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ANALYSING THE ALIGNMENT OF SINGLE NATIONAL CURRICULUM (SNC) 2022 AND ENGLISH TEXTBOOK OF GRADE 4 THROUGH THE LENS OF BLOOM'S TAXONOMY

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ABSTRACT

The purpose of this research was to examine the alignment of the Single National Curriculum 2022 of English with the Textbooks published by the Khyber Pakhtunkhwa Textbook Board for Grade 4 focusing on the Specification of student Learning Objectives (SLOs) pertaining to competencies (Oral Communication, Reading & Critical thinking, Vocabulary & Grammar and Writing) through the Lens of cognitive level of Bloom's Taxonomy. In this study a Quantitative based Document Analysis was used as a research design. For data analysis, the survey of the enacted curriculum method (SEC) was used to measure the degree of alignment between the curriculum and textbook about SLOs with respect to each selected competency. Using the alignment index method provided by Porter (2002), a quantitative measure of alignment for each competence was obtained and the results was compared to cognitive levels of Bloom's Taxonomy. Overall with Alignment Index it was found that there is misalignment between the SLOs based competences of curriculum and textbooks from Grade 4 with regard to Cognitive Domain of bloom taxonomy. In other words, all the sub-levels of the Cognitive Domain are present but their order is random. This misalignment was not same for all the competences.

Keywords: Curriculum, Textbook, Student Learning Outcomes, Competencies, Oral Communication, Reading & Critical thinking, Vocabulary & Grammar, Writing. Cognitive Domain, Bloom taxonomy

