Large Scale Assessment (LSA)

Grade 8

September 2022

Large Scale Assessment (LSA)

Grade 8

Punjab Examination Commission

Table of Contents

List of Abbreviations 7

Message from the Minister Education 8

Message from the Chief Executive Officer, PEC 9

Acknowledgements 10

Executive Summary 11

1. Introduction 14
   - 1.1. Structure of LSA under APF 14
   - 1.2. Guide to the Report 15

2. Methodological Approach 17
   - 2.1. Sampling Methodology 17
   - 2.2. Assessment Instruments 20
   - 2.3. Curriculum Content and Cognitive Levels Tested 20
   - 2.4. Quality Assurance of Assessment Instruments 21
   - 2.5. Background Data-Collection on Influencing Factors 21
   - 2.6. Standard Operating Procedures (SOPs) for Conduct and Marking of LSA 22
   - 2.7. Quality Assurance Parameters of Assessment 22
   - 2.8. Data Entry and Analysis 22

3. Major Findings 25
   - 3.1. Overall Student Performance 25
   - 3.2. Overall, Teacher Performance 38
   - 3.3. Comparative Scores: Performance of Teachers and Students 40
   - 3.4. Comparative Scores: Performance of SED and PEF Administered Schools 42

4. Recommendations 63
   - 4.1. School Education Department (SED) 63
   - 4.2. Quaid-e-Azam Academy for Educational Development (QAED) 63
   - 4.3. Punjab Curriculum & Textbook Board (PCTB) 64
   - 4.4. Program Monitoring and Implementation Unit (PMIU) 64
   - 4.5. District Education Authorities (DEAs) 64
   - 4.6. SCHOOL 64
   - 4.7. PARENTS 65

5. Conclusion 66

6. Annexes 67
   - Annex 1 – Difficult SLOs 67

List of Figures

Figure 1: Overall mean score of students 25
Figure 2: Students' Performance by Category 25
Figure 3: Subject Wise Mean Scores Achieved by Students 26
Figure 4: Overall Students' Performance 30
Figure 5: Average Student Scores Achievement in Reading Fluency 32
Figure 6: Performance of Students in Reading Fluency per Curriculum Benchmarks 32
Figure 7: Time spent to read the complete paragraph in seconds 33
Figure 8: Students Reading Correct Words per Subject - English 34
Figure 9: Students Reading Correct Words per Subject – Urdu 35
Figure 10: Performance of Students in Listening Assessment 35
Figure 11: Overall Mean Scores Achieved by Teachers 38
Figure 12: Subject-wise Mean Scores Achieved by Teachers 38
Figure 13: Overall teachers' Performance According to Subject-wise Item Types 39
Figure 14: Overall Teachers' Performance Based on Cognitive Domains 39
Figure 15: Overall Comparison of Mean Scores Achieved by Teachers and Students 40
Figure 16: Subject-Wise Comparison of Mean Scores Achieved by Teachers and Students 41
Figure 17: Overall Students' Performance in SED 42
Figure 18: Subject-wise Students' Performance in SED and PEF Administered Schools 42
Figure 19: Overall Teachers' Performance in SED and PEF Schools 43
Figure 20: Subject-wise Teachers' Performance in SED and PEF Schools 43

List of Tables

Table 1: Sample Size of Schools for LSA 2022 17
Table 2: District-wise Data: Number of Selected Schools 18
Table 3: Number of Students and Teachers Participating in LSA 19
Table 4: Type of Assessments Conducted under LSA 2022 20
Table 5: Scores Achieved in Key Cognitive Domains 26
Table 6: Overall student Performance Achieved according to Topics 29
Table 7: Overview of Reading Fluency 34
Table 8: Average Time for continuous speaking on topic in seconds 36
Table 9: Feedback on Currently Taught Textbooks 52
Table 10: Teachers taking Support for Lesson Planning 53
Table 11: Methods used by Teachers to Assess Classroom Learning 53
Table 12: Areas of discussion with Parents by Teachers 53
Table 13: Areas of Engagement in School Administration by Teachers 54
Table 14: Feedback about head teacher`s performance 54
Table 15: Topic-wise Difficulty levels in science 55
Table 16: Topic-wise Difficulty levels in Mathematics 56
Table 17: Topic-wise Difficulty levels in English 57
Table 18: Topic-wise Difficulty levels in Urdu 58
Table 19: Frequency of School Council Meetings 59
Table 20: Areas of Discussion in School Council Meetings 59
Table 21: School Council Participatory Activities 60
Table 22: Suggestions given by School Council Members 60
Table 23: Suggestions by Council Members for the usage of NSB Fund 60
Table 24: Parent Observation about their children 61
Table 25: Parent Suggestions for School Improvement 61

List of Abbreviations

ALP	Accelerated Learning Programme
APF	Assessment Policy Framework
AV	Audio-Visual
B.A.	Bachelor of Arts
B.Sc.	Bachelor of Sciences
CPD	Continuous Professional Development
CRQ	Constructed Response Question
DEAs	District Education Authorities
DLI	Disbursement Linked Indicator
ECE	Early Childhood Education
ERQ	Extended Response Question
HED	Higher Education Department
HCF	Highest Common Factor
IT	Information Technology
ITSP	Innovative Teacher Support Package
LCM	Least Common Multiple
LSA	Large Scale Assessment
M.A.	Master of Arts
MCQ	Multiple Choice Question
M.Sc.	Master of Sciences
NFBE	Non-Formal Basic Education
NSB	Non-Salary Budget
PCTB	Punjab Curriculum and Textbook Board
PEC	Punjab Examination Commission
PEF	Punjab Education Foundation
PISA	Programme for International Student Assessment
PIRLS	Progress in International Reading Literacy Study
PMIU	Programme Monitoring and Implementation Unit
PPP	Public Private Partnership
PRP	Pakistan Reading Project
PTM	Parent Teacher Meeting
RRQ	Restricted Response Question
QAED	Quaid-e-Azam Academy for Educational Development
SBA	School Based Assessment
SED	School Education Department
SIS	School Information System
SLO	Student Learning Outcome
SNC	Single National Curriculum
SOPs	Standard Operating Procedures
SRP	Sindh Reading Programme
STR	Student-Teacher Ratio
TA	Technical Assistance
TFM	Teacher Forum Meeting
TIMMS	Trends in International Mathematics and Science Study
ToS	Table of Specification
WB	World Bank
WPM	Word per Minute

Message from the Minister Education

We introduced the new assessment regime under the Assessment Policy Framework (APF) in 2019. The APF is aligned with our government's strategic vision for education, given in the document New Deal for Education 2018-23. It is a part of the education reforms that we have introduced in the province for improved student learning outcomes since 2019.

Under the APF 2019, Punjab Examination Commission (PEC) has been mandated to implement both, School Based Assessments (SBA) for school and classroom level improvements along with Large Scale Assessments (LSA) for strengthening of the overall system.

It is my pleasure to announce that this year, PEC has successfully completed in entirety it's mandated role in the field of assessment, especially in LSA of grade 8, and in achieving quality education through assessment (as SDG-4). LSA for Grade-8 has been conducted on the 2006 Curriculum, and it has provided results of students in four major subjects: Mathematics, English, Urdu and Science. Under the assessment, data on external factors which affect the quality of education for students has also been collected and analyzed.

I have also been informed that the PEC, while continuing and adding to its efforts in its mandate for assessment, is aligning all SLOs included in the 2006 Curriculum with the Global Proficiency Framework (GPF) along with the draft of the National Curriculum. I am certain that this report will provide us with the evidence needed to make critical decisions for the betterment and improvement of our education system in Punjab.

I encourage the School Education Department (SED) and it's attached provincial departments: Punjab Curriculum and Textbook Board (PCTB), Quaid-e-Azam Academy for Educational Development (QAED), the Program Monitoring and Implementation Unit (PMIU) along with the public private partners of Punjab: Punjab Education Foundation (PEF) to study the findings of this assessment and work together on new interventions needed for improved student learning outcomes and informed decision making in the areas where it is needed the most. Results of the LSA of Grade-8 can also be used to inform critical stakeholders such as parents, students, civil society and the District Education Authorities (DEAs) of the Province of Punjab about the factors affecting students' progress and the quality of education.

The contributions of the Punjab Examination Commission for the execution of the LSA Grade-8 and development of this report in Punjab are greatly appreciated. I am hopeful that this report will be immensely useful and valuable in order for us to strengthen and carry out improvement in the quality of our education delivery in the province.

Dr. Murad Raas

Minister for School Education Department, Punjab

Message from the Chief Executive Officer, PEC

Under Assessment Policy Framework (2019), Large Scale Assessment (LSA) is one of the fundamental components having very distinctive features for all stakeholders in the Education sector. Punjab Examination Commission in academic year 2022, conducted LSA for Grade-8 encompassing the Accelerated Learning Program (ALP), based on the 2006 curriculum and draft National Curriculum, to set up a benchmark of learning at elementary level for the Province.

