

Exploring Integration of Higher-Order Thinking Skills in Primary-Level English Textbooks: A Comparative Study of Sindh (Pakistan) and India

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ABSTRACT

This study investigates the integration of Higher-Order Thinking Skills (HOTS) in primary-level English textbooks from Sindh (Pakistan) and India, focusing on Classes III to V. Using a quantitative content analysis approach, all post-reading exercises and questions were categorized into Lower-Order Thinking Skills (LOTS) and HOTS, with the latter further classified into Analysis, Synthesis, Evaluation, and Mixed HOTS based on Bloom's Taxonomy. Findings indicate that Sindh's textbooks predominantly emphasize LOTS (71%), with HOTS accounting for only 29%, heavily favoring Synthesis and underrepresenting Evaluation. Alignment analysis reveals inconsistencies between textbook exercises and curriculum Student Learning Outcomes (SLOs), particularly in Analysis and Evaluation, indicating gaps in promoting evaluative and decision-making skills. In contrast, Indian textbooks demonstrate a stronger and more balanced integration of HOTS (62%), with systematic distribution across cognitive domains and inclusion of Mixed HOTS tasks that foster multi-domain engagement. The study highlights the need for strategic enhancement of Sindh's textbooks to better align with SLOs and promote comprehensive cognitive development in primary learners.

Keywords: Higher-Order Thinking Skills, HOTS, English textbooks, Primary Education, Sindh, India, Bloom's Taxonomy, Curriculum Alignment

INTRODUCTION

In today's knowledge-driven world, the development of Higher-Order Thinking Skills (HOTS) in students is widely recognized as essential for fostering critical thinking, creativity, problem-solving, and decision-making abilities (Bloom, 1956; Anderson & Krathwohl, 2001). HOTS engage learners beyond memorization, requiring them to analyze, synthesize, evaluate, and apply knowledge in meaningful contexts (Tomlinson, 2003; Piaget, 1972). At the primary level, English textbooks serve not only to develop language proficiency but also to provide structured opportunities for learners to engage in higher-order cognitive processes, laying a foundation for lifelong learning and intellectual growth (Cunningsworth, 1995; Sheldon, 1988).

Research in Pakistan, particularly in Sindh, indicates that primary English textbooks predominantly emphasize Lower-Order Thinking Skills (LOTS), such as recall and comprehension, while HOTS-related exercises remain limited (Saeed, 2025; Tajamal & Shakur, 2022; Ahmed et al., 2023). This over-reliance on LOTS constrains students' ability to critically analyze texts, evaluate information, and creatively synthesize ideas, which may hinder their cognitive development. In contrast, studies from India suggest a more balanced integration of HOTS in primary English textbooks, where exercises frequently target analysis, evaluation, and creative thinking (Chavda et al., 2023; Jha, 2023;

Viswanathan & Sahana, 2011). Despite these observations, there is a lack of systematic comparative research examining the extent, nature, and alignment of HOTS integration in Sindh's and Indian primary English textbooks.

Textbooks play a central role in shaping instructional practices, particularly in contexts where teachers rely heavily on prescribed materials for lesson planning and assessment (Cunningsworth, 1995; Tomlinson, 2003). If textbooks focus predominantly on factual recall, they restrict opportunities for analytical reasoning, interpretation, and creative expression (Sheldon, 1988; Panezai & Channa, 2017). Moreover, alignment between textbook exercises and curriculum-specified Student Learning Outcomes (SLOs) is critical to ensure that students engage with tasks reflecting intended cognitive objectives (National Council of Educational Research and Training [NCERT], 2017; Pervez et al., 2022).

Given the importance of early cognitive scaffolding for long-term academic trajectories (Vygotsky, 1978; Piaget, 1972), this study seeks to examine the integration of HOTS in post-reading exercises of primary English textbooks from Sindh and India for Classes III to V. Additionally, it explores the alignment of Sindh's textbooks with curriculum SLOs to assess whether the intended cognitive outcomes are adequately represented. By applying Bloom's Taxonomy as a framework for analysis, the study investigates which cognitive domains are emphasized, the progression of HOTS across grades, and the differences and similarities between the two educational contexts. This research contributes to understanding how textbook design influences higher-order cognitive development and informs curriculum and instructional reforms aimed at fostering critical thinking skills in primary learners.