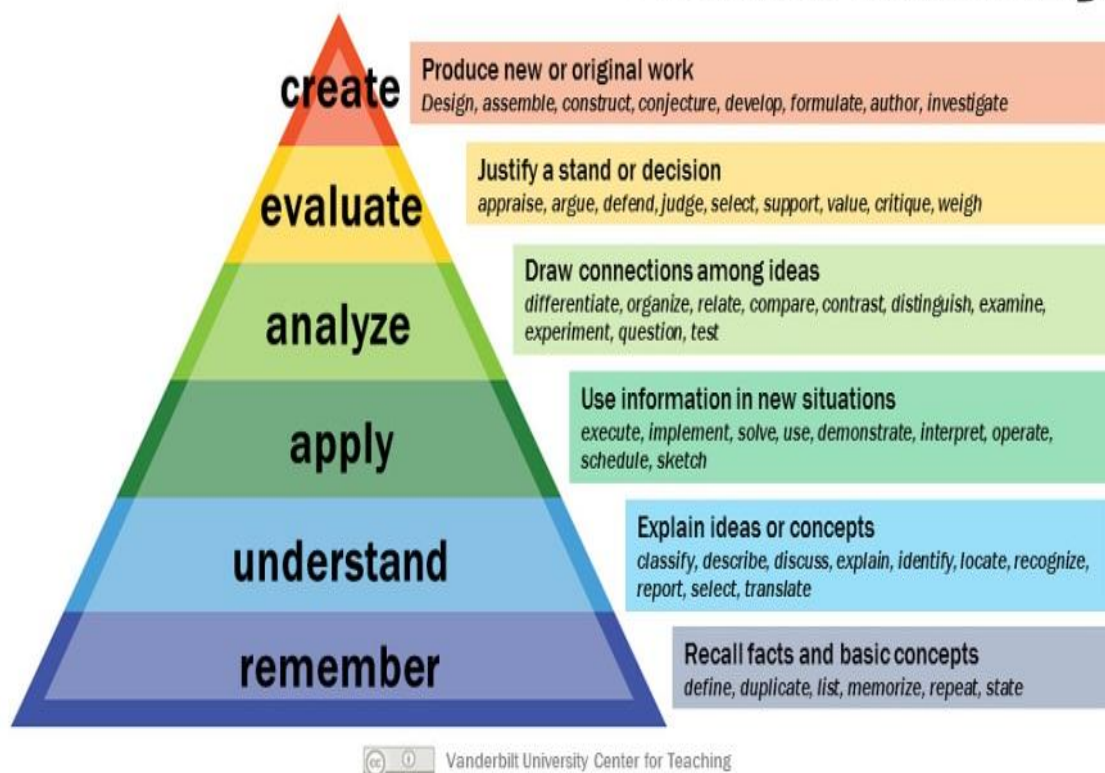
Introduction

Since the times of Plato and Aristotle, education has been seen as a foundation for a balanced society, requiring careful planning, with the curriculum being a key example. Kelly (2016) defines curriculum as a structured program of teaching and instruction, encompassing various educational tools. Textbooks, in particular, play a central role in the teaching and learning process, especially in developing countries like Pakistan, where they are often the primary or sole educational resource. Hamza (2004) emphasizes that in Pakistan, textbooks are the main tool for teaching, learning, and reference in language education. A textbook not only provides content to shape learners' ideologies, values, and behaviors but also includes exercises at the end of each lesson to reinforce and clarify the material. This approach to evaluation benefits all stakeholders—students, teachers, and the education system—and can lead to improvements and updates in textbooks.

Bloom's Taxonomy, developed by Dr. Benjamin S. Bloom and his colleagues, is a crucial framework for testing, evaluation, and curriculum development. It includes three domains: Cognitive, Affective, and Psychomotor. The Cognitive Domain covers Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation. Woolfolk and Margetts (2012) note that in real-life learning, behaviors from all three domains often occur

simultaneously, as students may engage in physical tasks (Psychomotor), recall information (Cognitive), and exhibit emotional responses (Affective) at the same time. While Bloom and his colleagues successfully devised the objectives for the Cognitive and Affective Domains, they could not create a framework for the Psychomotor Domain. Mohammad and Kumari (2007) note that although the committee did not propose a model for this domain, various researchers later attempted to develop one. Kegan (1977) highlighted the usefulness of Bloom's Taxonomy in curriculum planning and evaluation, especially in nontraditional educational settings. Forehand (2010) emphasized that Bloom's Taxonomy is applicable in any learning context, supporting effective teaching and assessment. For over 60 years, Bloom's Taxonomy has been widely used to design curriculum, activities, and assessments that engage all levels of thinking, including information-seeking skills. Originally created in 1956 by Benjamin Bloom and collaborators, the taxonomy was revised in 2001 by a group of cognitive psychologists and educators, shifting from a static to a dynamic approach to classification in "A Taxonomy for Teaching, Learning, and Assessment."

Bloom's Taxonomy



Comparison between SLOs based competencies with Bloom's Taxonomy Levels

S.No.	SLOs Competencies according to SNC(2022)	based to	Bloom's Taxonomy Level
1	Oral Communication		Application and Synthesis(Create)
2	Reading & Critical thinking		Analysis, Synthesis(Create) and Evaluation
3	Vocabulary & Grammar		Remember and Application
4	WRITING		SYNTHESIS(CREATE) AND EVALUATION

By organizing competencies according to Bloom's Taxonomy, it becomes easier to understand how each competency builds on different cognitive skills, highlighting the depth and complexity of mastering them. Moseley, D., Baum field, V., Elliott, J., Gregson, M., Higgins, S., Miller, J., & Newton, D. P. (2005) provide frameworks for thinking, including an analysis of Bloom's Taxonomy, and offer strategies for teaching and assessing various cognitive skills in their book.