I am pleased to report that Punjab Examination Commission (PEC) achieved milestone as it broadened its scope in LSA-2022 for Grade-8 strategically across all thirty six districts of Province of Punjab through a robust sampling process including representation of SED and PEF-sponsored private schools. In LSA of Grade-8, we have assessed the core areas of literacy, numeracy and scientific skills through evaluation of their learning in cognitive domains of English, Mathematics, Science and Urdu as included in the curriculum of 2006. I would like to express my deepest appreciation to my team at PEC for utilizing their expertise for the inclusion of skills addressing the psychometric domain this year, in addition to assessing reading and listening and speaking and being able to give comprehensive feedback to the allied organizations and education system itself.

I am deeply indebted to UNICEF for the financial assistance enabling to prepare this report. Extending my gratitude to the School Education Department (SED), Quaid-e-Azam Academy for Educational Development (QAED), Punjab Curriculum and Textbook Board (PCTB), Program Monitoring and Implementation Unit (PMIU), District Education Authorities (DEAs) and Punjab Education Foundation (PEF) for their instrumental role in development and execution of the LSA of Grade-8.

I am pleased to inform you that specific excerpts from this report accrediting to curriculum and textbooks, teachers' capacity building through training programs, quality of Private-Public Partnership (PPP) schools, district performance and other Policy issues and requisite recommendations will be shared with all allied departments and stakeholders i.e. School Education Department (SED), Quaid-e-Azam Academy for Educational Development (QAED), Punjab Curriculum and Textbook Board (PCTB), Program Monitoring and Implementation Unit (PMIU), District Education Authorities (DEAs) for future Policy considerations and actionable decision for a holistic quality improvement of the education in the Province of Punjab, I would like to extend my appreciation for Dr. Shahzad Jeeva, convener Academic and Technical Committee for his untiring efforts and guidance to lead the activity. Role of PEC members in the leadership of Chairperson Prof. Dr. Uzma Quraishi and their decisive role in its implementation is commendable.

Punjab Examination Commission team is highly motivated for their future vision intending to conduct an assessment of Grade-8 again after a period of 2-3 years for which the results included in this report will be used as the benchmark against which Academic performance of the students will be gauged in upcoming years. We also intend to align the upcoming LSA with Global Proficiency Framework (GPF) to analyze and report students' proficiency on SDG Indicator 4, which is the proportion of students reaching global minimum proficiency in reading and mathematics to compare, aggregate, and track assessment results on a global basis. Good luck to my team.

Tariq Iqbal

CEO, PEC

Acknowledgements

This report would not have been possible without the valued contribution of many people and institutions. PEC team acknowledges all stakeholders for their invaluable time and effort.

We are highly grateful for the support and contributions of the School Education Department (SED) and other provincial education departments such as Quaid-e-Azam Academy for Educational Development (QAED), Punjab Curriculum and Textbook Board (PCTB), 36 District Education Authorities (DEAs), Punjab Education Foundation (PEF) and Programme Monitoring and Implementation Unit (PMIU).

PEC acknowledges and appreciates the commendable inputs of all private sector experts, academicians and teachers from both private and public schools that have contributed in the development of the instruments for Large Scale Assessment (LSA) and its successful implementation.

We express our sincere gratitude towards UNICEF for providing financial support for the preparation of this report. We are also indebted to the collaborative efforts of our team of researchers and experts at PEC (Tariq Iqbal, Iftakhar Hassan Butt, Dr. Muhammad Azeem, Mahboob Ahmed, Muhammad Imran Sarwar, Muhammad Awais, Kamran Khan, Muhammad Irfan and other colleagues from PEC) along with our consultant Sajjad Aslam for the development of this report.

Executive Summary

With the notification of the Assessment Policy Framework (APF) in 2020, the Punjab Examination Commission has initiated the implementation of all three types of assessments, i.e., 1) school-based summative assessment, 2) school-based formative assessment and 3) large-scale assessment.

The first LSA 2021 was conducted for Grade 5. Following the APF implementation plan, PEC has conducted LSA for Grade 8 in May 2022.

Grade-8 LSA 2022 provides the system with overall feedback on student performance for teacher development and training improvements, curriculum and textbooks and related policy considerations. This report presents an overview of all the processes used from designing the LSA to its eventual conduct and results, i.e., sampling methodology, design of the assessment instruments and background questionnaires, findings and recommendations to various stakeholders.

The findings include (i) the overall performance of students, (ii) a comparison of scores with teachers and (iii) between students of schools of different organizations (SED and non-SED).

Regressions have also been run to understand the (iv) relationship of students' scores with factors that influence learning; and (v) feedback of school-based actors such as teachers and school councils.
PEC designed Grade 8 LSA through a consultative process with private and government school teachers, academics and relevant experts from all government education departments such as QAED, PCTB, PMIU and PEF.

Based on best international practices and National Curriculum 2006, PEC followed the assessment cycle in developing two assessment instruments:

- Assessment papers for English, Urdu, Science and Mathematics
- Background questionnaires for head-teachers, teachers, school council members, and parents-students (to collect information about school and classroom pedagogies).

The assessment was conducted in May 2022 on a representative stratified sample of 3300 schools across 36 districts of Punjab. The sample consists of two types of schools according to their administrative arrangement -School Education Department (SED) and Punjab Education Foundation (PEF).

PEC trained test administrators and makers on the SOPs for conduct and marking. The multiple-choice questions (MCQs) were marked by optical mark recognition (OMR), whereas the constructed response questions (CRQs) were marked using the syndicate marking process. PEC monitored the whole process along with the SED officials.

PEC hired a firm for data entry and analysis. Both descriptive and regression analyses were carried out, and only significant results were included in the report.
Findings informed that:

a. The overall mean score achieved by the students is 67%. Female students achieved 68%, while male students achieved 67% mean scores overall.

b. The overall subject-wise scores achieved by the students are 65% English, 64% mathematics, 66% science and 75% Urdu.
c. Subject-wise scores show that female students achieved 65%, 64%, 66%, and 76% mean scores in English, Mathematics, Science, and Urdu, respectively. Whereas male students achieved 64%, 64%, 66% and 75% in the subjects of English, Mathematics, Science, and Urdu, respectively.
d. Overall, students had higher percentage scores in MCQs than CRQs.
e. Students scored least in the questions testing application as compared to knowledge and comprehension level question.
f. For reading fluency assessments, 56% of students achieved a mean score (157-word count per minute) in Urdu, and 45% of students achieved a mean score (113-word count per minute) in English.
g. In listening assessments, students can achieve 87% and 77% in Urdu and English, respectively.
h. In the speaking assessment, most students could speak for 68 to 77 seconds in English and 73 to 80 seconds in Urdu. However, the students performed better when they selected the topic themselves.
i. The overall mean score achieved by teachers is 78%. Female teachers achieved 77%, whereas male teachers achieved 78% in assessments. Overall mean scores of teachers in the subjects are 75%, 79%, 76%, and 81% in English, Mathematics, Science and Urdu, respectively.
j. The overall achievement of students is 68% in SED and 66% in PEF administered schools. Subject-wise breakdown of scores shows that:
    a. In English, students of SED and PEF scored 65% and 63%, respectively.
    b. In Mathematics, students of SED and PEF scored 65% and 61%, respectively.
    c. In Science, students of SED and PEF scored 67% and 65%, respectively. While In Urdu, students of both SED and PEF scored 76% and 75%, respectively.
    d. The overall achievement of teachers is 78% and 76% in SED and PEF schools, respectively.
k. The factors that influence students learning significantly are:
    a. The academic and professional qualifications of teachers, their training, healthy teaching practices in the classroom, and their friendly behaviour have a significantly positive impact.
    b. Opportunities to participate in co-curricular activities, use of curriculum and teachers' guides, utilization of the non-salary budget (NSB) and parents' qualifications also positively and significantly impact a child's learning.

Based on the findings, the recommendations are provided in the last section according to the mandate of key stakeholders to improve the overall quality of education in the province.

Introduction

1. Introduction

The Assessment Policy Framework (APF) has provided a comprehensive assessment framework for the province that aims to improve instructional practices and students' learning outcomes by giving feedback to the system for making evidence-based decisions.

Using a phase-wise approach, the Punjab Examination Commission has initiated APF implementation by incorporating internationally established best practices in all three complimentary interlinked assessment systems; (1) large-scale assessment (LSA) that provides system-level information for improved policy decisions, (2) school-based assessment (SBA) that gives feedback for school-based changes and, (3) formative assessment to get consistent classroom-level feedback for the teacher to change and improve teaching and learning practices continuously.

Large Scale assessments (LSA) provide information on overall levels of student achievement in the system for a particular curriculum area and at a specific grade level.

Literature shows us that these assessments vary globally in terms of school grades and age levels tested, population coverage, subjects and skills coverage, frequency, test administration, collection of background data and reporting and use of results.

LSA has a two-fold purpose per its intended design:

(i) To assess language (both Urdu and English), mathematical and scientific skills at elementary level

(ii) To collect background information on external factors influencing the learning of students.