REVIEW OF THE LITERATURE

This section reviews existing research on the integration of Higher-Order Thinking Skills (HOTS) in curriculum documents and English textbooks at the primary level, with particular focus on Pakistan and India (Ahmed et al., 2023; Chavda et al., 2023; Saeed, 2025). Drawing upon the cognitive framework proposed by Benjamin Bloom (1956), the review examines how textbooks and assessment practices reflect different levels of cognitive demand, especially analysis, synthesis, and evaluation (Anderson & Krathwohl, 2001; Viswanathan & Sahana, 2011). It highlights key empirical studies (Tajamal & Shakur, 2022; Jha, 2023; Panezai & Channa, 2017), identifies patterns in the distribution of lower- and higher-order thinking skills, and establishes the research gap that justifies the present comparative investigation of Sindh and Indian primary English textbooks.

Textbooks and Cognitive Development in Primary Education

Textbooks play a central role in shaping classroom instruction, particularly in contexts where teachers rely heavily on prescribed materials for lesson planning and assessment preparation. In many developing education systems, textbooks effectively become the enacted curriculum, determining not only what is taught but also how students are expected to think and respond. As noted by Cunningsworth (1995), textbooks provide the framework for language presentation, practice, and skill development. Similarly, Sheldon (1988) argues that textbooks exert substantial pedagogical influence and must therefore be critically evaluated.

From a materials development perspective, Tomlinson (2003) emphasizes that instructional materials should be evaluated not only for content accuracy but also for their impact on learners' cognitive and affective engagement. If textbooks predominantly promote factual recall and literal comprehension, they restrict opportunities for analytical reasoning, interpretation, and creative expression. This issue is particularly critical at the primary level, where early cognitive scaffolding shapes long-term academic trajectories.

Theoretical Foundations of Higher-Order Thinking Skills (HOTS)

The concept of Higher-Order Thinking Skills (HOTS) originates from the cognitive taxonomy developed by Benjamin Bloom (1956). Bloom's taxonomy categorized cognitive processes into six hierarchical levels: Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation. The upper levels—Analysis, Synthesis, and Evaluation—require learners to manipulate, reorganize, and critically assess information rather than merely recall it.

The taxonomy was later revised by Lorin Anderson and David Krathwohl (2001), who re-conceptualized the categories as active cognitive processes: Remember, Understand, Apply, Analyze, Evaluate, and Create. In this revised model, "Create" replaced "Synthesis" and was positioned at the highest level of cognitive complexity. The revision also introduced a knowledge dimension, distinguishing between factual, conceptual, procedural, and metacognitive knowledge.

Constructivist learning theory provides philosophical grounding for HOTS, asserting that meaningful learning occurs when learners actively construct and apply knowledge. Thus, analysis, evaluation, and creation are not supplementary skills but essential components of deep learning. Educational reforms worldwide increasingly emphasize the integration of HOTS to prepare learners for complex problem-solving and critical engagement in contemporary society.

Textbook Evaluation and Content Analysis

Systematic textbook evaluation has long been recognized as necessary for ensuring pedagogical effectiveness. Cunningsworth (1995) proposed evaluative criteria focusing on language content, skill balance, and learner engagement. Sheldon (1988) stressed the importance of contextual appropriateness and adaptability. McGrath (2002) further distinguished between pre-use, in-use, and post-use evaluation frameworks.

In contemporary research, content analysis has become a dominant methodological tool for evaluating textbooks. According to Klaus Krippendorff (2013), content analysis enables systematic, objective, and replicable examination of textual materials. When integrated with Bloom's taxonomy, this method allows researchers to classify exercises and questions according to cognitive levels. Such analyses provide empirical evidence regarding whether textbooks genuinely foster higher-order thinking or merely reinforce memorization.

Higher-Order Thinking Skills (HOTS) in the Indian Context

Research conducted in India demonstrates an increasing scholarly focus on the integration of Higher-Order Thinking Skills (HOTS) in curriculum design, textbook development, and assessment practices. However, findings consistently indicate a tension between policy aspirations and classroom realities.

A comparative-analytical study by Qizi (2024) examined older and newer editions of primary school textbooks, analyzing curriculum standards, pedagogical strategies, and alignment with contemporary educational goals. The findings suggest that revised textbooks attempt to reflect modern learner-centered objectives; however, challenges remain in balancing traditional knowledge transmission with innovative, inquiry-based learning approaches. The study highlights the importance of continuous textbook reform to enhance student performance and adapt to evolving educational demands.

