



Original Article

Analyzing Language Assessment from the Cognitive Lens

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How to Cite:

Zamir, S., Jan, H., Ansari, S. R., Hussain, R., & Rehman, M. U. (2023). Analyzing language assessment from the cognitive lens. *Academy of Education and Social Sciences Review*, 3(4), 440–452.

<https://doi.org/10.48112/aessr.v3i4.614>

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Abstract

This study examined the alignment of cognitive stages in English exam items from the tenth grade administered by the Mirpur Khas Board. The main objective of the study was to analyze items related to lower-order-thinking skills (LOTS) and higher-order-thinking skills (HOTS). To accomplish this, 224 items from English test papers spanning from 2015 to 2019 were examined and their reflections were compared to the degree of cognition (remember, comprehend, apply, analyze, evaluate, and create). A reiterative process was adopted to complete item analysis in two parallel phases: First, to study all cognitive levels thoroughly, understanding the denotation and connotation of each action verb; second, to discern the sense for items to elicit meaning and matching it with the corresponding action verb at the cognitive level. The data collection tool comprised an observation checklist that was validated after piloting. All items were read and re-read, marked in the checklist, transferred on an Excel sheet, computed for categories under corresponding cognitive levels, and tabulated for appraising yearly standing. The findings indicate the disproportionate distribution of cognition levels: remember (67%), understand (10%), apply (18%), create (4.46%), evaluate (0.45%), and absence of analysis. Moreover, the LOTS received more predominance than the HOTS in the exam items. These findings raise questions pertaining to the authenticity of summative assessment and necessitate professional item development training in language teaching for the item developers to ensure effective teaching and learning outcomes. The findings suggest that the teachers should practice higher cognitive levels in the formative assessment.

Keywords: Bloom's Taxonomy, Cognitive domain, English exam items, Language assessment, Mirpur Khas Board

INTRODUCTION

The examinations (exams) have been central to education systems for many decades. The obvious justification is that the annual exam is one of the factors that controls classroom activities, and the competencies are compromised in the process. Since, the make-break of students' future links with the exams, so the quality of assessment process holds prime significance to yield the desired outcomes (Rind & Malik, 2019). Moreover, the annual exams test students' academic preparedness, and make them ready for future education (Borghouts et al., 2017). Thus, least importance is laid on the process of teaching and learning, and prime significance is attached to exams (Rind & Mari, 2019).

The importance of exams leads researchers to check the quality of exam papers. In this regard, Zamir and Jan (2023) found more lower order thinking skills (LOTS) than higher order thinking skills (HOTS) after examining five-year (2015-2019) annual exam papers of English for grade-ten using the Cognitive Domain of Bloom's Taxonomy (CD-BT) as a framework. Moreover, Chandio et al. (2021) examined 12th grade English exam papers from four different Boards of Intermediate and Secondary Education (BISE) over a five-year period (2014-2018). They discovered that while a minority of exam items (26%) evaluated higher-order learning, the majority (74%) of exam items indicated lower-order thinking. Similarly, an assessment of 12th grade exam papers of five subjects from six BISEs reported that the focus of items in was on rote memorization and understanding level of learning (Rind & Malik, 2019). These studies suggest that the quality of exam items lay on the LOTS.

Benjamin Bloom (1956) created a taxonomy of educational objectives, which is relatively new to the discussion of exam topics. Initially, the first Bloom's Taxonomy (BT) version comprised knowledge, comprehension, application, analysis, synthesis, and evaluation (Bloom, et al., 1956). However, over time, the BT labels were rearranged and renamed as recall, understand, apply, analyze, evaluate, and create (Bloom, 2010). The development of metacognitive knowledge, procedural knowledge, conceptual knowledge, and factual information (in order of highest to lowest knowledge levels) resulted from further knowledge-based classification of the BT (Seel, 2011). Initially, the BT was a conceptual framework, practiced as a weak theory-application relationship. However, nowadays, it is used for exam item development, designing textbooks, and the development of curriculums. The item-developers make use of the BT for the development of standard items for exam paper (Omar et al., 2012).