1.1. Structure of LSA under APF

The APF provides the overall structure for all system-level LSAs. The key components and structure have been developed by PEC following a rigorous consultative process. The final design of the assessment has been drafted, considering the best international assessment models conducted globally; the Programme for International Student Assessment (PISA), Trends in International Mathematics and Science Study (TIMMS) and the Progress in International Reading Literacy Study (PIRLS).

Key components of the LSA include:

1. Composition of Assessment:

a. Assessment of Literacy and Numeracy Skills at the primary level and cover additional subjects as directed by SED.

b. Assessment of knowledge and key skills of core subjects at the middle level and ultimately cover additional subjects as directed by SED.

2. Population Coverage:

The assessments will cover selected students through a representative stratified sample of schools, students, teachers, and any other target audience/points per the assessment requirements.

3. Curriculum Coverage:

a. Literacy Skills (English and Urdu Languages) and Numeracy (Mathematical Skills) for the primary level.
b. Selected (prioritized) and measurable SLOs in core subjects at the middle level (to be added in the future).

4. Output:

LSA aims to achieve the following:

a. Scores for Literacy and Numeracy for primary school sampled students.
b. Scores in core subjects' knowledge and key skills/disciplines/ competencies assessed for sampled students from middle schools will be introduced in the future.
c. Identification of factors influencing learning experience.
d. Reporting of Results: Reporting of student scores in percentage and mean scores.

The first LSA was conducted for Grade 5 in 2021, followed by LSA for Grade 8 in 2022 on the provincial curriculum of 2006 to evaluate student learning outcomes.

Grade 8- LSA has been designed following international best practices and a comprehensive development process, including private and government school-teachers, academics and relevant experts from all government education departments such as the Quaid-e-Azam Academy of Educational Development (QAED), Punjab Curriculum and Textbook Board (PCTB), Programme Monitoring and Implementation Unit (PMIU) and Punjab Education Foundation (PEF). It was administered to a representative stratified sample of 3300 schools across 36 districts during May 2022. This report provides the key insight and evidence gained on student and teacher performance.

1.2. Guide to the Report

Grade-8 LSA 2022 Main Findings report is organized into three chapters:

Chapter 1 introduces the implementation and structure of the Large-Scale Assessment under the Assessment Policy Framework.

Chapter 2 outlines the methodology followed in the development of the LSA 2022. It enumerates the sampling methodology, assessment instruments, background data-collection instruments and the analysis techniques used.

Chapter 3 details the assessment results. A specific section on key highlights is already given at the start of the report in the Executive Summary. The detailed assessment data is further divided into three parts:

I. Overall performance of students, including a comparison of scores with teachers and between students at different schools (SED and PEF).
II. Relationship of students' scores with critical influencing factors.
III. Feedback from school-based actors such as teachers and school councils.

Chapter 4 provides recommendations for different departments for the use of LSA findings.

About the Large Scale Assessment (LSA) 2022

2. Methodological Approach

This chapter provides the methodology followed in the development of the LSA 2022. It enumerates the sampling methodology, assessment instruments, background data-collection instruments and the analysis techniques used.

2.1. Sampling Methodology

Study Population: The population of this study consists of all SED & PEF schools in 36 districts of the Punjab province.

Composition of Sample: Two types of schools are included per their administrative arrangement - SED and PEF.

Sample Size: Considering the characteristic of variability for which estimates needed to be prepared, population distribution and reliability constraints, different sample sizes for each type of school were computed and fixed. In total, a sample of 3,300 schools was estimated. The following sample sizes were selected to provide reliable estimates of key variables at both district (SED schools) and provincial levels PEF schools:

Table 1: Sample Size of Schools for LSA 2022

Sr. #	LSA Grade	Number of Schools (SED & PEF)	Number of Students per School	Number of Teachers per School
1.	8	Total=3300 (SED=2618, PEF=682)	5-20	1

Sample Distribution: A random stratified PPS sampling method is used for conducting LSA. Following are the key features of the sample distribution among districts and schools etc.:

- A minimum of 20 schools per stratum (Boys and Girls) were selected from each district.
- A maximum of 20 students were selected from each school.
- The maximum number of selected schools from each district was 50 per stratum (Boys & Girls).
- At least 400 students were selected from boys' and girls' schools to make valid and reliable inferences at the district level.
- Explicit stratification was done based on district and students' gender only.

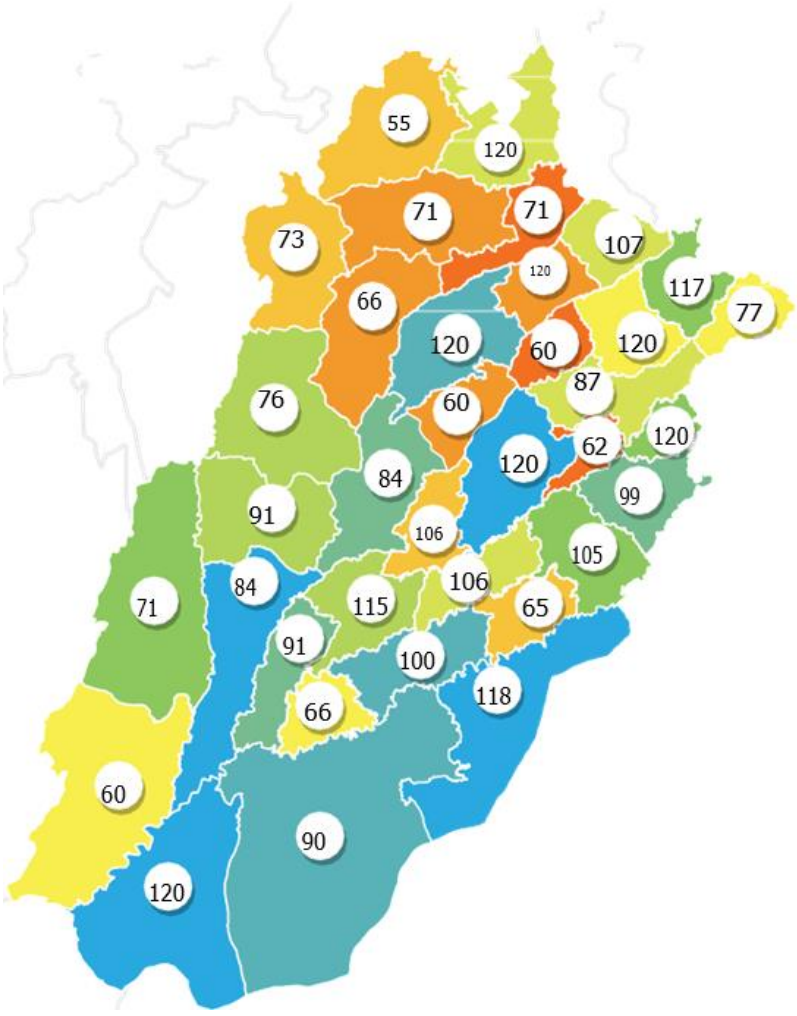


Table 2: District-wise Data: Number of Selected Schools

Districts	PEF	SED	Total	Districts	PEF	SED	Total
Attock	17	79	96	Lodhran	20	46	66
Bahawalnagar	20	98	118	M.B. Din	19	52	71
Bahawalpur	20	76	96	Mianwali	20	53	73
Bhakkar	20	56	76	Multan	20	71	91
Chakwal	20	80	100	Muzaffargarh	20	64	84
Chiniot	20	40	60	Nankana Sahib	20	42	62
D.G. Khan	20	51	71	Narowal	20	57	77
Faisalabad	20	100	120	Okara	20	85	105
Gujranwala	20	100	120	Pakpattan	20	45	65
Gujrat	20	87	107	Rahimyar Khan	20	100	120
Hafizabad	4	56	60	Rajanpur	20	40	60
Jhang	20	64	84	Rawalpindi	19	101	120
Jhelum	4	67	71	Sahiwal	20	86	106
Kasur	20	79	99	Sargodha	20	100	120
Khanewal	20	95	115	Sheikhupura	20	67	87
Khushab	20	46	66	Sialkot	20	97	117
Lahore	19	101	120	T.T.Singh	20	86	106
Layyah	20	71	91	Vehari	20	80	100
				Total	**682**	**2618**	**3300**

Table 3: Number of Students and Teachers Participating in LSA

Districts	Student			Teacher		
	PEF	SED	Total	PEF	SED	Total
Attock	231	1305	1536	52	241	293
Bahawalnagar	339	1848	2187	66	370	436
Bahawalpur	299	1300	1599	63	232	295
Bhakkar	344	1030	1374	76	204	280
Chakwal	281	1305	1586	65	272	337
Chiniot	346	750	1096	70	144	214
D.G. Khan	279	862	1141	51	147	198
Faisalabad	384	1860	2244	71	341	412
Gujranwala	342	1871	2213	70	358	428
Gujrat	205	953	1158	61	273	334
Hafizabad	60	1018	1078	13	179	192
Jhang	352	1137	1489	71	230	301
Jhelum	78	1214	1292	16	248	264
Kasur	170	922	1092	61	256	317
Khanewal	361	1715	2076	71	349	420
Khushab	279	772	1051	57	139	196
Lahore	366	1855	2221	38	234	272
Layyah	339	1266	1605	77	258	335
Lodhran	371	760	1131	78	165	243
M.B. Din	327	882	1209	71	191	262
Mianwali	359	875	1234	67	186	253
Multan	312	1164	1476	71	220	291
Muzaffargarh	302	895	1197	65	187	252
Nankana sahib	290	704	994	30	74	104
Narowal	396	996	1392	58	139	197
Okara	320	1479	1799	71	285	356
Pakpattan	359	832	1191	71	123	194
Rahimyar khan	312	1301	1613	44	217	261
Rajanpur	384	634	1018	70	138	208
Rawalpindi	364	1740	2104	55	331	386
Sahiwal	367	1578	1945	62	301	363
Sargodha	344	1746	2090	72	336	408
Sheikhupura	290	1076	1366	66	169	235
Sialkot	390	1705	2095	58	327	385
T.T.singh	249	1285	1534	62	254	316
Vehari	388	1373	1761	67	291	358
Total	**11179**	**44008**	**55187**	**2187**	**8409**	**10596**