The theoretical grounding of HOTS in India frequently draws upon Bloom's Taxonomy. Jha (2023) emphasizes that Bloom's cognitive hierarchy—from remembering to creating—provides a structured framework for aligning instructional strategies and assessments with Course Outcomes (COs) and Program Outcomes (POs). By mapping learning tasks and evaluation methods onto cognitive levels, educators can progressively develop learners' analytical and creative capacities. The study underscores

the taxonomy's utility in ensuring measurable and hierarchical cognitive development within organized educational systems.

Empirical evaluations of English language teaching (ELT) materials reveal mixed levels of HOTS integration. Chavda et al. (2023) analyzed NCERT and CBSE English textbooks alongside CBSE examinations to assess the development of second-language (L2) writing skills through HOTS. Using descriptive and content analysis methods grounded in the Revised Bloom's Taxonomy, the researchers found significant misalignment between intended learning outcomes and assessment practices. While curricular documents emphasize higher-order competencies, examination questions frequently fail to reflect these expectations, thereby limiting opportunities for meaningful cognitive engagement in ESL writing.

Similar patterns appear in discipline-specific research. Narayanan and Adithan (2015), examining engineering faculty practices, observed that most examination questions focused on content coverage rather than higher-order cognitive engagement. Faculty members demonstrated limited awareness of Bloom's cognitive levels, which resulted in assessments dominated by Lower-Order Thinking Skills (LOTS). The authors advocate a shift toward inductive, student-centered instruction that systematically integrates HOTS.

At the school level, Boral et al. (2025) conducted a Bloom-based analysis of mathematics learning outcomes across elementary and secondary grades in India. The findings revealed a strong predominance of LOTS—particularly remembering and understanding—while analyzing, evaluating, and creating were minimally represented. This imbalance suggests a discrepancy between policy rhetoric promoting critical thinking and the cognitive demands embedded in curricular documents.

Experimental research further illustrates the potential for enhancing HOTS through deliberate textbook modification. Viswanathan and Sahana (2011) analyzed elementary-level textbook questions and found that most were aligned with lower-order cognitive levels. After reformulating selected questions to target analysis, evaluation, and creation, they tested these revised tasks among Grade 3 and 4 students. The results demonstrated that students could manage higher-level questions when appropriately scaffolded, suggesting that cognitive rigor can be cultivated even at early educational stages.

In secondary English education, Chauhan et al. (2023) investigated the extent of critical thinking integration in NCERT textbooks (Classes 8–10). Through quantitative content analysis of 326 exercise questions using the Revised Bloom's Taxonomy and Wolfe's Argumentation Model, the study found that analytical tasks constituted approximately 43% of activities, while understanding-based tasks accounted for about 26%. However, tasks requiring application and creation were extremely limited. Although partial attention is given to analysis, opportunities for creative and real-life problem-solving remain scarce.

Teacher-related research also highlights systemic challenges. Gupta and Mishra (2021), through focus group discussions with secondary school teachers in Mizoram, found conceptual confusion regarding HOTS, insufficient pedagogical training, and curricular constraints as key barriers to implementation. Although teachers acknowledged the effectiveness of strategies such as project-based learning, debates, and cooperative learning, limited professional development hindered consistent practice. Similarly, Jayalakshmi and Biswal (2023) demonstrated that open-book assessment environments for pre-service teachers enhanced analytical and critical thinking skills, indicating that assessment reform can positively influence cognitive development.

Collectively, Indian research indicates growing awareness of HOTS integration; however, textbook content and assessment systems often remain dominated by lower-order cognitive demands, reflecting partial implementation of reform agendas.

Higher-Order Thinking Skills (HOTS) in Pakistan

Research in Pakistan reveals similar concerns regarding the dominance of rote learning and limited higher-order cognitive engagement across subjects and grade levels.

Saeed (2025) critically examined the implementation of Bloom's Taxonomy in Pakistani schools and identified systemic barriers such as traditional teaching methods, examination-oriented practices, and policy gaps. The study argues that meaningful integration of HOTS requires comprehensive reform in curriculum design, teacher training, and assessment structures.

At the primary level, Panezai and Channa (2017) explored teachers' perceptions of English textbooks (Grades 1–5) in Balochistan. Although teachers moderately approved of textbook utility, they reported concerns related to limited teacher training, inadequate resources, and insufficient vocabulary and grammar presentation. These challenges indirectly affect the implementation of higher-order instructional strategies.