- Oral Communication/ Application and Synthesis (Create)At the Application level, students demonstrate the ability to use communication skills effectively in various contexts. At the Synthesis level, they may integrate information from different sources to articulate complex ideas orally. Anderson and Krathwohl (2002) shows that application involves the use of acquired knowledge in new situations.
- Reading & Critical thinking/ Analysis, Synthesis (Create) and Evaluation: Reading involves analyzing information, synthesizing ideas, and evaluating content. Critical thinking is associated with higher-order cognitive skills such as analyzing, synthesizing, and evaluating information.
- Vocabulary & Grammar/ Remember and Application: Learning vocabulary and grammar involves acquiring knowledge about language rules (Remember level) and applying these rules in communication (Application level).
- Writing/ Synthesis (Create) and Evaluation: Writing typically involves synthesizing information to create coherent and organized written content. Evaluation may be applied when students assess the effectiveness of their own or others' writing.

Different Cognitive Demands Within Each Competency

The competencies (A, B, C, D) are not listed in the same order as the Bloom's Taxonomy levels because each competency encompasses a range of cognitive processes rather than fitting neatly into a single level of Bloom's Taxonomy. Heong, Y. M., Yunos, J. B. M., Hassan, R.

B., Othman, W. B., & Kiong, T. T. (2011) explores students' perceptions of higher-order thinking skills and their alignment with educational objectives, providing insights into the application of Bloom's Taxonomy in technical education. Here's a critical examination of why this might be the case:

- **Oral Communication:** While primarily involving "Application and Synthesis", it also requires elements of Analysis (e.g., understanding and responding to others) and Evaluation (e.g., assessing the effectiveness of communication strategies).
- **Reading & Critical Thinking:** Though it focuses on higher-order thinking skills like "Analysis, Synthesis, and Evaluation", it also relies on foundational skills such as Knowledge and Comprehension (understanding basic content before critically analyzing it).
- **Vocabulary & Grammar:** Mostly involves "Remember and Application", but advanced language use also requires Analysis (understanding nuanced meanings) and Synthesis (combining words and grammatical structures in novel ways).
- **Writing:** Predominantly involves "Synthesis and Evaluation", but effective writing also depends on Knowledge (vocabulary and grammar) and Application (using these elements correctly in context).

Interconnected Nature of Competencies

Each competency overlaps with multiple levels of Bloom's Taxonomy, reflecting the interconnected nature of language skills:

- **Integration of Skills:** Language competencies are not isolated; effective communication often requires simultaneously employing multiple cognitive processes. For example, writing involves not just creating content (Synthesis) but also understanding the audience and context (Application and Analysis).
- **Progression and Mastery:** As students' progress, they move through different cognitive levels within each competency. Mastery in any competency likely requires developing skills across several levels of Bloom's Taxonomy.

Complexity and Depth of Each Competency

The complexity of each competency might necessitate engagement with multiple cognitive levels. Marzano, R. J., & Kendall, J. S. (Eds.). (2006) discusses empirical studies that investigate the hierarchical structure of Bloom's Taxonomy and its application in various educational contexts.

- **Oral Communication:** Engages both lower-order skills (recalling vocabulary) and higher-order skills (constructing arguments, persuading others).
- **Reading & Critical Thinking:** Involves understanding basic content (lower-order skills) and making inferences, evaluating arguments (higher-order skills).
- **Vocabulary & Grammar:** Starts with knowing and remembering words/rules (lower-order skills) but extends to

using them effectively in various contexts (higher-order skills).

- Writing: Requires foundational knowledge (vocabulary and grammar), the ability to organize and synthesize ideas, and critical evaluation of one's own and others' work.

Educational Objectives and Outcomes

Educational objectives in language learning often span multiple levels of Bloom's Taxonomy, highlighting the need for comprehensive skill development. Forehand (2010) stresses the continued relevance of the taxonomy in education, while a holistic approach to teaching integrates various cognitive processes. The study aims to assess if primary-level English textbooks and competencies address all cognitive levels of Bloom's Taxonomy, ensuring students develop both higher-order thinking skills and foundational knowledge.