2.2. Assessment Instruments

LSA 2022 uses two instruments:

Assessments (Test papers) for languages (Urdu and English), mathematical and scientific skills

Background questionnaires for head- teachers, teachers, school council members, parents, and students

Type of assessment instruments: The assessment papers (test papers) are further divided by type. The students of Grade 8 have been assessed using four types of instruments:

Table 4: Type of Assessments Conducted under LSA 2022

Sr. No.	Type of assessment Instrument	Used in the testing of
1	Listening (Oral)	Languages (English and Urdu)
2	Speaking	Languages (English and Urdu)
3	Reading Fluency (Oral)	Languages (English and Urdu)
4	Curriculum/SLO knowledge (Written)	Languages (English and Urdu), Mathematics and science

2.3. Curriculum Content and Cognitive Levels Tested

LSA 2022 focuses on assessing language and mathematical skills and understanding different scientific concepts and their application in daily life as presented in the provincial curriculum. This includes competencies, key learning areas and learning strands, respectively.

A summary of curriculum weightage and cognitive levels for each subject is given below:

Subject: English

Content Area	Weightage
Oral Communication	10%
Reading and thinking skills	10%
Writing	25%
Formal and Lexical aspects	55%

Cognitive Levels of Selected SLOs			
SLOs	Knowledge	Comprehension	Application
48	17%	50%	33%

Subject: Urdu

Content Area	Weightage
Listening	5%
Reading	25%
Writing / Creative writing	44%
Language cognition	21%
Life skills	5%

Cognitive Levels of Selected SLOs			
SLOs	Knowledge	Comprehension	Application
45	11%	82%	7%

Subject: Mathematics

Content Area	Weightage
Number and operation	40%
Algebra	25%
Measurement and geometry	20%
Trigonometry	7%
Information Handling	8%

Cognitive Levels of Selected SLOs			
SLOs	Knowledge	Comprehension	Application
42	12%	43%	45%

Subject: Science

Content Area	Weightage
Life Sciences	37%
Physical Sciences	49%
Earth and space sciences	14%

Cognitive Levels of Selected SLOs			
SLOs	Knowledge	Comprehension	Application
46	35%	52%	13%

PEC followed a consultative process with PCTB, QAED, and practicing teachers from private and public schools to prioritize SLOs for each subject. All SLOs included have undergone a thorough review process by the experts before final selection.

2.4. Quality Assurance of Assessment Instruments

All assessments have undergone quality controls set by PEC. In addition, the validity and reliability of the assessment have been checked under the institutional processes and protocols established by the organization.

The Table of Specification (ToS) was followed to develop subject-specific test items. All developed test items underwent testing for their psychometric properties. PEC assessment and research staff used the ITEMAN and Xcalibre software to assess the items psychometrically and created the final instruments using only those items that demonstrated robust psychometric properties. PEC developed clear and specific guidelines for use by teachers for language assessment as it catered for all four skills, i.e., listening, speaking, reading and writing. Finally, PEC developed a comprehensive marking scheme for the assessments. PEC conducted an online test for the selection of assessment markers and then they were given an online training on how to mark the assessments. PEC reviewers randomly checked the 10% assessments marked by the trained assessment markers for quality assurance. Only the selected assessment markers were engaged for the final assessment e-marking. The PEC team also kept reviewing the assessments marked by the selected assessment markers throughout the assessment.

2.5. Background Data-Collection on Influencing Factors

While the assessment instruments are designed to collect information on academic performance, additional factors such as socioeconomic status, household set-up, interests in learning, etc., are equally important. For this purpose, the LSA covers the use of comprehensive background questionnaires that can provide information about school and classroom pedagogy and other factors affecting students` learning.

Information under the assessment has been collected at three levels which are as follows:

i. Home-related factors
ii. School-related factors
iii. Classroom-related factors

2.6. Standard Operating Procedures (SOPs) for Conduct and Marking of LSA

PEC has led the implementation of LSA 2022 with its core team and staff of SED. Test administrators nominated from schools were significant actors engaged in the conduct of the assessment at the school level. To assist the administration team, comprehensive SOPs detailing steps for conduct and marking of assessment were developed. The SOPs provide defined roles and responsibilities for each stakeholder engaged in conduct and marking activities.

PEC trained all the test administration team about their supervisory responsibilities through a 1-day workshop. The training was carried out with all teams across the 36 districts.

Required material packs were provided with detailed instructions, research tools and relevant stationery for students and test administrators to ensure smooth conduct of the assessment.

Similarly, all teachers engaged in the assessment marking were provided training for using the rubrics and related materials for CRQs, whereas MCQs were marked through OMR.

2.7. Quality Assurance Parameters of Assessment

For quality assurance, PEC and monitors from the SED and the 36 District Education Authority (DEA)s conducted spot checks and visits across the province. PEC created a provincial control room to assist the monitors and resolve all issues arising in the field. Test administrators and monitors could contact the PEC staff anytime during the conduct. While marking, PEC subject specialists conducted regular checks to ensure the accuracy of the marking process.

2.8. Data Entry and Analysis

PEC engaged a third party for data entry and analysis. LSA data has been analyzed using appropriate analytical techniques and respective statistical tests relevant to the nature of the variables. These include:

i. Cross Tabulation
ii. Descriptive Analysis
iii. Multiple Regression Analysis

The results in form of cross tabulation disaggregated by student`s gender, teachers` gender, performance categories (MCQs and CRQs) and subject are explained in detail in Chapter 3 of this report.

The relationship between the student scores and individual attributes were assessed using multiple regression models. The dependent variable i.e. students` scores is scale variable, whereas, the individual attribute variables are of different nature. The Consultants treated individual attributes (here independent variables) as per their nature in the multiple regression model. For example, teacher's experience in years was treated as a scale variable. Gender of a teacher, which is a categorical variable, was treated as a binary/dichotomous variable where one variable option/category was coded as 1 and the other one was coded as 0 for comparison category. This technique made binary/dichotomous categorical variables into scale variables. There was a one true nominal categorical variable like 'classroom teaching practices' which has 9 categories. The one way of handling such variable was to make 8 dummy variables. However, a different more convenient and

simplest approach was adopted to handle this variable. Instead of making 8 dummy variables, a simple weighing was used. For example, if 6 out of 9 teaching practices were followed then a score of 6 was allotted. Similarly, if 9 practices are being practiced in a classroom than a score of 9 was allotted. In a nutshell, instead of checking impact of each of 9 practices individually, a holistic accumulative approach of how many of the teaching practices are being practiced/adopted in a classroom was employed.

The magnitude of effect of each of individual attribute on student score along with its significance/insignificance is reported in a table form. It is pertinent to note that only the significant coefficients are interpreted in the detailed analysis. However, some very important but insignificant results are also narrated irrespective of their statistical insignificance. The multiple regression follows the t-distribution by default to assess the significance/insignificance of any coefficient. Only the p-values less than 1%, 5% or 10% were reported. The significance of the coefficients was also mentioned while interpreting the results.

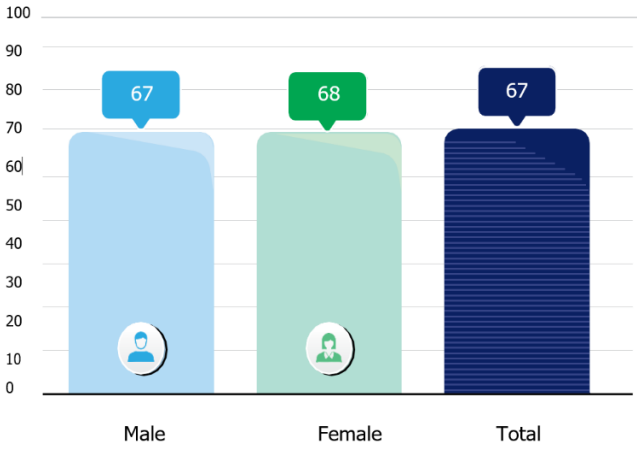
Findings

3. Major Findings

LSA 2022 Grade-8 was conducted in 3,300 schools of SED and PEF. The results of the assessment are given in detail in this chapter.

