An Analysis of Karachi Board Papers of English from the Lens of Bloom's Cognitive Domain

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Abstract

This study aimed to analyze English examination papers of the tenth grade of the Board of Intermediate and Secondary Education (BISE), Karachi using the cognitive domain as the framework of Bloom's Taxonomy for identifying the reflection of higher-order thinking skills (HOTS) and lower-order thinking skills (LOTS). The methodology comprised positivism as the philosophical stance and the quantitative research design. The tenth-grade examination papers of English from 2015 to 2019 were the unit of analysis. The five-year papers were obtained from BISE, Karachi. A checklist was designed for analyzing exam items based on the six levels of the cognitive domain. The process of identifying item relevancy with the appropriate level of cognitive domain was grounded in the connotation and denotation meaning-making for exam items. The results reported a predominance of cognitive levels of remember, understand, and apply. Moreover, results informed of the numerousness of the LOTS in all exam papers from 2015 to 2019. The findings suggest baseline modifications in the content and purpose of board exam papers to ensure curriculum goals through student learning outcomes that involve more cognitive resources. Future researchers may consider suggesting techniques for exam-item developers to integrate the curriculum components and cognitive domain of Bloom's Taxonomy for the development of human capital.

***Keywords**: Bloom's Taxonomy, cognitive domain, HOTS, LOTS, examination, paper of English*

Introduction

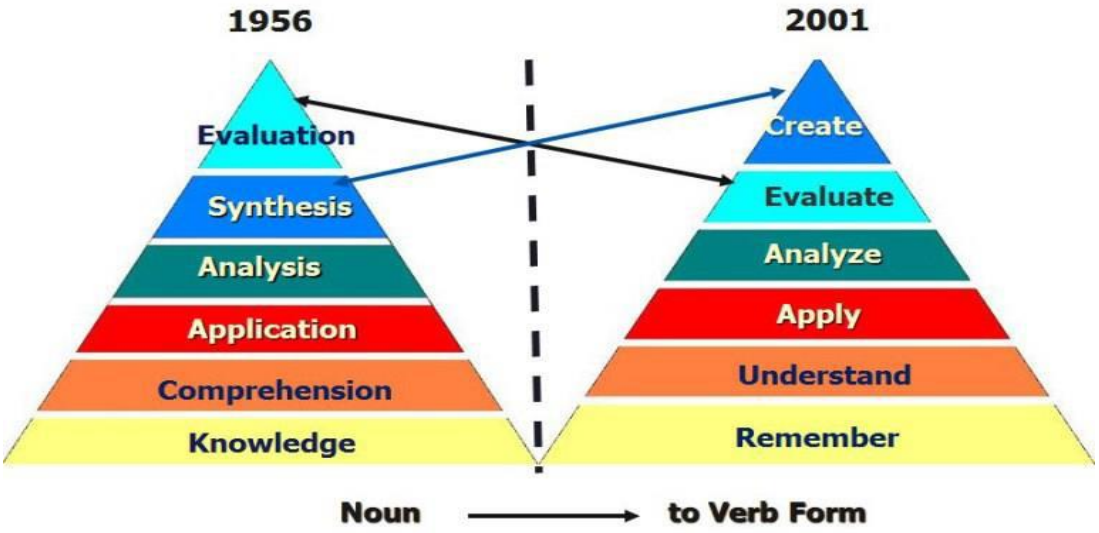
One of the traditional ways of educating young minds is to transfer the content knowledge. However, modern education necessitates teaching life skills to enable students to deal with contemporary challenges (Hadi et al., 2018). To face the new challenges, one must learn higher-order thinking skills. In terms of mental abilities, the human mind is classified into higher-order thinking skills (HOTS) and lower-order thinking skills (LOTS) (Tanujaya et al., 2017). Students with experience of HOTS can solve problems in challenging situations (Chinedu et al., 2015). New situations are entirely new circumstances in which students have never applied their knowledge and skills ever (Merta Dhewa et al., 2017). The HOTS is the component of critical and creative thinking, and teaching that HOTS help students developing more productive ideas and ideal opinion. Tanujaya et al. (2017) found a strong relationship between HOTS and students' academic performance. The HOTS are teachable and learnable, and every student needs training to think critically because the students taught to think critically are likely to succeed in academics (Chinedu et al., 2015).