An overemphasis on the annual exam and its dismissive outcome has defocused the teaching and learning process. The LOTS and HOTS were found asymmetrical. Chandio, et al. (2021) also reported an item development leaning toward the LOTS. The situation manifests the purpose of exams focus on

certification, rather than effective learning. The discrepancy between how education should be and what education actually is, justifies teachers' attitude towards teaching as students' preparation for exams and compromising on the laborious year-long process just to secure good marks (Chandio et al., 2016). Hence, being hard work and reflects teachers' dedication. But, testing students' skills and learning level competencies still invite an inquiry in the context of Mirpur Khas Board.

The literature is replete with exam paper analyses of different examination boards operating in Sindh and across Pakistan. However, there is a dearth of literature on Mirpur Khas Board. Therefore, this study attempted to examine the exam papers of Mirpur Khas Board to fill the knowledge and contextual gap. Since, board exams have a long history, and assessing all exam papers is a daunting task, therefore, this study selected papers administered from 2015 to 2019. Moreover, the selection of Mirpur Khas Board was for understanding and explaining the pertinent findings. To rationalize the selection of English subject papers as the unit of analysis, was that English is the compulsory subject from early education up to higher education and students have to clear this subject (Khan et al., 2021) for class-promotion, and better career prospects. For these reasons, this study found annual exam papers as an important factor in understanding students' cognitive abilities.

Research Questions

- Which levels of Bloom's Taxonomy's Cognitive Domain are represented in the English matriculation test papers by the Mirpur Khas Board of Intermediate and Secondary Education from 2015 to 2019?
- How do the English matric exams from 2015 to 2019 by the Mirpur Khas Board of Intermediate and Secondary Education measure up in terms of critical thinking abilities as defined by Bloom's Taxonomy's Cognitive Domain?

LITERATURE REVIEW

The exam refers to an assessment activity (Elwood, et., 2017) or a process to test if the students have learnt the necessary skills or knowledge, and their prior knowledge (Baird et al., 2017) with purposes to assess students learnt skills and knowledge (Al Amin & Greenwood, 2018) and to certify students for promotion of higher grades, and provide feedback on students' learning (Boud & Falchikov, 2006). Further researches suggest that exam results indicate students' cognitive levels integral to any lesson (Köksal & Ulum, 2018). In Sindh, Pakistan, there are eight examination boards operating: federal board, two private boards, and five divisional boards. These boards are responsible for the administration of exams from 9th-grade to 12th-grade throughout the country (Rind & Malik, 2019). Sindh Government departments manage and operate the divisional boards: Sukkur, Hyderabad, Larkana, Karachi and Mirpur Khas. The private exam bodies include the Agha Khan University-Exam Board and the Cambridge Exam System, whereas federal board function under Federal Government that offers exam services to affiliated schools and colleges throughout the country.

Most studies focused on questions in the exams. For instance, Köksal and Ulum (2018) examined exam papers of English language course for writing, listening, vocabulary, reading, speaking, and grammar of universities in Turkey; despite including action verbs in the questions of understand and remember levels mostly other levels of the CD-BT were ignored. In similar vein, Cullinane and Liston (2016) attempted to identify learning levels of exam papers of Biology in Ireland by setting cognitive domain as a standard; and their study reported that exam items centered around lower-order learning levels. Similarly, Alzu'bi (2014) studied written test of English to examine cognitive levels of questions as per the CD-BT; the findings revealed that 69.6% items reflected lower-level while 30.4% indicated higher-levels.

Furthermore, Assaly and Smadi (2015) assessed textbook questions of a postgraduate class in Israel; the inquiry tool comprised a checklist, designed on the cognitive domain to examine 137 questions; the results reported 40% higher-order, and 60% lower-order questions. In Rawanda, Muhayimana et al. (2022) analyzed seventh-grade papers of English for checking the cognitive levels of items; the results reported 1.21% items of higher-order, and 989.79% items of lower-order. In Pakistan, Zamir and Jan (2023) examined Sukkur board exam papers of English of five years (2015-2019); the item-analysis reported 39.47%, 23.2%, 22.66%,14.67% for remember, understand, create, and apply levels respectively,

while analyze and evaluate levels were absent. The literature established a tilted picture of LOTS, which alluded to knowledge gap in the context of Mirpur Khas. Thus, this study attempted to assess items of exam papers of Mirpur Khas Board against the CD-BT, and also examined thinking skills reflected in those items.