3.1. Overall Student Performance

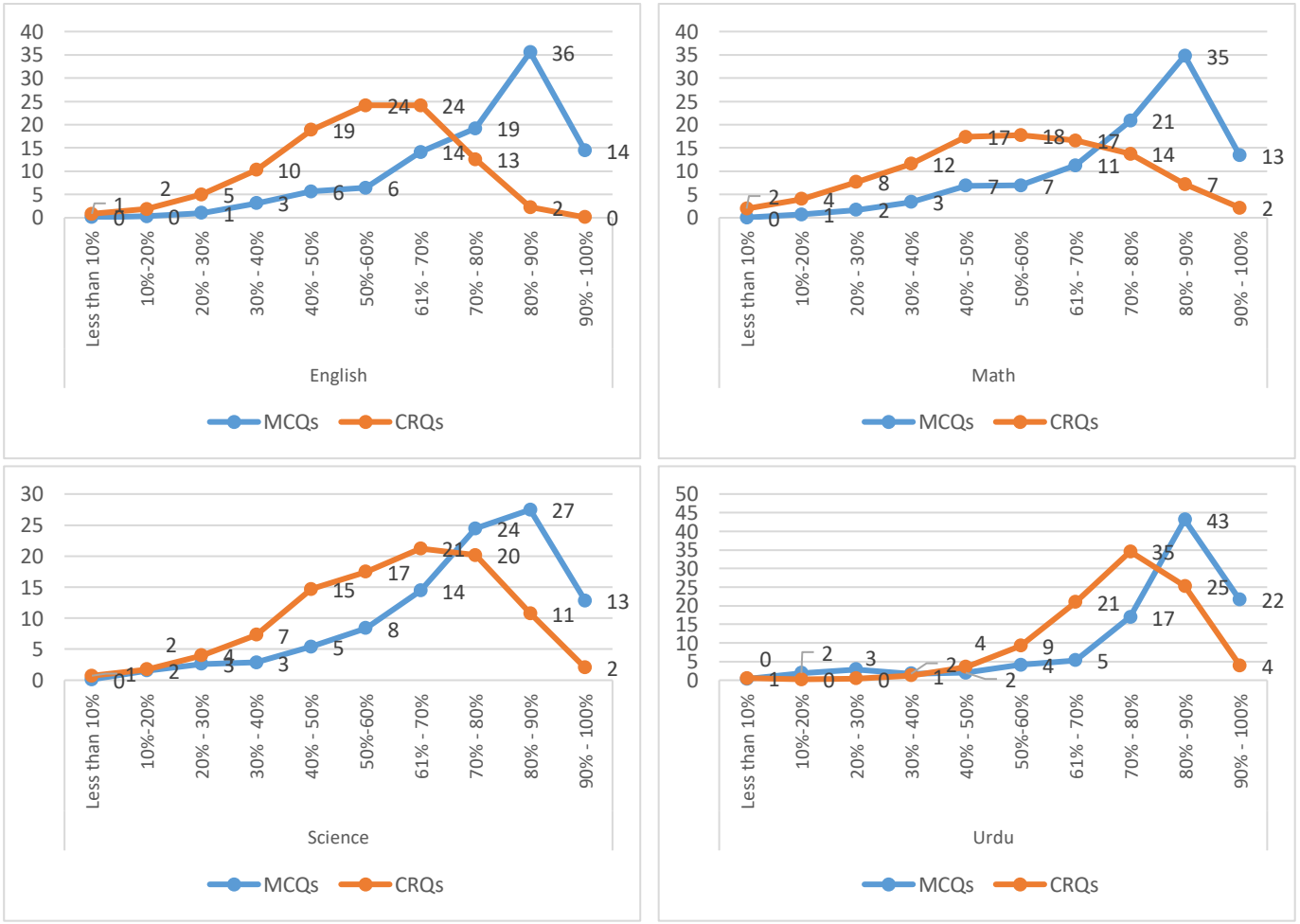
Figure 1: Overall mean score of students



Results show that overall, students scored 67% in the assessment. Females scored 1% higher than males.

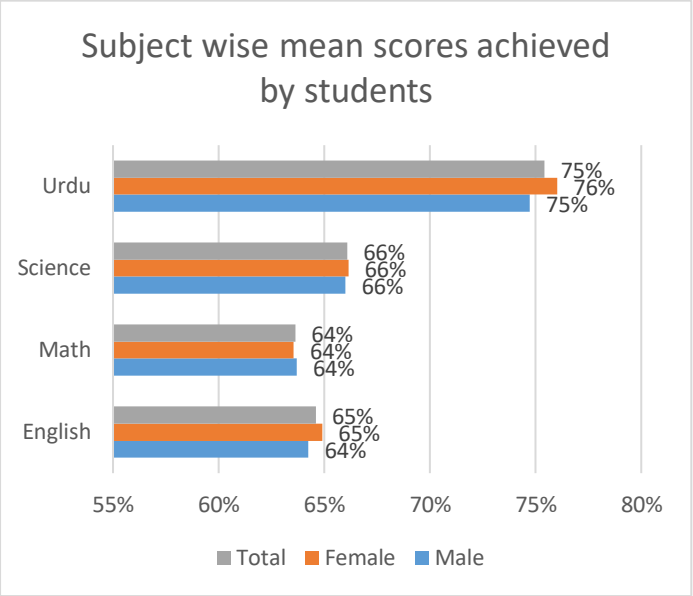
In the following graphs, ten categories have been defined to understand the students' performance. The following subject-wise graphs depict that in MCQs, the students' performance is in the highest percentages category, i.e., between 70% to 100%, as compared to CRQs, except in Urdu, where it follows the same pattern. The graphs also showed that students in all four subjects scored higher in MCQs than CRQs.

Figure 2: Students' Performance by Category



3.1.1. Subject-wise Performance

Figure 3: Subject Wise Mean Scores Achieved by Students



Results show that the overall mean score in each subject is more than 50%; however, the range is 54% to 76%. The mean score for Urdu is the highest, whereas the mean score for mathematics is the lowest. However, English and Science scores are also closer to the lowest score

Findings also inform that performance of females and males is relatively similar across subjects except in Urdu and English, where female students scored 1% higher than male students.

3.1.2. Performance under Targeted Cognitive Domains

The table below shows the scores achieved in each subject's key cognitive domains of Knowledge, Application and Comprehension.

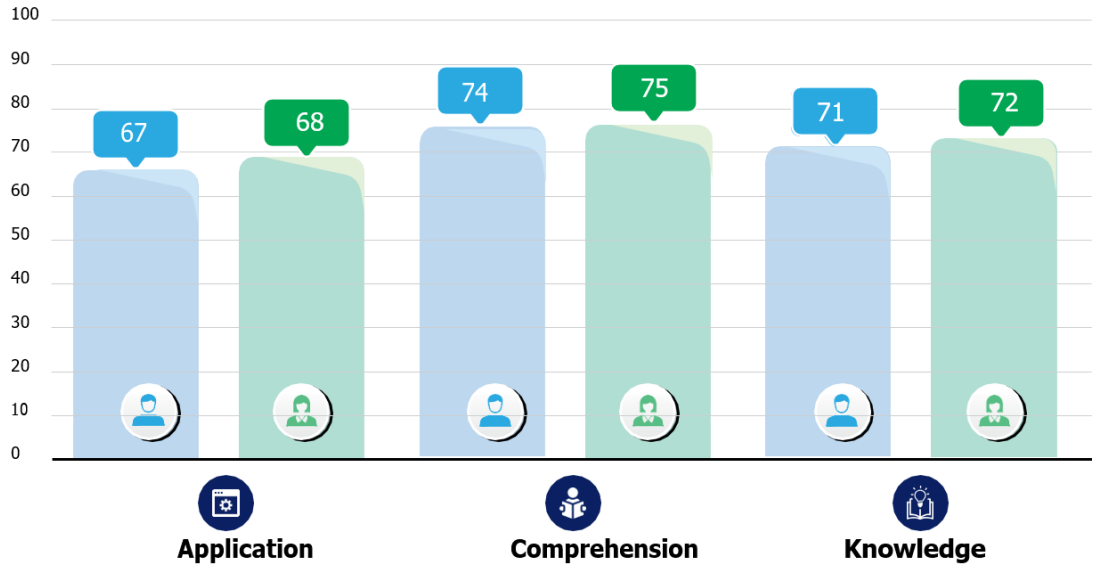
Table 5: Scores Achieved in Key Cognitive Domains

Subjects	Knowledge	Comprehension	Application
Mathematics	75%	73%	60%
Science	68%	65%	59%
Urdu	67%	77%	69%
English	71%	75%	68%

The comparison in the following graph shows that students scored higher in questions testing knowledge and comprehension than in application level.