The widely used tool for checking the quality of assessment that measures students' thinking skills is Bloom's Taxonomy of Educational Objectives (BT) (1956). The BT was first introduced by Benjamin Bloom and his collaborators in 1956. It was categorized into three main domains: cognitive domain, affective domain, and psychomotor domain (Forehand, 2005). The cognitive domain is based on knowledge from the lowest level of remember to the highest level of create; the affective domain is based on emotions and attitudes from the lowest level of receiving to the highest level of characterizing; and the psychomotor domain is based on physical skills, coordination, and motor-skills from the lowest level of perception to the highest level of origination (Bloom, 1956). These domains are used in the relevant categories of learning. However, this study focused on the cognitive domain of BT because of the nature of inquiry related to learning. The cognitive domain of the BT is subdivided into six different cognitive levels (Huitt, 2011). Each cognitive level represents the different thinking skills in a hierarchy (Seddon, 1978). All six levels are presented in ascending order from the LOTS to the HOTS (Saido et al., 2018). The first three levels—remember, understand, and apply constitute LOTS, while the latter three levels—analyze, evaluate, and create form HOTS (Adams, 2015). Later on, in 2001, the cognitive domain of the BT was amended by David Krathwohl and a student of Benjamin Bloom, named Lorin Anderson, with some significant changes in it (Köksal et al.,

2023). It is mostly termed as the Revised Bloom's Taxonomy (2001). The main difference between the original taxonomy and the revised taxonomy is of terminology. In the revised taxonomy, the nouns used in the cognitive levels were replaced with verbs (Darwazeh & Branch, 2015). Another amendment was made in the placement of the higher levels of taxonomy. The last level in the original taxonomy, evaluation, placed at the second last position in the revised BT, and the second last level from the original taxonomy, synthesis, was replaced with a create and positioned at the top in the revised BT (Velázquez-Iturbide, 2021). This study used the revised list of cognitive level names. The below diagram shows the comparison between the original and the revised BT.

Figure 1

The Revised Bloom's Taxonomy, Krathwohl (2002)



Note. Original Bloom's taxonomy and the revised Bloom's taxonomy

The cognitive domain of BT has been used by many authors in their research for assessing the quality of pedagogical strategies, content materials, and assessment methods. Köksal et al. (2023) used the cognitive domain of revised BT to analyze the reading sections of English as a second language (ESL) textbooks used in Turkish high schools. The results suggested that the textbooks failed to promote HOTS among students. Hassan (2023) researched the matric annual exam question papers in English; analyzed the matric curriculum for English subject and the annual examination content, and assessed the difficulty level using the cognitive domain of BT. The result informed reflection of the dominance of the lower level of the cognitive domain of BT

in exam question papers. Kaino (2013) focused on one Math module offered to the student-teachers through the open distance learning mode. The examination results of student-teachers from 2007 to 2010 were analyzed using the cognitive domain of BT. Student-teachers' performance was found better at the lower levels than the higher levels of the cognitive domain of BT. Moreover, Cullinane and Liston (2016) also used the cognitive domain of BT as a framework to analyze the examination papers of Biology for leaving certificate exams in Ireland. The study findings suggested that the lower cognitive levels were predominantly promoted than the higher cognitive levels of BT in the exam papers. Similarly, Baghaei et al. (2020) set the cognitive domain of BT at the base of the study to compare the IELTS and TOEFL reading and listening tests. The result showed that the IELTS listening test items were mainly based on remember and understand levels of BT, while the TOEFL listening test items reflected remember, understand, and analyze levels. A similar difference was found in IELTS and TOEFL reading test items. Thus, the cognitive domain utilization in education specifically exams maintains primacy for quality assurance.

Problem statement

The literature suggests that teaching and learning approaches depend on the assessment approach (Rind & Mari, 2019). Most secondary school teachers decide what to teach by keeping the annual examination in view (Chandio et al., 2016) and mainly focus on the selected contents of the textbook, holding a high chance of inclusion in the final exam question (Rind & Malik, 2019). The institutional administration binds teachers to teach the selected content to produce good results in the final exam. Teachers also prepare students using the "guess papers" with emphasis on instruction to reproduce them during board exam papers (Rind & Malik, 2019). Similarly, students follow teachers' instructions as pinnace for learning and attempting final exam questions (Chandio et al., 2016). Students study to get good grades in board exams (Bhutto & Rind, 2022). Directly or indirectly, teachers and parents compel their children to get excellent exam results (Rehmani, 2003). The existing examination system also encourages students to cram and reproduce content in the exams as better reproduction of accurate answers leads to good grades in the final exam result (Rehmani, 2003).

