytical activities, it is hard for students to develop the ability to create, compare, examine relationships, justify stances, make judgments, critique, and combine elements to form new structures. As PTB textbooks are taught in all public schools and some private schools, the government must consider the standards provided to students. The syllabus needs to shift from a traditional structure to a modern one by increasing the number of critical-thinking exercises. In this way, there would be an equal standard provided to both of the public and private sector students, enhancing their critical thinking skills.

On the other hand, there is a balance found in the Cambridge textbook. There are almost equal numbers of questions in both categories. However, the gradual increase in the number of Higher Order Thinking questions and, similarly, the decrease in the number of Lower Order Thinking questions as we move from the first chapter onwards show that there is more focus on developing students' cognitive abilities through a step-by-step process. It is taken into consideration that students do not feel the pressure to create structures themselves. Instead, they are first exposed to the factual question to understand and apply the rules first. This can help students gain confidence through a gradual process, so they start thinking critically, analyzing, and creating structures on their own more often.

This means that the syllabus is designed with the importance of integrating critical thinking skills among students in mind, along with understanding and memorizing the texts and grammar. Moreover, the activities related to critical and analytical thinking fulfil the objectives of Bloom's taxonomy, i.e., students will be able to analyze relationships, evaluate different situations, and create structures themselves at the end of the syllabus.

Conclusion

Textbooks are essential components of the curriculum in public and private schools and play a fundamental role in students' learning and cognitive development.

However, it is important to note whether textbooks provide such critical skills integrating exercises. So this study provides evidence that, for students of the same age group and cognitive level, there is a difference in the integration of critical thinking across two English textbooks. Such exercises are found to a very limited extent in PTB books, making it difficult for students to develop analytical and critical thinking skills. This syllabus seems designed to focus more on developing students' grammatical accuracy through repeated exercises on tenses, parts of speech, and vocabulary, making it more traditional textbook-like. However, the Cambridge Primary English seems to foster the development of critical thinking skills more among the students through the textbooks included in the curriculum. There is a gradual shift in the frequency patterns of LOT and HOT exercises as we progress through the chapters. Although they are almost equal in number at the end, there are still a considerable number of such exercises that can stimulate students' cognitive processes. At this frequency, students, by the end of the syllabus, would be able to analyze, evaluate, and create structures themselves and use the English language more effectively. Moreover, the exercises, along with being more numerous, are of high quality, encouraging students to apply what they learn in daily life.

Recommendations

After conducting this research, it is recommended that schools choose textbooks after analyzing whether they can develop critical thinking skills among students and whether they align with the curriculum set for them. In the future, further research can analyze textbooks from additional publishers and boards across different grades to

Liberal Journal of Language & Literature Review

Print ISSN: 3006-5887

Online ISSN: 3006-5895

determine which textbooks are most suitable in this regard. This can also be done on other subjects besides English. It is also recommended to conduct research on how the same textbooks are taught in different schools and what impact this has on students' critical thinking.

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