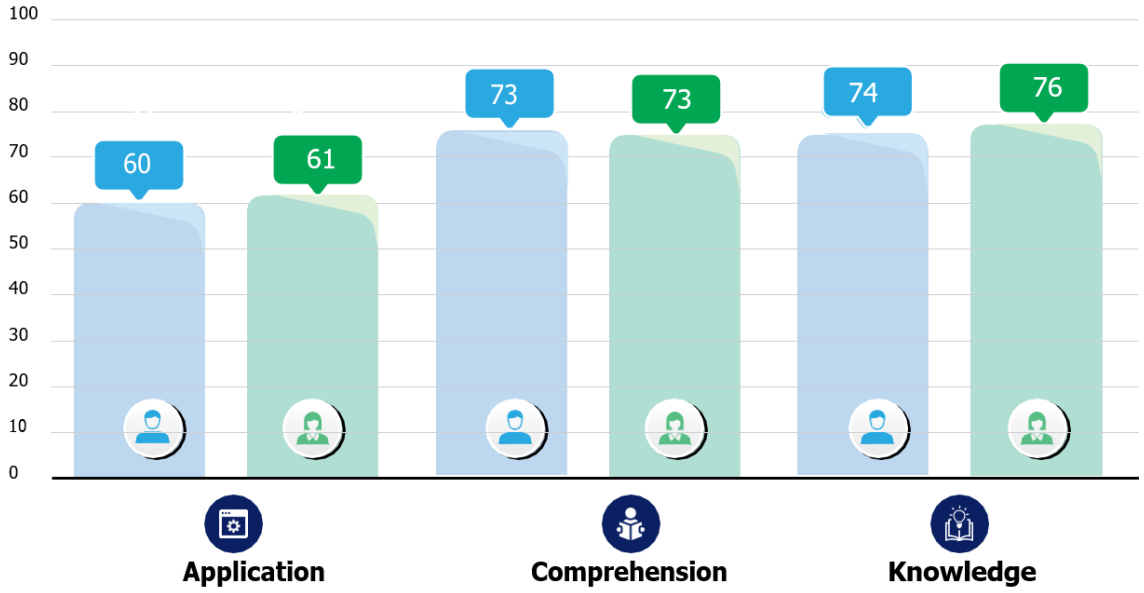
In Urdu and English, students scored highest (77% and 75%, respectively) in comprehension questions, whereas mathematics and science scored highest (75% and 68%) in knowledge level questions.

% Students Performance in Cognitive Domains of Language (English)



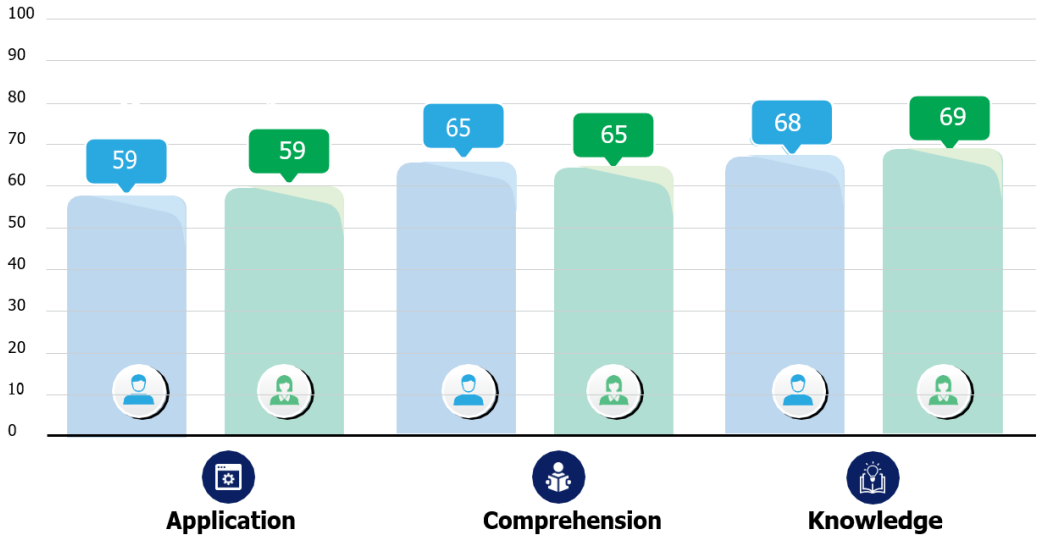
In English, the performance of female students is higher in all domains. Overall, the students achieved the highest scores on comprehension level questions.

% Students Performance in Cognitive Domains of Numeracy (Mathematics)



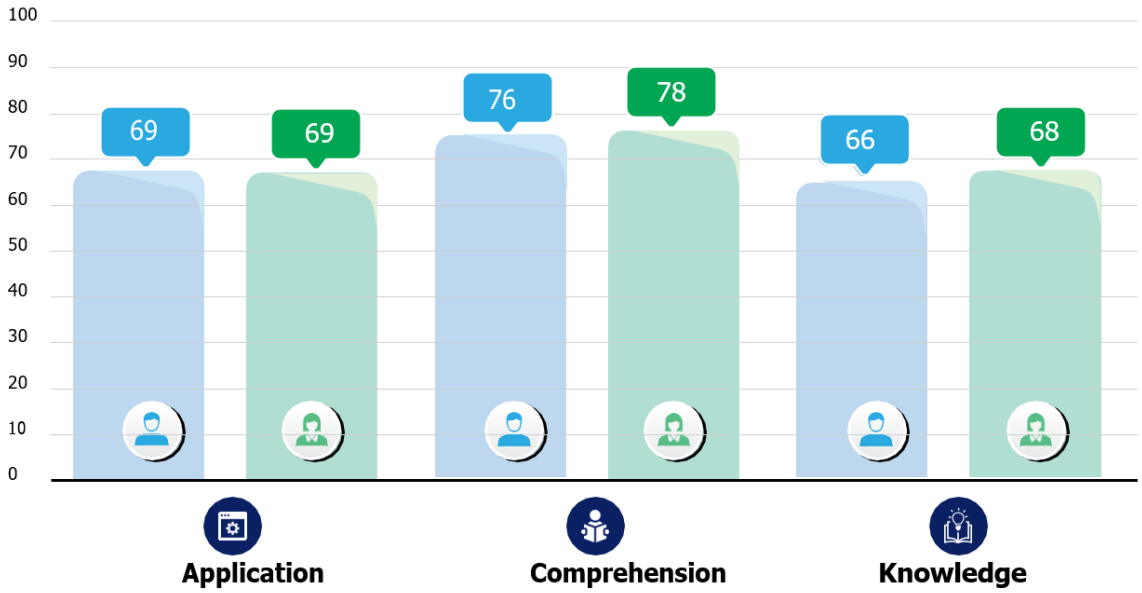
In Mathematics, the performance of females and males is relatively similar for application and comprehension level questions. However, male students performed better in knowledge level questions, i.e., 76%. Overall, students achieved the highest scores in questions testing knowledge.

% Students Performance in Cognitive Domains of Science



In science, the performance of females and males is similar for application and comprehension level questions. Overall, students achieved the highest scores in questions testing knowledge; female students scored one per cent higher than male students.

% Students Performance in Cognitive Domains of Language (Urdu)



In Urdu, the performance of females was higher in comprehension and knowledge domains. However, overall, students achieved the highest scores in questions testing comprehension.

3.1.3. Topic-wise Performance

Grade 8 students were assessed in mathematics, Science, Urdu and English as per the division of the content areas into different standards/ components/ strands given in the curriculum.

The topic-wise performance of the students in the 2022 assessment is given below:

Table 6: Overall student Performance Achieved according to Topics

Subject/ Topic	2022
Numeracy (Mathematics)	
Number & Operation	72%
Algebra	69%
Measurement & Geometry	58%
Trigonometry	47%
Information handling	60%
Language (English)	
Reading & thinking skills	68%
Listening	77%
Writing	56%
Lexical	76%
Oral communication/Listening	84%
Language (Urdu)	
Reading	83%
Writing/ creative writing	64%
Lexical	77%
Listening	73%
Life Skills	66%
Science	
Life sciences	67%
Physical Science	63%
Earth and space science	74%

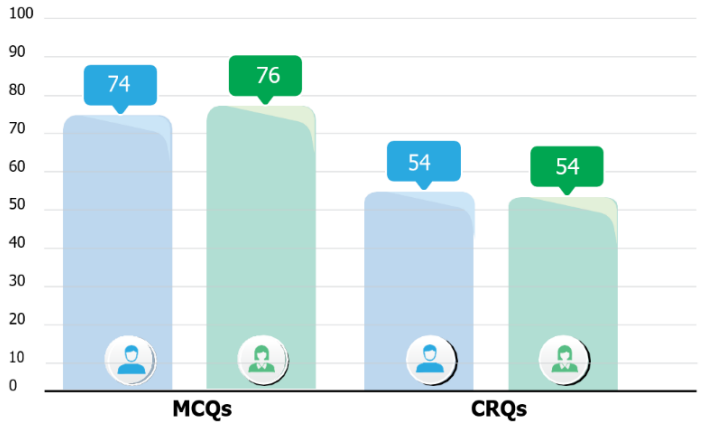
3.1.4. Item Type-wise Performance

The following figures show the percentage of correct responses by the students in multiple-choice questions (MCQs) and constructed response questions (CRQs)[1]:

The graphs show that overall, the scores of the students were higher in MCQs than CRQs.