Several content analyses reveal a strong predominance of LOTS in English and other subjects. Tajamal and Shakur (2022) found that only 7.5% of tasks in Punjab HSSC English textbooks reached the analyzing level, 5.4% reached evaluating, and none targeted creating. Similarly, Ahmed et al. (2023), analyzing primary English textbooks under the Single National Curriculum (SNC), reported that approximately 89.8% of textbook activities targeted LOTS, while only 10.2% reflected HOTS. This disproportionate distribution indicates limited emphasis on critical and creative thinking in primary education.

Studies in social sciences and citizenship education further highlight deficiencies. Naseer et al. (2020, 2022) reported that Pakistan Studies textbooks predominantly contained lower-order questions, with minimal representation of analytical or evaluative tasks. Awan et al. (2018) and Hina et al. (2011) similarly concluded that citizenship education materials inadequately promote reflective and critical engagement, emphasizing factual knowledge over inquiry-based learning.

In science and mathematics education, misalignment between curriculum intentions and assessment practices has been documented. Gulzar and Mahmood (2018) found that the majority of mathematics Student Learning Outcomes (SLOs) were categorized at Webb's Depth of Knowledge Level 1 (recall), with negligible representation of strategic or extended thinking. Pervez et al. (2022) identified a stronger presence of HOTS in intended curriculum documents than in examination papers, revealing gaps between policy design and actual assessment.

Research examining cognitive development across school systems further supports these findings. Durrani and Choudhary (2020) found significant differences in higher-order reasoning abilities among students from private, public, and madrassah systems, suggesting that curriculum quality, teacher training, and instructional resources influence cognitive outcomes.

HOTS in Sindh

Within Sindh, empirical research on HOTS integration remains limited but revealing. Shaikh and Memon (2021) analyzed 260 reading comprehension questions from Grade 10 English textbooks published by the Sindh Textbook Board and Oxford Progressive English. Their findings showed that 100% of comprehension questions in the Sindh Textbook Board textbook targeted the remembering level, whereas the Oxford textbook demonstrated a slightly broader distribution, including some analytical and evaluative tasks. None of the textbooks incorporated creation-level questions.

Assessment-based studies further confirm this pattern. Zamir and Jan (2023) and Chandio et al. (2016) analyzed Secondary School Certificate (SSC) examination papers in Sindh and found overwhelming

dominance of lower-order cognitive questions, particularly at the remembering level. Higher-order levels such as analyzing, evaluating, and creating were either minimally represented or entirely absent. These findings suggest that examination structures reinforce rote memorization, influencing textbook design and classroom instruction.

Comparative Research and Identified Gap

Although numerous comparative studies have examined Pakistani and Indian textbooks, most have focused on historical narratives, national identity construction, gender representation, or ideological discourse (Joshi, 2010; Moonaka & Nadeem, 2017; Rosser, 2003; Saher, 2023; Jabeen et al., 2014). These analyses provide valuable sociocultural insights but do not systematically evaluate cognitive demand using frameworks such as Bloom's Taxonomy. Existing research across Pakistan and India consistently reveals:

- Dominance of LOTS over HOTS in textbooks and examinations.
- Misalignment between curricular objectives and assessment practices.
- Limited teacher preparedness for HOTS-oriented instruction.
- Inconsistent distribution of higher-order cognitive tasks.

However, there is a clear absence of comparative studies specifically analyzing primary-level English textbooks (Classes III–V) in Sindh (Pakistan) and India with explicit reference to HOTS and curriculum alignment.

Research Gap

Despite extensive research on textbook evaluation, gender representation, subject-specific cognition, and secondary-level curriculum analysis, no study has systematically compared the integration of Higher-Order Thinking Skills in primary English textbooks of Sindh and India against their respective curricular objectives. Particularly, empirical investigation of alignment between Student Learning Outcomes (SLOs) and post-reading exercises at the primary level remains scarce.

Therefore, the present study addresses this critical gap by conducting a comparative content analysis of English textbooks (Classes III–V) in Sindh and India, focusing on the level of HOTS integration and the alignment between textbook tasks and curriculum SLOs. This contribution is significant for strengthening cognitive rigor in early English language education and informing future curriculum reform initiatives.