What if the teachers and learners follow the exam-oriented approach, would this approach develop the HOTS? The literature suggests that exam-oriented teaching-learning approaches lead

toward the LOTS (Rehmani, 2003; Rind & Malik, 2019; Rind & Mari, 2019). Most students follow one approach to learning which is cramming and reproducing the answers for securing good grades instead of centering on higher cognitive abilities (Cheng & Curtis, 2004). Therefore, the exam items are developed on the LOTS that yield only the LOTS (Zamir & Jan, 2023). This way the LOTS are promoted, but the HOTS are neglected in the exam-items as Mahroof (2021) found that the exam-items in the matric exam papers of English were developed at the lower levels of the cognitive domain of BT. Similarly, Chandio et al. (2021) claim that the items in matric English exam papers conducted by provincial BISEs, the most items reflect the lower levels but the higher levels are mostly ignored. Therefore, this study aimed to answer the following research questions:

1. What are the cognitive levels of exam-items in the matric exam papers of English conducted by the BISE, Karachi from 2015 to 2019 using the framework of the cognitive domain of Bloom's taxonomy?
2. What order of thinking do the exam-items reflect in the tenth-grade papers of English administered by the BISE, Karachi from 2015 to 2019 using the framework of the cognitive domain of Bloom's taxonomy?

A total of five autonomous examination boards are operating in Sindh, which are responsible for conducting the annual examination for secondary levels (XI-X) and higher secondary levels (XI-XII) (Malik et al., 2017). The BISE Karachi is responsible for conducting the exams from grade nine to grade-twelve and awarding transcripts and certificates. The history informs the establishment of the Board of Secondary Education (BSE) took effect after approval of "The Karachi Secondary Education Act No. XVI of 1950"; similarly, after approval from "The Sindh Board of Intermediate and Secondary Education Ordinance No. VI of 1972" and "Amendment Act No. 20 of 1973, and Amendment Act No. 1974" of the Government of Sindh, the BISE, Karachi was bifurcated into—BSE, Karachi, and BIE, Karachi; the BSE, Karachi is responsible for conducting the exams of secondary education (IX and X), and the BIE, Karachi is responsible for administering the exams of intermediate education (XI and XII) (BISEK, 2023).

Question Paper

A total of five question papers were selected from the year 2015 to 2019. The selection was based on the consistency of the exams from 2015 to 2019 to detect changes in the question

papers. Each question paper had two parts: objective and subjective. The objectives comprised the multiple-choice questions (MCQs) where students had four options to pick one of the most suitable options for each item, whereas the subjective part contained the restricted and extended response items where students had to write the answers.

Literature review

Importance of Examinations

There are two modes of the assessment process: formative and summative. The one conducted during the learning process is the formative assessment, and the one carried out at the end of the learning process is the summative assessment, specifically at the end of an academic year (Pillay et al., 2017). The summative assessment tests student achievement in the subject or topic (Khan et al., 2021). The history of the exam system in Pakistan stemmed from the British Education System in 1880; the Public Examination System still plays a crucial role in our education system (Ishaq et al., 2020). An efficient and effective examination system is essential for the success of an educational system, as it plays a vital role in the teaching and learning processes, contributing to the attainment of educational objectives (Shahid & Ambreen, n.d.). In Pakistan, the ninth and tenth-grade exams are called the Secondary School Certificate Exams (SSCE), and the eleventh and twelfth-grade exams are the Higher Secondary School Certificate Exams (HSCE). BISE administers the SSCE and HSSCE. The students from public and private sectors, NGO, and community-based schools participate in these exams. Furthermore, Cambridge International Examinations (CIE) and Edexcel International London Examinations for O Level (Ordinary level) and A Level (Advanced level) offer separate public exams at corresponding grade levels. Some prestigious private schools solely follow this system, while others have both exam systems and choose academically strong students whose parents can afford the Cambridge system. The two systems significantly differ in syllabi, subject options, exam administration, style, format of papers, reliability and credibility (Rehmani, 2003).

Despite having a prominent role in the education system, the examination process is criticized by many and is perceived negatively due to its quality and is claimed that it does not promote the quality of skills and knowledge that are most needed outside the academic environment of students (Pillay et al., 2017). Chicho and Hussein (2022) believe that the washback effect of exams can have either a positive or negative impact on students and teachers. Generally, there

might be found advantages to exams (Roediger III et al., 2011). However, mostly, exams have negative washback effects like pressure and anxiety on students (Chicho & Hussein, 2022). Similarly, teachers are pressured by institutional authorities to emphasize the exam in students (Zimmerman & Dibenedetto, 2008). The exam approach narrows the scope of learning and teaching for students and teachers because students follow a fixed set of syllabi, and prepare the chosen content that is expected to appear in the exam, similarly, teachers are bound to follow "teach for test approach" (Damankesh & Babaii, 2015). The education systems where the exam processes, like high-stakes assessments, are considered core components, ultimately fail to fulfill the purpose of education (Kirkpatrick & Zang, 2011).