The Cognitive Domain of Bloom’s Taxonomy

Bloom’s Taxonomy (BT) proposed representation of clear description of evidence-based student learning outcomes in the classrooms through questioning process to help teachers think differently about test items for the measurement of students’ academic performance; the levels of the cognitive domain—knowledge, comprehension, application, analysis, synthesis, and evaluation—that span from low-order to high-order knowledge which enabled teachers to align student assessments with learning objectives for the improvement of instructional delivery, and enhancing the learning goals through cognitive complexity (Lasley, 2023). The process dimension of the cognitive domain can be divided into two main categories, according to Sivaraman and Krishna (2015) remember, understand, and apply (HOTS), and analyze, evaluate, and create (LOTS).

Lower Order Thinking Skills			Higher Order Thinking Skills		
Remember recalling (retrieving)	Understand exemplifying (illustrating, instantiating)	Apply executing (carrying out)	Analyze organizing (finding coherence, integrating, outlining, parsing, structuring)	Evaluate critiquing (judging)	Create producing (construct)
recognizing (identifying)	inferring (concluding, extrapolating, interpolating, predicting)	implementing (using)	differentiating (Discriminating, distinguishing, focusing, selecting)	checking (coordinating, detecting, monitoring, testing)	planning (designing)
	interpreting (clarifying, paraphrasing, representing, translating)		attributing (deconstructing)		generating (hypothesizing)
	classifying (categorizing, subsuming)				
	explaining (constructing models)				
	summarizing (abstracting, generalizing)				

Fig. 1: Cognitive Domain of Bloom’s Taxonomy

Note. Adopted from Sivaraman and Krishna (2015)

The Conceptual Framework

The researchers have used cognitive domain of BT framework as student testing tool for the development of items for quizzes and exam papers. The wide acceptance and implication of BT framework matches with the aims of the present study. Therefore, the cognitive domain of BT set the conceptual framework of this study to examine grade-10 items of English of Mirpur Khas Board.

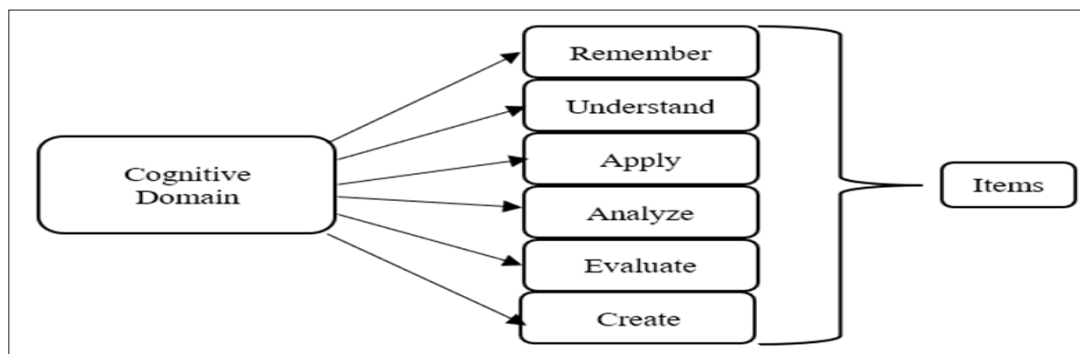


Fig. 2: The Conceptual Framework

METHODOLOGY

The study aimed to analyze exam papers of Mirpur Khas examination Board to elicit the reflection of the cognitive levels of Bloom's Taxonomy. To achieve this end, this study devised the desk research methodology for the data collection and data analysis on previously administered papers of English for 10th grade from 2015 to 2019. The philosophical stance was positivism, which holds that the objective reality and truth can be achieved through scientific method, where inquiry is based on the notion that only one reality exists (ontology), and the nature of knowledge is objective (epistemology), and out there, hence, objective reality is measurable, which allows structured observation research methodology of quantitative analysis (Patel, 2016).

The analysis process involved a careful examination of every question paper item through the lens of cognitive levels of the BT. The items were evaluated for their connotation and denotation as written in the exam papers. Each item was examined and marked on the observation sheet. For every year's exam paper, a separate entry was made in the observation sheet. Afterward, all five-year exam papers were analyzed, and a final joint table was formulated representing the analysis report of all exam papers. The sample of the study comprised 10th grade past five-year papers of English of Mirpur Khas Board. The question papers comprised one objective and two subjective sections: the objective section had multiple choice questions (MCQs), while the first subjective section comprised fill-in-the-blank items, short-answer items, word-antonyms, word meaning, sentence translation, and sentence correction items; the second subjective section contained extended response questions—composing a letter, writing an application, and writing an essay.