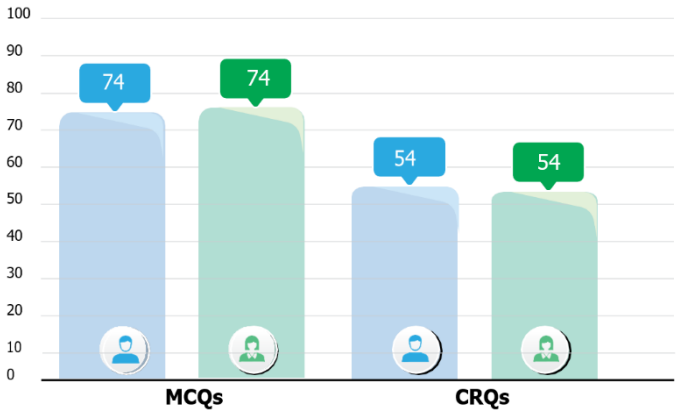
Figure 4: Overall Students' Performance According to Subject-wise Item Types

% Correct Responses by Students in English



In English, the percentage of correct responses of female students is higher in MCQs (76%) than male students. However, for CRQs, this percentage is the same for male as well as female students, i.e., 54% Overall, students` scores were higher for MCQs than CRQs.

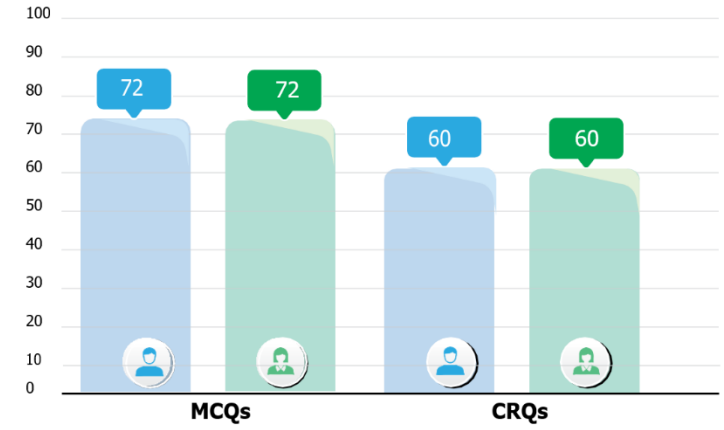
% Correct Responses by Students in Mathematics



In Mathematics, the percentage of correct responses of female and male students is the same for both MCQs and CRQs, i.e., 74% for MCQs and 54% for CRQs. However, overall, students` scores were higher for MCQs than CRQs.

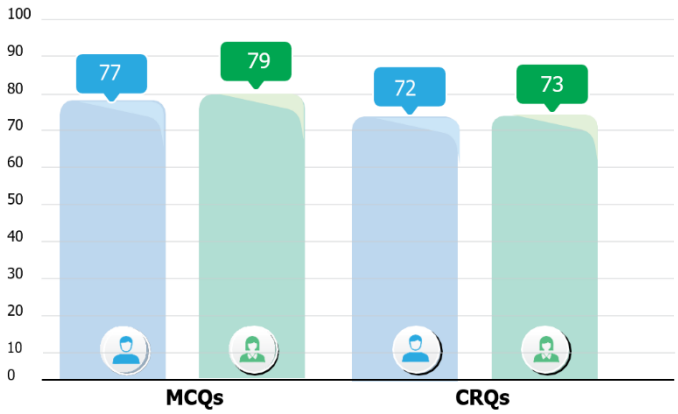
[1] MCQ stands for Multiple Choice Questions and CRQs stands for Constructed Response Questions.

% Correct Responses by Students in Science



In science, the percentage of correct responses for both MCQs and CRQs remain the same for female and male students, i.e., 72% for MCQs and 60% for CRQs. However, overall, students` scores were higher for MCQs than CRQs.

% Correct Responses by Students in Urdu



In Urdu, female students' correct responses are higher for both MCQs and CRQs by 2% and 1 %, respectively. Overall, students` scores were higher for MCQs than CRQs.

3.1.5. Performance in Reading Fluency

Reading fluency is gaining new recognition as an essential element of every reading programme, especially for students who struggle with reading. Keeping in mind the critical need to build reading skills in students and make them independent readers, the LSA 2022 assessed Grade 8 students` reading fluency skills.

Reading fluency assessment has been conducted in Urdu and English. It focuses on two components:

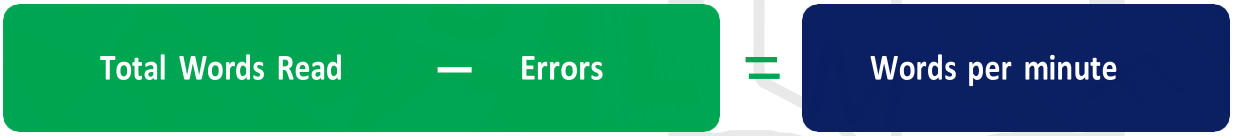
Rate measured as word per minute (WPM)

Accuracy: Word-reading accuracy refers to the ability to recognise or decode words correctly

To assess reading fluency, each student was given a paragraph to read, and the test administrator recorded the number of words read by the child in a minute. In addition, some words were highlighted in the paragraph to assess the accuracy (correct pronunciation).

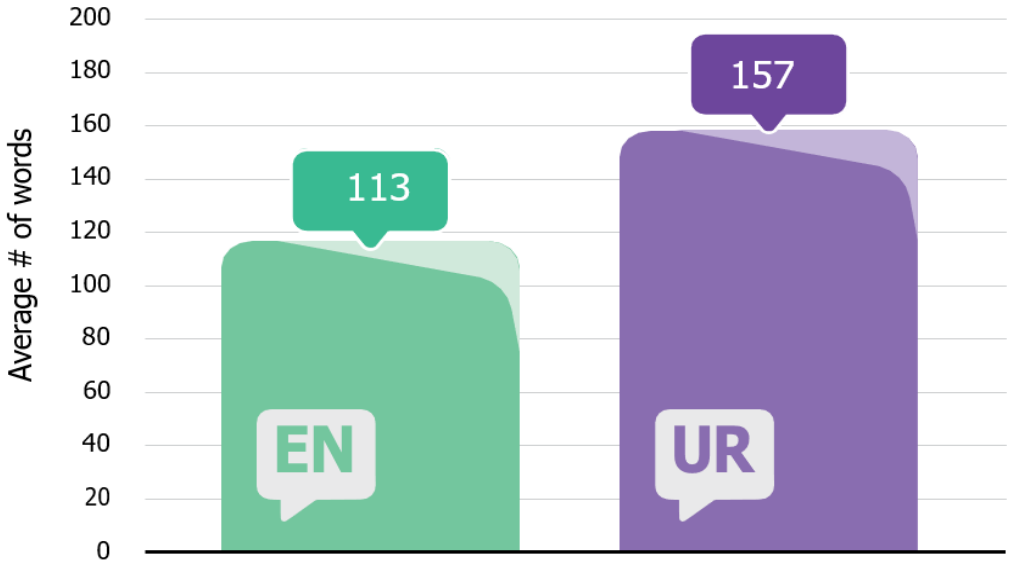
Reading fluency is calculated by taking the total number of words read in one minute and subtracting the number of errors:

One-Minute Reading



The following figure shows the average word count per minute for languages (i.e., English and Urdu).

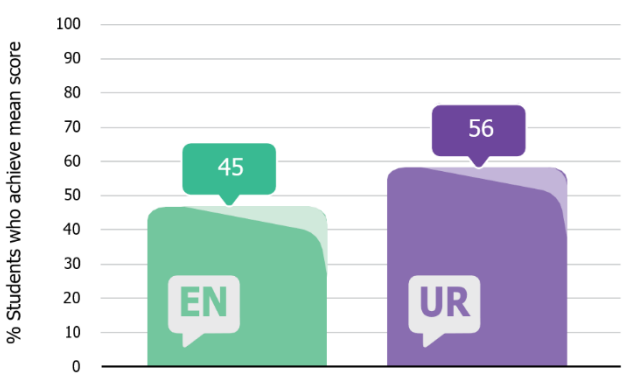
Figure 5: Average Student Scores Achievement in Reading Fluency

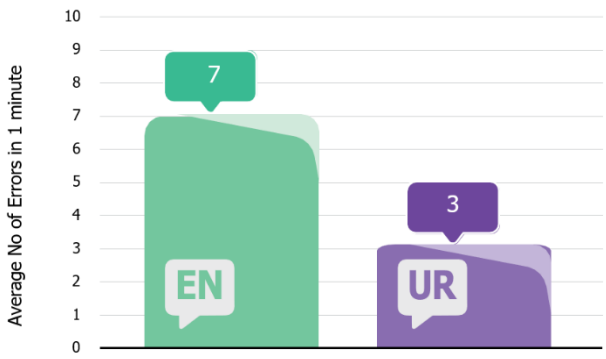


In Urdu, the average word count achieved by students is 157, while for English, the average word count is 113.

The graphs given below informed the percentage of students who achieved mean score or above per minute and the average number of errors made by the students while reading Urdu or English.