Papers of Examination

Question papers are used as central tools in the education for conducting summative assessments at the end of an academic year or semester (Chomal, 2020). In some contexts, question paper is the only tool used in exams for students' achievement assessment (Kaur, 2018). As a quality measure, the question papers constructed considering Bloom's taxonomy show a balance that incorporates questions to identify the hidden skills of students (Mahroof & Saeed, 2021). Many teachers in different contexts believe that designing appropriate question papers and durable assessment results is a principled and practical thing (Allison & Gupta, 1997). Therefore, the question papers need continuous analysis and improvement in the exam process of the educational institutions for effective education (Kaur, 2018). Similarly, most examiners use complex language in the question papers that make it difficult for students to understand, and write the answer. Instead, the examiners need to comprehend that the exam is not an instructional strategy but rather the mode of communication between the student and examiner (Constantinou, 2020). Thus, making the language clear for students' understanding and answering the questions should be focused (Richardson & Lock, 1993).

Empirical Studies on Assessment

The literature is replete with contextual as well as international studies on the assessment using Bloom's taxonomy of Educational Objectives. For instance, Hassan (2023) conducted a quantitative study to analyze the alignment of the Matric English curriculum objectives and the test material with the cognitive domain of BT to determine the difficulty level of the curriculum objectives and the test content. The findings from the study suggested that in the matric annual

exam question papers of English from 2009 to 2013 years, the remember level of BT received a high weightage of 30% of items reflecting LOTS. That research recommended that the test developers of matric English need to focus on HOTS in the curriculum objectives. Moreover, Iqbal et al. (2019) conducted a quantitative study on 10th-grade physics annual exam papers from 2014 to 2018 of BISE, Rawalpindi using the BT of educational objectives. The findings of that study revealed that all exam papers gave the highest percentage to remembering level questions; the second highest percentage was given to understanding level items; and other levels were hardly present. Balance of all the levels of BT was suggested in the recommendations. The research of Fayyaz et al. (2019) aimed to evaluate master of arts in English exam papers with the application of cognitive levels of the BT. The findings informed that the lower levels received the most dominant reflection in the items (88.83%); while higher levels received less dominance (11.16%) in overall items. Mahroof and Saeed (2021) analyzed the computer science exam papers of grades 9 and 10 for 2015 and 2016 in Lahore. The study found that the majority of items touched the lower levels, and few items were based on higher levels of BT in the 2015 paper, while the higher-level items were absent in 2016 year. Karamustafaoğlu et al. (2003) researched to analyze and compare four hundred items in the chemistry exam at the schools of two Turkish cities using the cognitive domain of the BT. Results reported that 4% of the items reflected higher-order thinking skills, while 96% of items reflected lower-order thinking skills. Kalasuramath et al. (2015) studied the application of the taxonomy of verbs in Medical Physiology papers for the written exams of the final assessment of first-year Medical students. A total of 36 question papers of nine years (2006-2014) of first-year MBBS at Rajiv Gandhi University of Medical Sciences India were analyzed. Findings revealed that among all the question papers the highest ratio was given to the understanding of the BT; the second highest was remember-level and other levels were given less percentage. Qasrawi and BeniAbdelrahman (2020) based their study on the analysis of learning objectives in the Unlock English Textbooks (new and old editions) using the cognitive domain levels of the BT. Findings revealed that in both editions, the majority of the learning objectives were developed based on lower-order thinking skills i.e. understanding level. Few of them were based on the other levels of the BT. Lee (2015) studied 515 questions from Christian curricula (specifically A Beka Book and Bob Jones University Press fifth-grade reading textbooks). Results showed that the highest percentage stood for remember-level questions based on the BT, and the rest of the levels were given

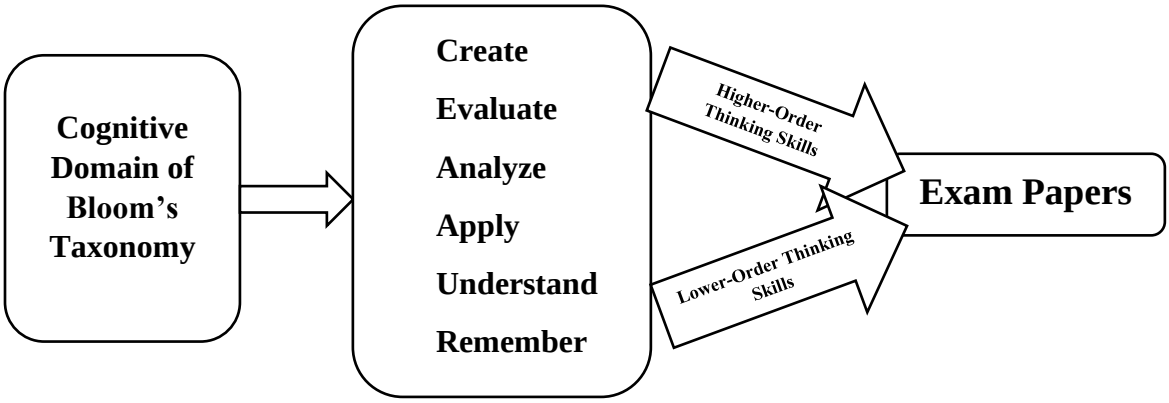
representation. The literature review shows a knowledge gap for the current study to analyze exam papers of English in the local context.