The data collection process initiated with designing the observation checklist based on six-levels of the CD-BT. Each item was examined against cognitive domain levels of BT, and marks were calculated to determine per cent for each year from 2015 to 2019 separately (Table 1). The question pattern for each year paper was designed separately according to appearance of different items.

Table 1

Paper Outline in 2015, Mirpur Khas Board

Part	Item No.	Type of Item	Item	Marks	Level	Marks %
A	1	MCQs				
B	1	Short answer questions				
C	10	Write a paragraph				

At the final level of analysis, a year-wise comparative table representation showcased computed per cent across all cognitive levels of BT for all five-year (Table 2).

Table 2

Reflection of Five-year English Subject Paper, Mirpur Khas Board

Level	2019 %	2018 %	2017 %	2016 %	2015 %	Total %
Remember						
Understand						
Apply						
Analyze						
Evaluate						
Create						

RESULTS & FINDINGS

For the academic year 2015, the English section of the Mirpur Khas Board exam consisted of three sections, A, B, and C, totaling 75 marks, and a three-hour time limit (Table 3). This section consisted of 20 minutes of multiple-choice questions (MCQs) that were objective in nature. Parts B and C of the constructed response questions (CRQs) each had 160 minutes, and there were nine short answer questions out of thirteen items. Three long answer questions from five items comprised the extended

response questions (ERQs), and part C received 24 marks for ERQs.

Table 3

Mirpur Khas Board's English Subject Paper in 2015

Part	Item No.	Type of Item	Item	Marks	Level	Marks %
A	1	MCQs	15	15	R	20
B	2-9	Short answer questions	8	32	R	42.67
	10	Use "Since" or "For" in the following sentences	4	4	A	5.33
	11	Make nouns of the following	4	4	R	5.33
	12	Use the idioms in the sentences of your own	4/5	4	A	5.33
	13	Give a general phrase or word to the following	4	4	U	5.33
	14	Give the meaning of the following words in English	4	4	R	5.33
	15	Write an essay of 100 to 120 on any one	1/3	8	C	10.67
C	16	Summarize any one of the following in your own words	1/2	8	U	10.67
	17	Write a note on any one	1/2	8	R	10.67
	18	Translate the passage into Sindhi	1	8	U	10.67
	19	Write an application or a letter	1/2	8	C	10.67

Note. C=Create, A=Apply, U=Understand, R=Remember.

The objective questions in Part A of the test started off with 15 items, each worth 15% of the total marks (20%). From question two to question nine, which were in section B of the test, the following subjective questions were asked: all items were short answer questions (04 marks per item equals 5.33%), and these items reflected remember-level; question 10 dealt with using "since" or "for" in sentences (4 marks equals 5.33%); question 11 required students to create nouns from the given verbs (4 marks equals 5.33%); question 12 required students to use idioms in sentences (4 marks equals 5.33%); in question 13, students were asked to provide a broad term or phrase to describe the supplied nouns (4 marks, or 5.33%), which indicated an understand-level response; in question 14, students were asked to provide the definition of the given words (4 marks, or 5.33%), which showed a remember-level response.

Extended response questions were in Part C of the exam: in question 15, students had to choose 1/2 topic from which to compose an essay (8 marks, or 10.67%), reflecting the create-level; in question 16, students had to summarize the subject matter (8 marks, or 10.67%), reflecting the understand-level; question seventeen asked students to write a short note on any one out of two topics (8 marks of 10.67%) which reflected remember-level; question 18 asked candidates to translate a passage into Sindhi (8 marks, or 10.67%), which was classified as understand-level work. Question 19, which asked candidates to choose between drafting an application or a letter (8 marks, or 10.67%), was classified as create-level work in the CD-BT.