Statement Of The Problem

The alignment between the Single National Curriculum (SNC) 2022 and English Textbooks for Grade 4 in Khyber Pakhtunkhwa is vital to ensure effective learning by reflecting the intended Student Learning Outcomes (SLOs). Evaluating this alignment helps identify gaps that may impede the development of students' knowledge and skills. Bloom's Taxonomy provides a framework to categorize educational goals by cognitive complexity, enabling an assessment of how well the SLOs align with textbook content across varying cognitive levels.

Despite its importance, limited research exists on the alignment of SNC 2022 SLOs with English textbooks through the lens of Bloom's Taxonomy. This gap poses challenges to fostering essential competencies among students. The study addresses this issue by systematically analyzing the alignment, aiming to identify discrepancies, enhance curriculum development, and improve educational outcomes.

The Significance Of The Research

This study may be significant as it sheds light on how well the Grade 4 English textbook aligns with the Single National Curriculum (SNC) 2022, evaluated through the framework of Bloom's Taxonomy. By identifying gaps or overlaps between the curriculum and the textbook, the findings may benefit multiple stakeholders:

It may provide insights to improve curriculum design, help teachers utilize textbooks more effectively, and guide publishers in refining content to promote higher-order thinking skills. The findings may inform policymakers about the effectiveness of current educational resources in meeting national goals, supporting data-driven decisions for educational improvements. Ultimately, ensuring alignment may enhance the learning experience, helping students achieve desired educational outcomes and contributing to a more effective education system in Pakistan.

Objective Of This Study

The following was the objective of this study:

Analyzing the degree of alignment between the SLOs with respect

to competencies: Oral Communication (A), Reading and Critical Thinking (B), Vocabulary & Grammar (C), and Writing (D), outlined in the Single National Curriculum (SNC) and English Textbook of Grade 4, utilizing Bloom's Taxonomy as a guiding framework.

Research Question

The objective of this study was addressed by the following research question.

Up to what extent does the English textbook published by the Khyber Pakhtunkhwa Textbook Board, Peshawar, align with the Single National Curriculum (SNC) 2022 in terms of SLOs for competencies—Oral Communication (A), Reading & Critical Thinking (B), Vocabulary & Grammar (C), and Writing (D)—for Grade 4 at the primary level, using Bloom's Taxonomy as a guiding framework?

Research Methodology

The method and process used to carry out the study are covered in this part. It explains the design that was employed, how data was gathered using various tools, and how the tools were utilized to gather information.

Research Design

A “quantitative based document analysis” was chosen in light of the study's objective. Quantitative data is gathered and analyzed from the documents of SNC 2022 and Textbook of English for Grade 4.

Data Sources of the Study

The data sources of study were.

- The document of SNC 2022 of English: The Ministry of Federal Education and Professional Training in Islamabad, Pakistan (<http://www.mofept.gov.pk>) developed for Grade 4.
- English textbooks for Grade 4 published by the Khyber Pakhtunkhwa Textbook Board in Peshawar (KPTBP), which have been approved by Abbott Abad, the director of curriculum and teacher education in Khyber Pakhtunkhwa.

Research Ethics

The study sought explicit permission to use a data collection tool "Surveys of Enacted Curriculum [SEC]" through E-mail, developed by Andrew Porter. This conscientious approach underscores the commitment to maintain ethical standards throughout the research process. This approach respects intellectual property and promotes transparency, safeguarding the study's integrity and fostering trust within the scientific community.

Data Analysis

Using Porter's (2002) alignment index formula, the quantitative measure of alignment was determined:

$$\text{The Alignment Index} = 1 - \sum |x - y| / 2$$

In this study, a matrix approach was used to compare curriculum (x) and textbook (y) alignment, with 14 chapters and 4 competencies (Oral Communication, Reading & Critical Thinking, Vocabulary & Grammar, Writing), resulting in 14x4 matrices for both. Porter's

(2002) alignment index formula, implemented via Microsoft Excel, quantified the alignment, while Fulmer's (2011) critical values table assessed its strength. The findings were presented through comparative tables and graphs, illustrating the degree of alignment across competencies.