The Conceptual Framework

The study incorporated the cognitive domain of the BT of educational objectives for analyzing the items in the five-year question papers of BISE, Karachi. The BT is the framework used for the improvement of assessments, constructing exercises, developing question papers, analyzing items of exam question papers, and setting student learning outcomes. The following conceptional framework emerges from the six levels of cognitive domain of the BT grouped into HOTS and LOTS for examining the quality of exam paper items.

Figure 2

The Conceptual Framework



Methodology

Ontologically, this research is objectivist because the data driven in this study is independent of social construction and based on the quantification. The epistemological stance is positivist, which helped in data analysis and testing the variables based on numeral data (Antwi & Hamza, 2015). Moreover, this study employed the descriptive research design. This descriptive study aimed to seek information about the sample that described the fundamental relationship to understand the research questions. In a descriptive research, result presentation takes graphical or tabular representation having proportions, percentages, frequencies, or means (Tripodi & Bender, 2010, pp. 120-121). The results of this study are described in the tabular form showing percentages of exam items for the cognitive levels they represent. Finally, the research method

includes allowing information to be measured and analyzed using statistical methods. Moreover, the quantitative research method encompasses collection of several data, and researchers apply mathematical models as the fundamental approach for data analysis (Williams, 2007). This study employed quantitative measures for data collection using close observation of exam items and checking each item against the cognitive levels of the BT. Subsequent statistical analyses run to determine cognitive levels for each item. Finally, the research method includes allowing information to be measured and analyzed using statistical methods. Moreover, the quantitative research method encompasses the collection of number data, and researchers apply mathematical models as the fundamental approach for the analysis of data (Williams, 2007). This study employed quantitative measure for data collection using close-observation of exam items, and checking each item against the cognitive levels of the BT. Subsequent statistical analyses were run to determine the cognitive levels for each item.

Data Collection

The data collection grounded in the purposive sampling technique. The selected sample for the data comprised tenth-grade English exam papers from 2015 to 2019 in BISE, Karachi. The analysis process included 229 exam items. The exam items varied from 41, 42, 42, 52, and 52 for 2015, 2016, 2017, 2018, and 2019 respectively. All exam papers comprised multiple-choice questions, short-answer questions, and detailed-answer questions.

Data analysis

The study employed checklist for marking items against corresponding cognitive levels after examining connotation and denotation meaning of each item. The analyzed items were grouped and tabulated for ease of understanding for representing the same cognitive level. The table format comprised columns—part of questions paper, item number, item type, number of items, marks for each item, learning level based on the cognitive domain of the BT, and the percentage for each item.

Results

The exam paper of English in 2015 comprised three sections, 41 questions of 75 marks: A) 15 items of multiple-choice questions (MCQs) of 15 marks; B) short-answer questions (SAQs) with item a) required students to answer 8 out of 10 questions, and item b) required students to answer

4 out of 10 questions in three to four sentences; C) detailed-answer questions (DAQs) with item 3) required students to write 01 essay out of 03 topics, item 4) required students to write either application or letter, item 5) required students either to translate 5 out of 7 sentences into English or summarize a passage, item 6) required students either to read the passage and answer the questions or write a short note on 01 of out of 03 topics (Table 1).

Table 1

Karachi Board Exam Paper of English 2015

Part	Item	Type of Item	Item	Marks	Level
A	1	MCQs	15	15	R
B	2	(a) Answer any eight of the following questions	8/10	24	R
		(b) Answer any four of the following questions	4/6	12	R 04 U 01 E 01
C	3	Write an essay on any one of four topics	1/4	6	C
	4	Write and application **or** letter	1/2	6	C
	5	Translate into English	5/7	6	A
		or Make a summary of the passage	1		U
	6	Read the passage and answer the question	5	6	U
		or write a short note on any one out of three topics	1/3		C

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

Section A of the question paper began with the objective questions. Question one consisted of MCQs where 15 items were based on remember level. Section B of the question paper had subjective questions, Q2a) comprised 10 SAQs, where the items reflected remember-level. The students had a choice to select any eight out of ten to answer this question; Q2b) comprised 06 SAQs, from which students had a choice to answer any four out of six, which indicated remember-level, understand-level and evaluate-level. Section C of the question paper contained DAQs; Q3) required students to write an essay on any one out of four topics, which reflected create-level; Q4) comprised of choice between writing a letter or an application, which stood at create-level; Q5) had two choices to answer the question, 5a) comprised of translating 5 out of 7 sentence of Urdu into English, which reflected apply-level, and 5b) required students to summarize the passage, which reflected understand-level; 6a) contained a reading passage with five questions to answer, this item reflected understand-level, 6b) required students to write 01 out of 03 topics that reflected create-level of the cognitive domain of BT.