The three sections, all consisting of 75 marks, lasted for three hours and comprised of the English components of the 2016 Mirpur Khas Board exam (Table 4). The time allotted for this section was fifteen minutes: A) The objective questions included multiple choice questions (MCQs); B) The constructed response questions (CRQs) had nine short answer questions out of thirteen; the marks for CRQs were thirty-six; and C) The extended response questions (ERQs) had three long answer questions out of five items; the marks for ERQs were twenty-four.

The objective questions kicked off Part A of the paper. The very first question consisted of questions with multiple choices (15 items totaling 15 marks of 20%) based on recall ability. Although the second through fifth questions in part B of the exam were subjective, every item was based on a brief response (4 marks per item, or 5.33%), with three items reflecting recall level, and one item reflected understand-level, question six was about using the words in the sentences (4 marks of 5.33%), the item reflected apply-level; question seven was on giving synonyms to the words (4 marks of 5.33%), this item corresponded to remember-level; from question eight to question twelve, the items were based on short answer questions (4 marks on each item of 5.33%), these items reflected remember-level; the "do as directed" question (4 marks of 5.33%) in question thirteen was classified as apply-level material; item fourteen was from short

answer items (4 marks of 5.33%), and it reflected remember-level.

Table 4
Mirpur Khas Board’s English Subject Paper in 2016

Part	Item No.	Type of Item	Item	Marks	Level	Marks %
A	1	MCQs	15	15	R	20
	2-5	CRQs	4	16	R 3 U 1	15.99 5.33
	6	Use the following words in your sentences	3	4	A	5.33
B	7	Give synonyms	4	4	R	5.33
	8-12	CRQs	5	20	R	26.67
	13	Do as directed	4	4	A	5.33
	14	Who was Casabianca?	1	4	R	5.33
	15	Write an application or a letter	1/2	8	C	10.67
	16	Write a summary on any one of the following	1/3	8	U	10.67
C	17	Write a note on any one	1/2	8	R	10.67
	18	Write a paragraph on any one of the following	1/3	8	C	10.67
	19	Translate the passage into Sindhi or Urdu	1	8	U	10.67

Note. C=Create, A=Apply, U=Understand, R=Remember.

Part C of the test contained questions that were subjective. Students had to write a summary of any one of three topics (8 marks of 10.67%), which was at understand-level; in question seventeen, they had to write a brief note on any one of two topics (8 marks of 5.33%), which was at remember-level; in question eighteen, they had to write a paragraph on any one topic (8 marks of 5.33%). In question fifteen, students could choose between writing a letter or an application (8 marks of 10.67%), which was at create-level.

A, B, and C—each carrying 75 marks and lasting 3 hours made up the English portion of the Mirpur Khas Board exam for the 2017 academic year. Multiple choice questions (MCQs) were included in objective questions (A), and 15 minutes were allotted for this part. Constructed response questions (CRQs) consisted of nine short answer questions to answer from thirteen items with 36 marks for CRQs, and 165 minutes were allotted for part B and C. Extended response questions (ERQs), on the other hand, contained three long answer questions to answer from five items of 24 marks (Table 5).

Table 5
Mirpur Khas Board’s English Subject Paper in 2017

Part	Item No.	Type of Item	Item	Marks	Level	Marks %
A	1	MCQs	15	15	R	20
	2-7	Short answer questions	6	24	R	32
	8	Use any three idioms in your own sentences	3/4	4	A	5.33
	9	Do as directed	3	4	A	5.33
B	10-11	Short answer questions	2	8	R 1 U 1	5.33 5.33
	12	Give the opposite of the words	4	4	R	5.33
	13-14	Short answer questions	2	8	E 1 R 1	5.33 5.33
	15	Write an application or a letter	1/2	8	C	10.67
C	16	Write a short note on any one	1/2	8	R	10.67
	17	Write a summary on any one of the given topics	1/3	8	U	10.67

Note. C=Create, E=Evaluate, A=Apply, U=Understand, R=Remember.