Value of Alignment Index

The following values of alignment index were used to determine the level of alignment between SNC and Textbook as suggested by (Fonthal, 2004; Fulmer, 2011; Ndlovu & Mji, 2012).

Weight	Scale	Range
1	Good aligned	0.91-1.00
2	Significantly aligned	0.81-0.90
3	Considerably aligned	0.71-0.80
4	Considerably misaligned	0.61-0.70
5	Significantly misaligned	0.51-0.60
6	Critically misaligned	≤ 0.50

Analyses And Interpretation Of Data

Research Question wise analysis of data and its interpretation is as follows.

Research Question: Up to what extent does the "SNC 2022" of English aligned with the English "Textbooks" published by Khyber Pakhtunkhwa Textbook Board Peshawar regarding SLOs with respect to competences: "Oral Communication" (A), "Reading & Critical thinking" (B), "Vocabulary & Grammar" (C) and "Writing" (D) for "Grades 4" at primary level, using Bloom's Taxonomy as a guiding framework?

Table 4 "Alignment" between Curriculum and Textbook for "Grade 4"

SLOs based Competences/ Bloom's Taxonomy Levels				
	(A) Oral Communication / Application & Synthesis	(B) Reading & Critical thinking/ Analysis, Synthesis & Evaluation	(C)Vocabulary & Grammar/ Knowledge & Application	(D) Writing/ Synthesis & Evaluation
AI	0.70	0.38	0.77	0.66
Values	Considerably misaligned	Critically misaligned	Considerably aligned	Considerably misaligned

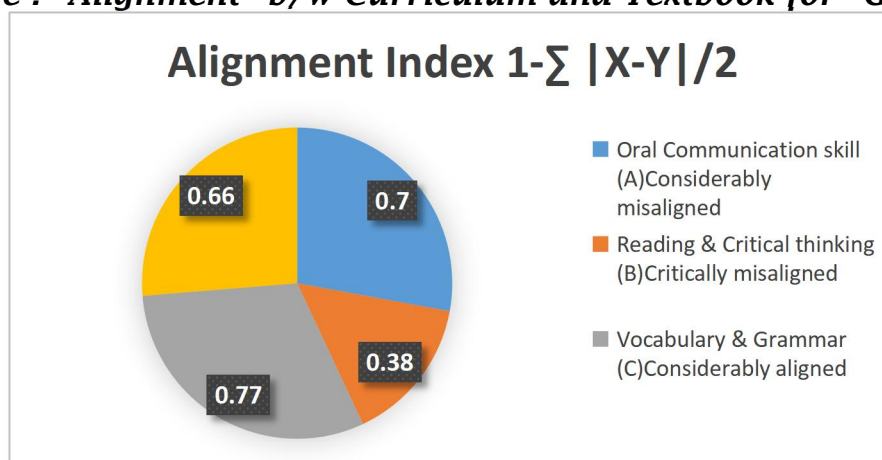
(AAI)	0.60 (Significant Misalignment)
Average Alignment Index (AAI) = Σ Alignment Index / total No of competences	

$$= 0.75 + 0.67 + 0.77 + 0.68 / 4$$

$$= 2.38 / 4 = 0.60 \text{ (Significant Misalignment)}$$

The analysis evaluates the "Alignment" between the "Curriculum" and the "Textbook" for "Grade 4" English, using the "Alignment Index" (AI) and the "Average Alignment Index" (AAI). The overall AAI is 0.60, indicating "Significant Misalignment" between the "Curriculum" and the "Textbook" for "Grade 4" English. This means that, on average, there is a significant degree of misalignment between the two sources. For "Oral Communication" (A)/ "Application & Synthesis", the AI is 0.70, suggesting "Considerable Alignment" with 70% of related content or objectives shared. "Reading & Critical Thinking" (B)/ "Analysis, Synthesis & Evaluation" has an AI of 0.38, indicating "Critical Misalignment" with 38% of related content or objectives shared. "Vocabulary & Grammar" (C)/ "Knowledge & Application" has an AI of 0.77, reflecting "Considerable Alignment" with 77% of related content or objectives shared. The AI for competency (D) "Writing"/ "Synthesis & Evaluation" is 0.66, indicating "Considerable Misalignment" with 66% of related content or objectives shared.