The exam paper of English 2016 comprised three sections, 42 questions of 75 marks: A) 15 items of MCQs of 15 marks; B) SAQs comprised two items: a) required students to answer 08

out of 10 questions, and b) required students to answer 4 out of 5 questions; C) DAQs contained—3) writing 01 essay out of 04 topics, 4) writing either an application or a letter, 5) translating 05 out of 08 sentences from Urdu into English or summarizing the passage, and 6) either answering questions of the reading passage or writing a short note on 01 out of 04 topics (Table 2).

Table 2

Karachi Board Exam Paper of English 2016

Part	Item	Type of Item	Item	Marks	Level
A	1	MCQs	15	15	R
B	2	(a) Answer any eight of the following questions	8/10	24	R
		(b) Answer the following questions	5	12	R
C	3	Write an essay on any one of four topics	1/4	6	C
	4	Write and application **or** letter	1/2	6	C
	5	Translate into English	5/7	6	A
		or Make a summary of the passage	1		U
	6	Read the passage and answer the question	5	6	U
		or write a short note on any one out of three topics	1/3		C

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

Section A began with MCQs where all 15 items were based on remember level; section B had subjective questions where Q2a) required students to answer 08 out of 10 items which indicated remember-level; Q2b) required students to answer 04 out of 05 items which reflected remember-level. Section C contained DAQs; Q3) required students to write essay on 01 out of 04 topics which reflected create-level; Q4) required students to either write an application or a letter which suggested create-level; Q5) offered either to translate 05 out of 07 sentences into English which suggested apply-level or summarize the passage which reflected understand-level; and Q6) required student either to opt for reading passage which reflected understand-level or write a short note on 01 out of 04 topics which indicated create-level of the cognitive domain of BT.

The exam paper of English for 2017 comprised three sections of 42 questions of 75 marks: A) objective questions, MCQs of 15 marks; B) SAQs comprised—a) required students to answer 08 out of 10 SAQs, and b) required students to answer 04 out of 06 SAQs; C) DAQs required students to answer 04 long questions (Table 3).

Table 3
Karachi Board Exam Paper of English 2017

Part	Item No.	Type of Item	Item	Marks	Level
A	1	MCQs	15	15	R
B	2	(a) Answer any eight of the following questions	8/10	24	R
		(b) Answer the following questions	4/6	12	R3 U1
C	3	Write an essay on any one of four topics	1/4	6	C
	4	Write and application **or** letter	1/2	6	C
	5	Translate into English	5/7	6	A
		or Make a summary of the passage	1		U
	6	Read the passage and answer the question	6	6	U
		or write a short note on any one out of three topics	1/3		C

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

Section A of the question paper began with 15 MCQs which suggested remember-level. Section B contained subjective questions—Q2a) required students to answer 08 out of 10 SAQs where items reflected remember-level, similarly, Q2b) required students to answer 04 out of 06 SAQs where most items reflected remember-level. Section C contained DAQs—Q3) students were required to write one essay out of 04 choices which reflected create-level; Q4) required students either to write an application or a letter which earned create-level; Q5) required students either to translate 05 out of 07 sentences into English which indicated apply-level or summarize a passage which suggested understand-level; Q6) required students either to opt for reading passage which reflected understand-level or write a short note which indicated create-level of the cognitive domain of BT. The exam paper of English in 2018 comprised three sections of 52 questions of 75 marks: A) 15 MCQs of 15 marks; B) SAQs comprised 04 questions; C) DAQs contained 04 long answer questions (Table 4).

Table 4

Karachi Board Exam Paper of English 2018

Part	Item	Type of Item	Item	Marks	Level
A	1	MCQs	15	15	R
B	2	(a) Answer any FOUR of the following questions	4/6	8	R
		(b) Answer any TWO of the following questions	2/4	4	R
	3	Explain with reference to the context (Prose)	3	6	U
	4	Explain with reference to the context (Poem)	3	6	U
	5	Fill in the blanks with suitable contextual words	6/8	6	R
	6	Use the idioms phrases in sentences	6/8	6	A
C	7	Write an essay on any one of four topics	1/4	8	C
	8	Write and application **or** letter **or** a dialogue	1/3	6	C
	9	Translate into English	5/7	5	A
	10	Read the passage and answer the questions	5	5	R 03 U 02
		or write a short note on any one out of three topics	1/3	5	C