The objective questions were asked first in Part A in the exam. The first question was consisted of 15 MCQs, each worth 15% of the possible marks and 20% of the total marks. From question two to question seven on Part B of the test, there were open-ended, subjective questions; all of the items were based

on short answers (4 marks per item, or 5.33%), and they all reflected remember-level; question eight was about using idioms in sentences (4 marks of 5.33%), and the items reflected apply-level knowledge; question nine (4 marks of 5.33%) was on "do as directed," the item was based on the apply-level; questions ten and eleven (4 marks on each, 5.33%) were from the short answers; questions ten and eleven reflected understand-level; and question twelve reflected remember-level; questions thirteen and fourteen were once more from the short answers; they were both placed at remember-level; question fifteen (8 marks of 10.67%) required students to choose between writing a letter or an application, earning a create-level; question sixteen (8 marks of 10.67%) required students to write a brief note on any one topic out of two, earning a remember-level; question seventeen required students to summarize any one topic out of three (8 marks of 10.67%), earning an understand-level; and question eighteen required students to answer a multiple-choice question.

The English subject in Mirpur Khas Board's 2018 exam was divided into three parts, each worth 75 marks and for the duration of three hours. The time allotted for part A's objective questions was 15 minutes. Parts B and C's constructed response questions (CRQs) consisted of nine short answer questions to answer from thirteen; the marks allotted for CRQs were 36; and Part C's ERQs contained three long answer questions to answer from five items; the marks allotted for ERQs were 24 (Table 6).

Table 6

Mirpur Khas Board's English Subject Paper in 2018

Part	Item No.	Type of Item	Item	Marks	Level	Marks %
A	1	MCQs	15	15	R	20
	2-8	Short answer questions	7	32	R	42.67
	9	Use the idioms in your own sentences	3	4	A	5.33
B	10	Give degrees of the following adjectives	4	4	R	5.33
	11	Do as directed	4	4	A	5.33
	12	Give the feminine of the following	4	4	R	5.33
	13-14	Short answer questions	2	8	R	10.67
	15	Write an essay on any one of the following	1/2	8	C	10.67
	16	Write a summary on any one of the following	1/3	8	U	10.67
C	17	Write a short note on any one	1/2	8	R	10.67
	18	Write an application or a letter	1/2	8	C	10.67
	19	Translate the passage into Sindhi/Urdu	1	8	U	10.67

Note. C=Create, A=Apply, U=Understand, R=Remember

The objective questions were asked first in Part A of the exam. The first question was composed of 15 multiple-choice questions (MCQs), each worth 20% of the total marks. From questions two to eight on Part B of the test, all of the items were short answers (4 marks of 5.33%), and they all reflected remember level. Questions nine and ten (4 marks of 5.33%) were about using idioms in sentences, and they both reflected apply level. Question ten (4 marks of 5.33%) asked students to give degrees to the following adjectives, and it was based on remember level. The focus of question eleven (4 marks of 5.33%), which was categorized as apply-level, was to follow instructions; feminine forms of the words were required in question twelve (4 marks of 5.33%), which was situated at the remember-level; and questions thirteen and fourteen were short answer items (4 marks of 5.33%), the questions for which were based on the remember-level. Subjective questions were found in Part C of the exam. Students were required to prepare an essay on any one topic (8 marks out of 10.67%) for question fifteen; in question sixteen, which was at the understand-level, students had to provide a summary of any one of three topics (8 marks out of 10.67%); Students were required to write a brief note on any one of two topics (8 marks, 10.67%) in question seventeen, depending on their recall level; in question 18, students had to decide whether to write a letter or an application (8 marks, or 10.67%), earning them a create-level score. In question 19, they had to translate the passage into Sindhi or Urdu (8 marks, or 10.67%), earning them an understand-level score in the CD-BT.

The English paper for the Mirpur Khas Board in 2019 was divided into three parts, each worth 75 points

and lasting three hours: A) A) multiple-choice questions (MCQs); 15 marks were allotted for MCQs, and this part had a 15-minute time limit; B) constructed response questions (CRQs), which had nine short answer questions to respond to from twelve items; 36 marks were allotted for CRQs; and C) extended response questions (ERQs), which had three long answer questions to respond to from five items of 24 marks (Table 7).

The objective questions were asked first in Part A of the exam. In the first question, there were 15 MCQs with a 20% recall rate and 15 marks each.