Research Questions

The study aims to address following two main research questions:

Research Question No.1: What is the level of integration of HOTS in the post-reading material, exercises, questions in Sindh's and Indian English textbooks in class III to V?

Research Question No.2: How aligned are Sindh's English textbooks from class III to V with SLOs in context of HOTS?

Research Objectives

Research Objective 1: To investigate the integration of HOTS in the post-reading material / exercises / questions in the Sindh's and Indian English textbooks for Class III to V.

Research Objective 2: To explore alignment of HOTS present Sindh's English textbooks for Class III to V and the curriculum SLOs

Research Methodology and Design

The present study employed a quantitative descriptive research design using content analysis as the primary method of investigation. Since the purpose of the study was to examine the level of integration of Higher-Order Thinking Skills (HOTS) in primary-level English textbooks and to explore alignment with curriculum Student Learning Outcomes (SLOs), quantitative content analysis was considered appropriate. This design enabled systematic identification, classification, and quantification of cognitive levels embedded in post-reading materials, exercises, and questions.

Population and Sample

The population of the study consisted of primary-level English textbooks prescribed for Classes III to V in Sindh (Pakistan) and India. The sample included the officially prescribed English textbooks for these grades published by the respective textbook authorities. All post-reading questions, exercises, and activities included in the selected textbooks were analyzed. No sampling of exercises was undertaken; rather, a comprehensive analysis of all relevant tasks was conducted to ensure accuracy and reliability.

Instrumentation and Coding Framework

The analytical framework of the study was based on the Original Bloom's Taxonomy developed by Benjamin Bloom. For operationalization, the study adopted Bloom's Taxonomy of Measurable Verbs as adapted by Utica University (n.d.).

The measurable verbs associated with each cognitive level—Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation—served as coding indicators. Each question or task in the post-reading sections was carefully examined to identify its dominant action verb and corresponding cognitive demand. Based on this identification, tasks were categorized into one of the six cognitive levels.

Lower three levels (Knowledge, Comprehension, and Application) were classified as Lower-Order Thinking Skills (LOTS), while the upper three levels (Analysis, Synthesis, and Evaluation) were categorized as Higher-Order Thinking Skills (HOTS). This classification enabled systematic measurement of cognitive distribution across textbooks.

Data Collection Procedure

The data collection process involved the following steps:

1. **Identification of Tasks:** All post-reading exercises, comprehension questions, and related activities from Classes III to V English textbooks were extracted.
2. **Verb Identification:** Each task was examined to determine the measurable verb indicating its cognitive level.
3. **Categorization:** Tasks were coded according to Bloom's six cognitive categories using the measurable verb framework.
4. **Verification:** To maintain consistency, coding decisions were reviewed to ensure that each task was classified according to its primary cognitive demand.

Data Quantification and Analysis

After categorization, the data were quantified in numerical form. The frequency of tasks under each cognitive level was calculated separately for Sindh and Indian textbooks. These frequencies were then converted into percentages to determine the proportional distribution of LOTS and HOTS within each textbook series.

To address the second research objective, alignment analysis was conducted. The frequency of cognitive levels identified in the textbooks was compared with the frequency and emphasis of HOTS reflected in the prescribed curriculum SLOs. This comparison enabled the examination of whether textbook exercises corresponded with the cognitive expectations outlined in curriculum documents. Alignment was assessed by analyzing similarities or discrepancies between the proportion of higher-order cognitive verbs in SLOs and their representation in textbook tasks.

Data Presentation

The quantified data were presented in tabular and percentage formats to facilitate comparison between Sindh and Indian textbooks. The analysis focused on:

- Overall distribution of LOTS and HOTS
- Frequency of Analysis, Synthesis, and Evaluation levels
- Comparative percentage differences between the two contexts
- Degree of alignment between textbook exercises and curriculum SLOs

DATA ANALYSIS

This section presents a detailed analysis of the integration of Higher-Order Thinking Skills (HOTS) in post-reading exercises of English textbooks for Classes III to V in Sindh and India. The data were identified and categorized using Bloom's Taxonomy of Measurable Verbs, as adapted by Utica University (n.d.), and quantified into frequencies and percentages. The analysis focuses on two broad categories—Lower-Order Thinking Skills (LOTS) and HOTS—and further dissects HOTS into its three cognitive domains: Analysis, Synthesis, and Evaluation, including mixed activities that combine multiple HOTS levels. Data for Sindh and Indian textbooks are presented sequentially, followed by a comparative analysis, enabling a clear understanding of the differences and trends in the incorporation of cognitive skills across the two contexts. The data extracted from post-reading exercises of textbooks related to LOTS, HOTS, and further levels of HOTS has been presented in the following tables:

Table 1

Frequency and Percentage for Class III to Class V: Presence of LOTS and HOTS

Sindh			
Description of Data	LOTS	HOTS	No. of Qs
My English III	146 (85%)	25 (15%)	171 (100%)
My English IV	112 (70%)	49 (30%)	161 (100%)

My English V	71 (55%)	58 (45%)	129 (100%)
Grand Total	329 (71%)	132 (29%)	461 (100%)

Table 2

Frequency and Percentage for Class III to Class V: HOTS Levels

Sindh					
Description of Data	Analysis	Synthesis	Evaluation	Mix HOTS	No. of Qs
My English III	10 (40%)	13 (52%)	2 (8%)	0 (0%)	25 (100%)
My English IV	22 (45%)	23 (47%)	0 (0%)	4 (8%)	49 (100%)
My English V	3 (5%)	41 (71%)	6 (10%)	8 (14%)	58 (100%)
Grand Total	35 (27%)	77 (58%)	8 (6%)	12 (9%)	132 (100%)

Table 3

Frequency and Percentage for Class III to Class V: Presence of LOTS and HOTS

India			
Description of Data	LOTS	HOTS	No. of Qs
Santoor 3	71 (48%)	77 (52%)	148 (100%)
Marigold 4	42 (29%)	102 (71%)	144 (100%)
Marigold 5	67 (38%)	111 (62%)	178 (100%)
Grand Total	180 (38%)	290 (62%)	470 (100%)

Table 4

Frequency and Percentage for Class III to Class V: HOTS Levels

India					
Description of Data	Analysis	Synthesis	Evaluation	Mix HOTS	No. of Qs
Santoor 3	15 (19%)	39 (51%)	16 (21%)	7 (9%)	77 (100%)

Marigold 4	39 (38%)	34 (33%)	23 (23%)	6 (6%)	102 (100%)
Marigold 5	43 (39%)	44 (40%)	21 (19%)	3 (3%)	111 (100%)
Grand Total	97 (33%)	117 (40%)	60 (21%)	16 (6%)	290 (100%)

Integration of HOTS in Post-Reading Exercises: This section presents an in-depth analysis of Higher-Order Thinking Skills (HOTS) in post-reading exercises of English textbooks for Class III to V in Sindh and India. The analysis aims to examine the extent, nature, and cognitive focus of HOTS-related questions and to compare patterns across both contexts. The data was identified and classified using Bloom's Taxonomy of Measurable Verbs as adapted by Utica University (n.d.), categorized into Lower-Order Thinking Skills (LOTS) and Higher-Order Thinking Skills (HOTS). HOTS questions were further subdivided into Analysis, Synthesis, Evaluation, and Mix HOTS, and quantified in terms of frequency and percentage.

Sindh English Textbooks

The post-reading exercises in Sindh's English textbooks (My English III–V) indicate a strong predominance of LOTS questions across all grades. In total, 71% of questions (329 out of 461) focused on LOTS, while HOTS accounted for only 29% (132 questions). At the class level, Class III (My English III) shows the greatest reliance on LOTS, with 85% of questions targeting memory-level tasks and only 15% engaging HOTS. A gradual increase in HOTS is observed in Class IV (My English IV), where 30% of questions require higher-order thinking, and Class V (My English V), which contains 45% HOTS-related questions. This pattern reflects a slow but progressive inclusion of cognitive challenges, though LOTS remain the main focus of the textbook developers.

Regarding the distribution of HOTS categories, Synthesis dominates with 58% of all HOTS questions, followed by Analysis at 27%, while Evaluation remains minimal at 6%. Mixed HOTS questions, involving more than one cognitive process simultaneously, account for 9% of the HOTS content and appear only in Classes IV and V. Class III contains a very limited number of HOTS questions (25 in total), primarily focusing on Synthesis (52%) and Analysis (40%), with only 8% targeting Evaluation. Example activities for Analysis include tasks such as identifying incorrect supporting sentences or sequencing events, whereas Synthesis tasks involve developing stories or writing paragraphs from outlines. Evaluation questions, though limited, ask students to reflect on personal experiences or make decisions based on given scenarios. Mixed HOTS activities, such as "List rhyming words from a poem and add one," require students to analyze and synthesize simultaneously, fostering multi-domain cognitive engagement. Overall, Sindh textbooks display gradual integration of HOTS, with a strong emphasis on Synthesis, but evaluative reasoning and multi-domain thinking remain underrepresented.