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

Section A paper began with 15 MCQs which were based on remember-level. Section B of the question paper had subjective SAQs--Q2a) required students to answer 04 out of 06 items which reflected remember-level; Q2b) students had to answer 02 out of 04 items which indicated remember-level; Q3) required student to explain the prose with reference to the context which reflected understand-level; Q4) required student to explain the poem with reference to the context which suggested understand-level; Q5) required students to fill in 06 blanks out of 08 sentences which suggested remember-level; Q6) required students to make 06 sentences out of 08 idioms phrases which reflected apply-level. Section C had DAQs—Q7) required students to write an essay out of 04 topics, which reflected create-level; Q8) required students to write on 01 of the 03 options—letter, application, and dialogue which suggested create-level; Q9) contained 05 out of 07 sentences for translation into English which indicated apply-level; Q10) required students either to opt for reading passage which reflected more remember-level items or write a short note on 01 out of 03 topics which indicated create-level.

The exam paper of English in 2019 comprised three sections of 52 questions of 75 marks: A) objective questions, which included multiple choice questions (MCQs); B) comprised 05 short-answer questions; C) contained 04 detailed-answer questions (Table 5).

Table 5

Karachi Board Exam Paper of English 2019

Part	Item No.	Type of Item	Item	Marks	Level
A	1	MCQs	15	15	R
B	2	(a) Answer any FOUR of the following questions	4/6	8	R
		(b) Answer any TWO of the following questions	2/4	4	R 01 U 02 E 01
	3	Explain with reference to the context (Prose)	3	6	U
	4	Explain with reference to the context (Poem)	3	6	U
	5	Fill in the blanks with suitable contextual words	6/8	6	R
	6	Use the idioms phrases in sentences	6/8	6	A
C	7	Write an essay on any one of four topics	1/4	8	C
	8	Write and application **or** letter **or** a dialogue	1/3	6	C
	9	Translate into English	5/7	5	A
	10	Read the passage and answer the questions	5	5	U
		or write a short note on any one out of three topics	1/3		C

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

Part A began with 15 MCQs which were based on remember-level. Section B had subjective questions—Q2a) comprised SAQs where students had to answer 04 out of 06 items which reflected remember-level; Q2b) required students to answer 02 out of 04 SAQs which indicated remember-level; Q3) required students to explain the prose with reference to the context which reflected that more items were based on under-level (2, 1=remember, 1=evaluate); Q4) required students to explain the poem with reference to the context which indicated understand-level; Q5) required students to fill in 06 out of the blanks which reflected remember-level; Q6) required students to use make 06 sentences out of 08 idioms phrases which indicated apply-level. Section C contained DAQs—Q7) students had to write an essay on any 01out of 04 topics which reflected create-level; Q8) required students to opt for one from writing—a letter, an application, or a dialogue which suggested create-level; Q9) required student to translate 05 out of 07 sentences into English which reflected apply-level; Q10) students had choice either to opt for reading passage which suggested understand-level or write 01 note out of 04 topics which indicated create-level of the cognitive domain of the BT.

The computations for the English paper of the Karachi board exam from 2015 to 2019 report the percentage distribution for each level of the cognitive domain (Table 6). The level-wise percentage spreads across all levels i.e. remember to create. However, the results reflect the cognitive domain application in the construction of exam questions, ranging between the level-wise with the highest percentage of 58.1 for remember-level, and the lowest percentage of 0.8 for evaluate-level, whereas the placement of the analyze-level was absent in all five-year papers of English.

Table 6

The Reflection of the Cognitive Domain in the Karachi Board Papers of English

Level	2015	%	2016	%	2017	%	2018	%	2019	%	Total %
Remember	24	59	28	67	26	62	30	58	25	48	58.1
Understand	7	17	6	14	8	19	8	15	12	23	17.9
Apply	6	15	5	12	5	12	11	21	11	21	16.6
Analyze	--		--		--		--		--		--
Evaluate	1	2	--		--		--		1	2	0.9
Create	3	7	3	7	3	7	3	6	3	6	6.6

The percentage is calculated based on marks assigned to each question according to their cognitive levels. Moreover, the table indicates that the most dominant level under focus has been remember, which further proves that the rationalization for incorporating the cognitive domain has instrumental significance in student attainment.

The study also aimed to go beyond computations for eliciting item frequencies, and percent on exam papers for determining the higher order thinking skills and the lower order thinking skills. Table 7. shows the thinking levels involved in the exam papers of English.