Table 7

Mirpur Khas Board’s English Subject Paper in 2018

Part	Item No.	Type of Item	Item	Marks	Level	Marks %
A	1	MCQs	15	15	R	20
	2-9	CRQs	8	32	R	42.67
B	10	Use the idioms in your own sentences	4	4	A	5.33
	11	Write down synonyms of the following words and tell the meaning in Sindhi/Urdu	4	4	R	5.33
	12	Change the form of words	4	4	A	5.33
	13	Do as directed	4	4	A	5.33
	14	Write an essay on any one of the following	1/2	8	C	10.67
	15	Write an application or a letter	1/2	8	C	10.67
	16	Write a short note on any one	1/2	8	R	10.67
C	17	Write a summary on any one of the following	1/2	8	U	10.67
	18	Translate the sentences into English	4	8	U	10.67
	19	Translate the passage into Sindhi/Urdu	1	8	U	10.67

Note. C=Create, A=Apply, U=Understand, R=Remember

Question two to nine (4 marks of 5.33%) in part B of the exam were subjective, all the items were short-answer questions and reflected remember-level; question ten (4 marks of 5.33%) was about using the idioms in the sentences, the item reflected apply-level; question eleven (4 marks of 5.34%) was about to write the synonyms and the meaning for the given words, the item was based on the remember-level; question twelve (4 marks of 5.33%) asked students to change the present form of verb to past, and past participle, that represented apply-level; question thirteen (4 marks of 5.33%) was on ‘do as directed’ that reflected apply-level. Subjective questions were found in part C; in question fourteen (8 marks of 10.67%), students had to write an essay on any one topic, and that item was based on create-level; a choosing to submit an application or write a letter observed in question fifteen (8 marks of 10.67%), which earned create-level; in question sixteen (8 marks of 10.67%) students had to write a short note on any one topic out of two, that was based on remember-level; in question seventeen (8 marks of 10.67%) students had to make a summary of any one out of three topics, that was placed at understand-level; in question eighteen (8 marks of 10.67%) students had to translate the sentences into English, that earned understand-level in the CD-BT.

Table 8 displays the percentage distribution for every cognitive domain level, based on calculations made for the English paper of the Mirpur Khas Board exam between 2015 and 2019. The percentage is distributed level-wise from remember-level to produce-level. The table with the most elements is dominated by the remember-level of cognitive level. With 40 items, apply-level is in second position. With 23, understand-level moves up to third position. With only 10, create-level is in fourth place. Additionally, just one question is evaluate-level. Surprisingly, the analyze-level item was completely absent.

Table 8
The Cognitive Domain Reflection in the Mirpur Khas Board

Level	2015	%	2016	%	2017	%	2018	%	2019	%	Items	%
Remember	32	42.7	29	38.7	28	37.3	33	45.8	28	37.3	150	67
Understand	6	8	3	4	7	9.3	2	2.7	5	6.7	23	10
Apply	8	10.7	7	9.3	6	8	7	9.3	12	16	40	18
Analyze	0	--	--	--	--	--	--	--	--	--	--	--
Evaluate	0	--	--	--	1	1.3	--	--	--	--	1	0.45
Create	2	2.7	2	2.7	2	2.7	2	2.7	2	2.7	10	4.46

The percentage calculated is based on items appeared in question paper according to cognitive levels. The per cent information reiterates that the most dominant level to test the level of students' linguistic abilities was remembering. The existing paper design indicates a tilt towards surface level knowledge more than higher order knowledge. In terms of order of thinking skills, the past five-year papers of Mirpur Khas Board suggest LOTS, which indicate gaps to be addressed in the item development process for enhancing the standard of items.

The results for 224 items analyzed, suggested a contrastive difference from the HOTS to the LOTS (Figure 3). The calculations computed for LOTS, present 95.1% coverage of items, whereas only a proportion of items (4.9%) indicate HOTS. The results show that in the five-year papers the LOTS received more attention than HOTS.

	Level	Items	%
L O T S	Remember	150	95.1
	Understand	23	
	Apply	40	
H O T S	Analyze	--	4.9
	Evaluate	1	
	Create	10	

Fig. 3: Reflection of HOTS and LOTS

The contrastive differences suggested teachers to focus on the LOTS during teaching process, and students to prepare for the LOTS to earn more marks in the board exam. Moreover, this result makes teachers and students feel easy about the HOTS, as most previous exam items represented the LOTS. Thus, this lessens the academic stress and anxiety for students to prepare for exam. However, at the same time, students may face difficulty when encountering life challenges that demand HOTS for professional, social, and personal adjustment.