Figure : "Alignment" b/w Curriculum and Textbook for "Grade 4"



A Graphic Representation Of Data Is Given In Figure

Results And Discussion

The analysis of the Grade 4 English curriculum and textbook using Bloom's Taxonomy revealed disparities in SLO alignment across competencies. The overall Average Alignment Index (AAI) of 0.60 indicates "Significant Misalignment." While "Oral Communication" (AI 0.70), "Vocabulary & Grammar" (AI 0.77), and "Writing" (AI 0.66) showed "Considerable Alignment" at various cognitive levels, "Reading & Critical Thinking" (AI 0.38) was "Critically Misaligned," particularly at higher-order cognitive levels.

Previous studies emphasize the importance of aligning curriculum content with Bloom's Taxonomy to improve educational outcomes. Ryan and Bernard (2003) and Nsengimana and Mukantwari (2021) highlight underrepresentation of higher-order

cognitive skills (Analysis, Synthesis, Evaluation) in primary school exams in Rwanda, mirroring this study's finding of "Considerable Misalignment" at these levels. Muhayimana, Kwizera, and Nyirahabimana (2022) and Tabaro (2018) underscore the critical role of teacher preparedness and alignment of pedagogical practices with curriculum objectives in competency-based education, supporting the need for better alignment and training found in this study. Studies by Kuipers et al. (2019) and Overman (2013) stress that misalignments in curricular materials hinder student understanding and engagement, particularly when higher-order cognitive skills are inadequately addressed. Overman further highlights the importance of contextual and content alignment for fostering deeper learning and critical thinking. The Rwanda Education Board study (Muhayimana, 2022) reiterates the necessity of aligning examination content with Bloom's higher-order cognitive skills to ensure effective competency-based education, aligning with this study's findings on the impact of misalignment on curriculum efficacy.

Conclusions

In Grade 4, the overall "Average Alignment Index" (AAI) shows "Significant Misalignment" between SNC 2022 and the English Textbook. The Alignment Index (AI) indicates "Considerable Alignment" for "Oral Communication," "Vocabulary & Grammar," and "Writing," particularly at various Bloom's Taxonomy levels." However, there is "Critical Misalignment" in "Reading & Critical Thinking," reflecting significant gaps in aligning higher-order levels like "Analysis" and "Evaluation" between the curriculum and textbook.

Recommendations

Based on the findings of the alignment study between SNC 2022 and Grade 4 English textbooks, the following recommendations focus on Bloom's Taxonomy levels for each competency:

Alignment may be improved by incorporating activities that develop higher-order thinking, such as analyzing conversations and evaluating communication strategies. Teachers may receive professional development to design advanced oral tasks and integrate peer feedback. Misalignment in critical thinking may be addressed by including reading and project-based tasks focused on analysis, synthesis, and evaluation, with educator training to create challenging activities. Gaps in vocabulary and grammar may be bridged through tasks that encourage analysis and sentence construction, with support for educators in designing activities across cognitive levels. Finally, writing tasks focused on synthesis and evaluation, along with standardized prompts and rubrics, may ensure consistent development of higher-order skills.

To align with Bloom's Taxonomy, curriculum and textbook reviews may involve collaboration and standardized SLOs for consistent cognitive expectations. Feedback from teachers and students, along with pilot testing, may address issues early. Digital

tools may enhance coverage, especially in areas like Oral Communication and Writing, while ongoing evaluation ensures adaptability and improved student skill development.

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