Table 7

Results of LOTS and HOTS

Cognitive Level	*f*	%	Total %	Thinking Level
Remember	133	58.1		
Understand	41	17.9	92.6	Lower Order Thinking Skills
Apply	38	16.6		
Analyze	--	--		
Evaluate	2	0.9	7.5	Higher Order Thinking Skills
Create	15	6.6		

The average of averages was calculated which yielded a significant value of 92.6% for the LOTS, however, a partial result score of 7.5 appeared for the HOTS. These results clearly indicate the predominance of the LOTS in the exam papers than the HOTS from 2015 to 2019. This also alludes to challenges students might encounter at higher grades as with LOTS students are equipped with knowledge and disposition which is required for low cognitive resources, however, higher cognitive functions require more HOTS or at least a right-proportion of the two.

Discussion

This study aimed to analyze the learning levels and skills exam items promoted in the question papers of BISE, Karachi. The results answered the research questions by reporting that in all the question papers majority of the items reflected the lower levels of learning, and only a small number of items reflected the higher levels of learning based on the framework of the cognitive

domain of Bloom's taxonomy of educational objectives. The first finding informed that more than half of exam items were set on remember-level; understand and apply stood at the second and third level; evaluate and create levels showed a thin representation, while analyze-level was absent. Zamir and Jan (2023) reported similar results while assessing Sukkur Board exam papers in English from 2015 to 2019. A second finding of the study indicated that the learning of students through exam question papers is restricted to only lower order thinking skills, such as remember, understand, and apply while the other important aspects of the higher-order thinking skills, such as analyze, evaluate, and create were ignored (Mansoor, 2023). The study of Muhayimana et al. (2022) supports the findings of this study that in the English Primary level-six Leaving Exam administered in Rwandan schools from 2013 to 2019 the LOTS predominantly existed with 98.79% while the HOTS were only 1.21% in all exam papers. Students must ask questions beyond factual knowledge, to reach the highest levels of thinking skills (Al-hasanat, 2016). Placing fewer items based on HOTS in the exam question paper leads to the surface level of learning among students (Rind & Malik, 2019). Consequently, students fail to learn skills about analyze, evaluate, and create. The reason why the majority of items are based on LOTS is that paper setters have a lack of knowledge to develop effective questions that help students develop HOTS (Narayanan & Adithan, 2015). More recently, Zamir and Jan (2023) conducted a study on assessing matric exam papers for five years of BISE, Sukkur confirming the high-scale prevalence of LOTS. This study also suggested revamping the process of paper setting and aligning it with the competencies elicited in the curriculum. The finding contributes to the clear understating that paper setters may lack training or lack proper directions. Moreover, paper setting is significant for student grade-wise progression and cognitive development, but paper setting psychology largely hovers over its developer's knowledge and skills. For example, trained teachers consider exam papers as a learning tool, while untrained teachers see exam papers as a grading tool (López Mendoza & Bernal Arandia, 2009). So, the exam papers are vital tools for gauging students' behavioral and mental abilities, and it needs care when constructing exam items because it sets the foundation of future career path for students who join the economic system and direct it for the prosperity of the nation.

Implications

Since the exams are essential components of the education stream, and this study attempted to examine exam paper items of English for grade ten through the lens of the cognitive domain of Bloom's Taxonomy of educational objectives. The results for the cognitive and thinking levels indicated the abundance of the first three levels of the cognitive domain; simultaneously suggested the magnitude of the lower-order thinking skills. Literature confirmed similar findings in similar contexts in the previous studies, signifying the importance of the topic and the impact of exam paper setting on the academic achievement. Furthermore, the exam paper setters may seek information through this study about the instrumentality of the cognitive domain of BT. The findings suggest that the higher-order thinking skills inclusion helps students in fostering holistic cognitive development through board-wise exam papers. A rigorous training program for the item developers to construct items on behavioral terms. However, due to limited resources and the absence of alternative modes of assessment, the existing exam system has failed to map students' academic abilities. Examining exam papers can leverage these results by representing the least addressed cognitive levels in the board exam items. For example, the paper setters can use the findings of this study to ensure a set of steps for the development of exam papers on the guidelines of cognitive levels, curriculum needs, and future career hunting; despite being complex, the process of item development requires program-oriented training, and effective paper quality assurance mechanisms for achieving national goals.

Conclusion

By testing grade-ten exam paper items of English of BISE, Karachi from 2015 to 2019, this study established that exam papers lack higher-order thinking skills and an abundance of remember, understand, and apply levels. The results also suggest that while exam papers represent standards and competencies mentioned in the curriculum. However, it signifies considering wide acceptance of abilities lies in the behavioral outcomes of students, which requires adherence to the cognitive domain and its reflection in the exam items. Future researches into the analysis of the papers of English should focus on exams after 2019 to track the trends followed in exams and assessment quality systems for seeking instrumental insights. Furthermore, while this study analyzed the question papers of English in terms of their relevance

to the cognitive domain of Bloom's Taxonomy, studies are also required into math, science, and other subjects for creating knowledge base for future researchers.

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