Discussion

This study examined 224 items of the exam papers of English from year 2015 to 2019 of Mirpur Khas Board to see their reflection with the cognitive level of BT. The nature of the items appeared in the board exams highlight the competencies students were required to have after certain benchmark on curriculum standards. The findings informed high scores for remember, apply and understand levels of cognitive domain. However, miniscule value was marked for create-level, and negligible score was noted for evaluate-level, but absence of score recorded for analyze-level. This alludes to contrastive difference between first-three levels and second-three levels, and shows a propensity of prime importance to remembering and knowledge (Tsaparlis, 2020). The study of Zamir and Jan (2023) confirms the dominance

of first-half that comprised of remember, understand, and apply levels, and a negligible presence of second-half that contained create, evaluate, and analyze level of the CD-BT. Items are instrumental tools that stimulate cognitive skills of students (Aydemir & Çiftçi, 2008), however, in our case, the mental resource involved in answering these exam items lead to explicit and declarative knowledge base, and ignore procedural and metacognitive knowledge. Moreover, the results of Muhayimana, et al. (2022) also corroborate these findings.

The exam paper's items were found to be abundant in LOTS in contrast to a decreased presence of HOTS in the second section of the research investigation. The semantic layout of the items indicates total unawareness of cognitive level or item developers lack item development training. These analyses based on cognitive levels suggest lack of effective item development. Literature also confirms excessive use of low-level items (Muhayimana et al., 2022; Zamir & Jan, 2023). One of the reasons to include more LOTS in the exam items is that previous knowledge sets foundation for the higher-order learning processes because high cognitive levels such as evaluate and create can only be reached if the person gains mastery over lower-levels (Zareian et al., 2015). Thus, students with low proficiency in English may find it difficult to tackle activities of HOTS (Muhayimana et al., 2022). Many factors related to teacher's efficacy, student's motivation and interest, curriculum dynamics, and environment with social and contextual variables may hinder or boost English proficiency (Hung, 2019). Considering the argument, lower-skills and higher-skills are significant in exam items, however, a balanced approach in the item development phase can farther students' linguistic skills.

CONCLUSION

The exam is a testing tool that helps in determining the effectiveness of teaching and learning processes. Moreover, exam papers assess students for different cognitive skills at different levels by asking outcome-based questions to ascertain the potential of abilities they possess for further education and life. However, in the context of Sindh, little is known about the quality of questions in terms of their alignment with cognitive domain of the BT. To find out the cognitive levels of items. For instance, this study reported the predominant existence of remember-level of cognitive domain, and that items reflect LOTS in the board papers of English. Since, the future of nation largely depends on education, the role of English for economic development is inevitable, which requires a revision in the item-development-process to foster twenty-first century skills by enhancing the quality of items in the exam papers.

Implications

The study findings report predominance of the LOTS (95.1%) over the HOTS (4.9%) in exam items for the years 2015 to 2019. The skewed proportion between the two extremes warns against the negative washback effect of exams on the quality of education. The item assessment identifies the cruciality of the cognitive gaps for measuring students' competencies in board exams. This calls for a blueprint to develop board exam papers on curriculum-driven and cognition-oriented principles for addressing prevalent disparities. Similarly, the element of training for item-construction on national and international English language competency frameworks is pivotal in dealing with current demands of language education.

Recommendations

The findings of the study suggest that in order to ensure higher order learning levels, a comprehensive policy framework initiative is required to evaluate school exam systems including tests and exams conducted weekly, monthly, quarterly, biannually and annually. Moreover, fostering 21st century skills requires the curriculum developers to delineate skill-based competencies in the national curriculum for English subject teaching. Future studies may focus on identifying the knowledge gap of other disciplines and examine correspondence between items and relatable Bloom's Taxonomy.

Limitations & Future Research

The qualitative empirical research examined only tenth-grade items of English across five-year board papers, while a more recent study may provide robust and recent findings as due to COVID-19, the conventional exam halted until 2023. Hence, generalizability of the findings restricts its use in other

boards. However, useful insights can be learnt from the current study. Current study used content analysis technique to test tenth-grade exam items of English. Future studies may consider items in the paper of English at higher secondary level. A study on teachers' perceptions of the assessment practices at school and colleges will yield significant insights.

Competing Interest

The authors had no competing interests.

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