Indian English Textbooks

In contrast, Indian primary textbooks (Santoor 3 and Marigold 4–5) demonstrate a stronger and more consistent integration of HOTS. Across Classes III to V, 62% of post-reading questions target HOTS, surpassing LOTS, which account for 38%. Class III (Santoor 3) presents a relatively balanced distribution with 52% HOTS questions. Class IV (Marigold 4) emphasizes HOTS even more, comprising 71% of post-reading questions, while Class V (Marigold 5) maintains 62% HOTS content. This indicates that Indian textbook developers prioritize cognitive engagement and critical thinking skills from the early grades.

The distribution of HOTS categories in Indian textbooks shows that Synthesis remains the most prominent cognitive domain (40%), closely followed by Analysis (33%) and Evaluation (21%). Mixed

HOTS questions constitute 6% overall, encouraging students to engage in multiple cognitive processes simultaneously. Class III exercises in Santoor 3 highlight Synthesis (51%) through tasks like imaginative storytelling and idea generation, while Analysis (19%) focuses on classification, sequencing, and reasoning activities. Evaluation questions (21%) involve decision-making and reflective thinking, such as justifying opinions based on evidence from stories. In Class IV (Marigold 4), the distribution of HOTS is more balanced, with Analysis at 38%, Synthesis at 33%, and Evaluation at 23%, illustrating a systematic approach to cognitive skill development. Class V (Marigold 5) maintains this trend with Analysis (39%), Synthesis (40%), and Evaluation (19%), engaging students in analytical, creative, and judgment-based tasks. Mixed HOTS exercises, such as “Imagine life without the Sun – discuss consequences,” require students to analyze a scenario, synthesize knowledge, and evaluate outcomes concurrently.

Comparative Analysis: Sindh and Indian Textbooks

When comparing Sindh and Indian textbooks, Indian textbooks consistently include a greater number of HOTS questions across all grades. For Class III, Santoor 3 contains 77 HOTS-related questions compared to only 25 in My English III, reflecting a 208% higher inclusion in India. The difference is particularly striking in Evaluation tasks, where Class III Sindh textbooks include only 2 questions, while Indian textbooks have 16, marking a 700% difference. Class IV shows similar trends, with Marigold 4 containing 102 HOTS questions compared to 49 in My English IV, and a complete absence of Evaluation tasks in Sindh textbooks versus 23 in Indian textbooks. At Class V, Marigold 5 contains 111 HOTS questions against 58 in My English V, with notable differences in Analysis (43 vs. 3 questions, 1333% higher) and Evaluation (21 vs. 6 questions, 250% higher). Interestingly, Sindh textbooks contain slightly more Mixed HOTS activities in Class V (8 vs. 3), indicating some engagement with multi-domain cognitive tasks.

Overall, the comparative analysis highlights that Indian textbooks not only integrate a higher quantity of HOTS questions but also maintain a balanced progression across Analysis, Synthesis, and Evaluation, ensuring systematic development of critical thinking skills. Sindh textbooks show gradual progression in HOTS, dominated by Synthesis, with Analysis and Evaluation underrepresented. While Mixed HOTS activities are emerging in Sindh textbooks, their overall frequency is limited. The data suggest that Sindh textbooks require strategic enhancement to provide students with a more comprehensive cognitive challenge, particularly in analytical and evaluative reasoning.

Alignment of SLOs with Sindh’s Textbooks

In order to address the second research question and objective. The data was further investigated to check the alignment of SLOs from curriculum with English textbooks being taught at primary schools from Class III to V. The following related to SLOs along with textbook’s frequency of HOTS has been presented in the following table:

Table 5

Alignment of SLO’s Emphasis with Sindh’s Textbooks Data from Class III to V

Class	HOTS Level	SLO Emphasis	Textbook Frequency	Alignment Level
III	Analysis	Strong	10	Moderate
	Synthesis	Weak	13	Misaligned (Over-represented)

	Evaluation	Strong	2	Weak
IV	Analysis	Strong & overly emphasized	22	Strong
	Synthesis	Adequate	23	Strong
	Evaluation	Adequate	0	Not aligned
	Mix HOTS	Not specified	4	Adequate
V	Analysis	Strong & overly emphasized	3	Strongly Misaligned
	Synthesis	Strong	41	Strong
	Evaluation	Adequate	6	Moderate
	Mix HOTS	Not specified	8	Adequate

Table 5 presents the alignment of the post-reading HOTS activities in Sindh's English textbooks (Classes III to V) with the corresponding Student Learning Outcomes (SLOs). The table shows the frequency of questions at each HOTS level and the extent to which they match the intended SLO emphasis.

Class III: At the Analysis level, SLO emphasis is strong, and the textbook contains 10 related questions, indicating moderate alignment. For Synthesis, the SLO emphasis is weak, but textbooks include 13 questions, which is misaligned (over-represented), suggesting that students are being asked to perform more synthesis than expected. Evaluation, despite a strong SLO emphasis, is addressed with only 2 questions, indicating weak alignment. This shows an imbalance between intended outcomes and textbook exercises at Class III.

Class IV: Analysis is noted as strongly emphasized and overly represented in the textbook with 22 questions, resulting in strong alignment. Synthesis has an adequate SLO emphasis and 23 textbook questions, indicating strong alignment. Evaluation, though adequately emphasized in SLOs, is missing in the textbook, showing it is not aligned. Mix HOTS, though not specified in SLOs, is adequately represented with 4 questions, reflecting a positive addition beyond prescribed outcomes.

Class V: Analysis is strongly emphasized in the SLOs, but the textbook contains only 3 questions, resulting in strongly misaligned content. Synthesis shows both strong SLO emphasis and 41 textbook questions, indicating strong alignment. Evaluation, with adequate SLO emphasis, is represented with 6 questions, showing moderate alignment. Mix HOTS, not specified in SLOs, is adequately included with 8 questions, providing additional cognitive engagement.

The alignment between Sindh's textbooks and SLOs shows a mixed pattern. While Synthesis is generally well-aligned across all grades, Analysis is inconsistently represented—overemphasized in some grades (Class IV) and underrepresented in others (Class V). Evaluation is consistently underrepresented in textbooks relative to SLO emphasis, particularly at Class III and IV, indicating a gap in fostering judgment and decision-making skills. Mix HOTS activities, although not specified in SLOs, provide some enhancement to cognitive engagement, suggesting a partial attempt to incorporate higher-level thinking skills beyond prescribed outcomes.

In general, Sindh's textbooks show partial alignment with SLOs. Synthesis activities align well with intended learning outcomes, while Analysis and Evaluation exhibit inconsistencies and misalignments. This suggests that while the textbooks attempt to promote HOTS, more deliberate inclusion of Analysis

and Evaluation tasks is required to fully achieve SLO expectations, particularly to strengthen critical thinking and decision-making skills among learners.

CONCLUSION

This study compared the integration of Higher-Order Thinking Skills (HOTS) in primary-level English textbooks from Sindh (Pakistan) and India for Classes III to V. Findings reveal that Sindh's textbooks heavily emphasize Lower-Order Thinking Skills (LOTS), with HOTS comprising only 29% of post-reading exercises. Within HOTS, Synthesis dominates, while Evaluation is consistently underrepresented, and Mixed HOTS tasks appear minimally in higher grades. Alignment analysis shows inconsistencies with curriculum SLOs, particularly in Analysis and Evaluation, highlighting gaps between intended learning outcomes and textbook content.

In contrast, Indian textbooks demonstrate a balanced and systematic integration of HOTS, with 62% of post-reading questions targeting higher-order cognition. Analysis, Synthesis, and Evaluation are well-distributed, and Mixed HOTS tasks encourage multi-domain cognitive engagement. Comparative results underscore that Indian textbooks provide richer opportunities for critical thinking, problem-solving, and evaluative reasoning. The study suggests that Sindh's textbooks require strategic enhancement of HOTS, particularly in Evaluation and multi-domain tasks, to achieve better alignment with SLOs and support holistic cognitive development.

Ethical Considerations

The study relied exclusively on publicly available curriculum documents and textbooks. No human participants were involved; therefore, no ethical risk was associated with data collection. Proper acknowledgment of textbook boards and the adopted verb taxonomy framework was maintained.

Funding Declaration

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