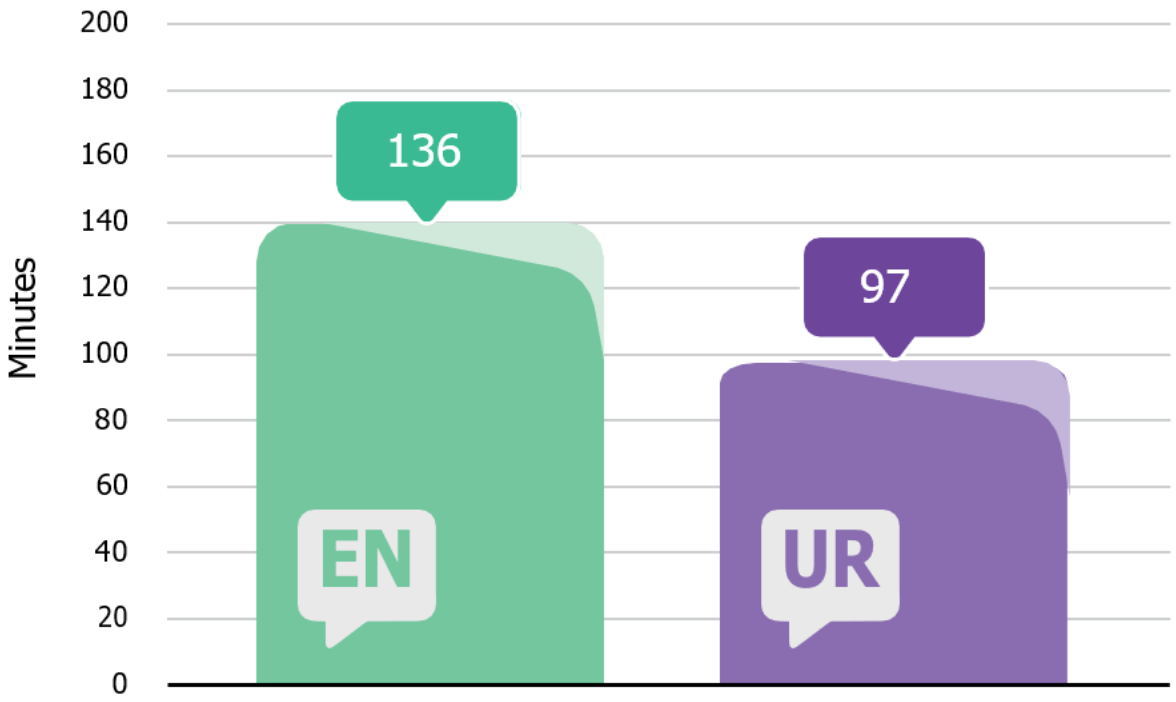
Figure 6: Performance of Students in Reading Fluency per Curriculum Benchmarks





The average time spent by the students to read complete paragraphs is given below, which shows that less time was spent reading Urdu (97 seconds) compared to English, which is 136 seconds.

Figure 7: Time spent to read the complete paragraph in seconds



The table below and the figure above provide an overview of reading fluency.

Table 7: Overview of Reading Fluency

Reading Fluency				
Words Per Minute	No of the words read in 60 Seconds		No Correct Word read in 1 minute	
	English	Urdu	English	Urdu
Less than 20	1.2%	1.1%	3.3%	1.5%
(21 - 40)	4.2%	1.7%	6.8%	2.2%
(41 - 60)	10.9%	4.4%	11.5%	4.4%
(61 - 80)	14.0%	4.6%	13.4%	4.8%
(81 - 100)	16.8%	7.4%	16.3%	8.0%
(101 - 120)	15.3%	9.9%	13.3%	9.5%
(121 - 140)	10.4%	8.1%	9.8%	8.1%
(141 - 160)	8.5%	9.1%	7.7%	9.0%
(161 - 180)	6.6%	10.9%	6.5%	10.8%
(181 - 200)	6.9%	15.5%	6.6%	15.6%
(201 - 220)	3.0%	25.8%	2.7%	24.6%
(221 - 240)	1.7%	.7%	1.6%	.6%
(241 - 260)	.2%	.3%	.1%	.3%
(More than 260)	.4%	.6%	.3%	.6%

The scattered plots given below show the words that the students correctly read.

Figure 8: Students Reading Correct Words per Subject - English

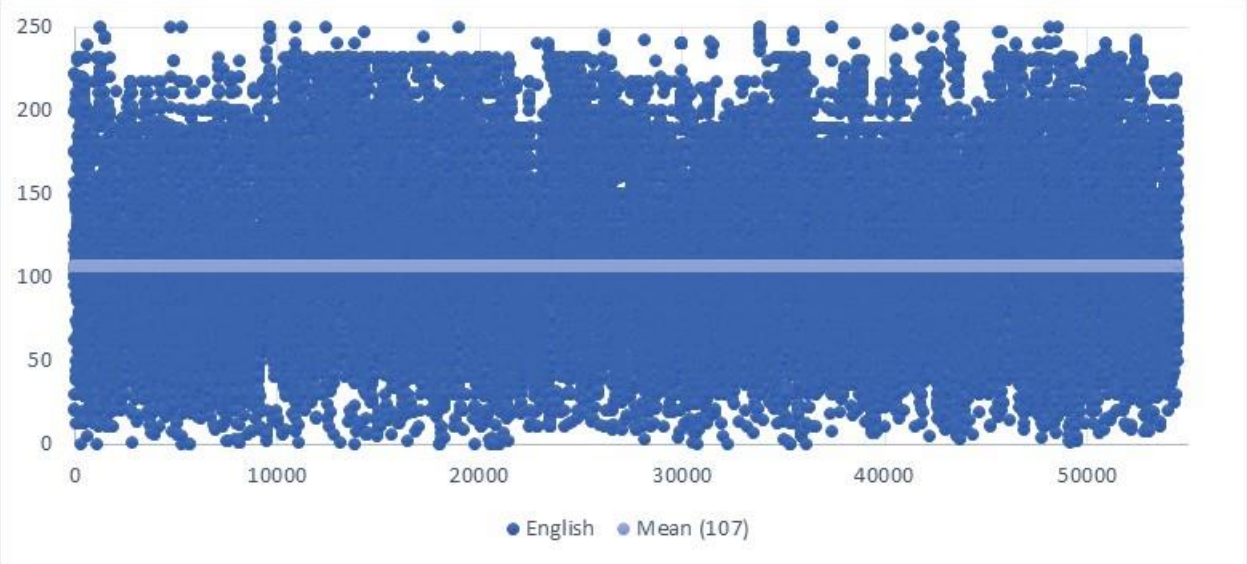
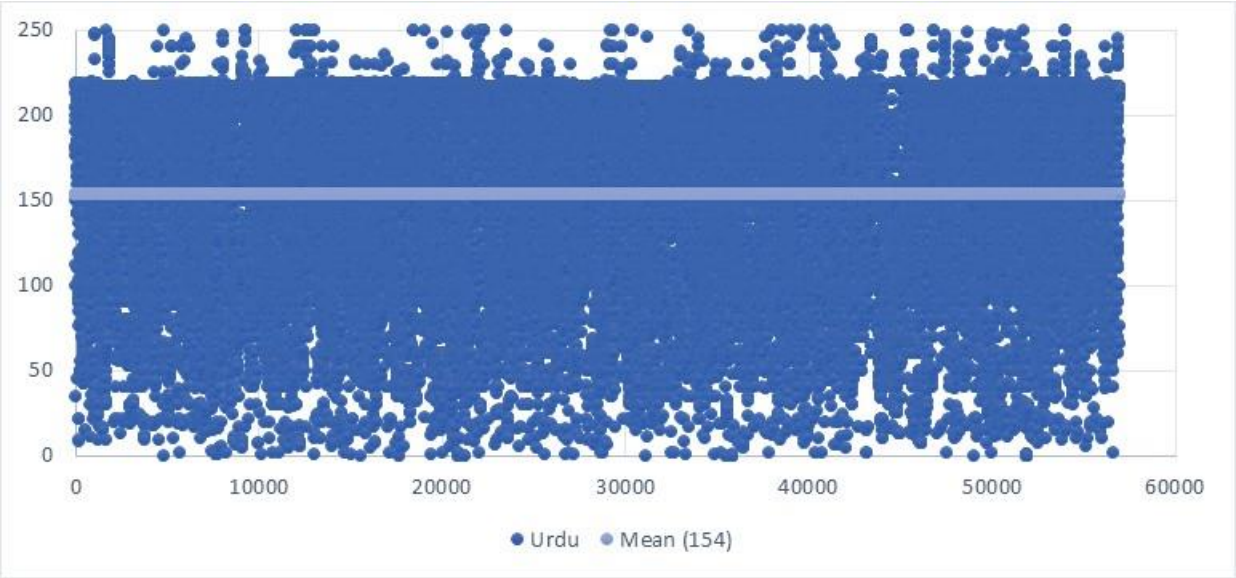


Figure 9: Students Reading Correct Words per Subject – Urdu



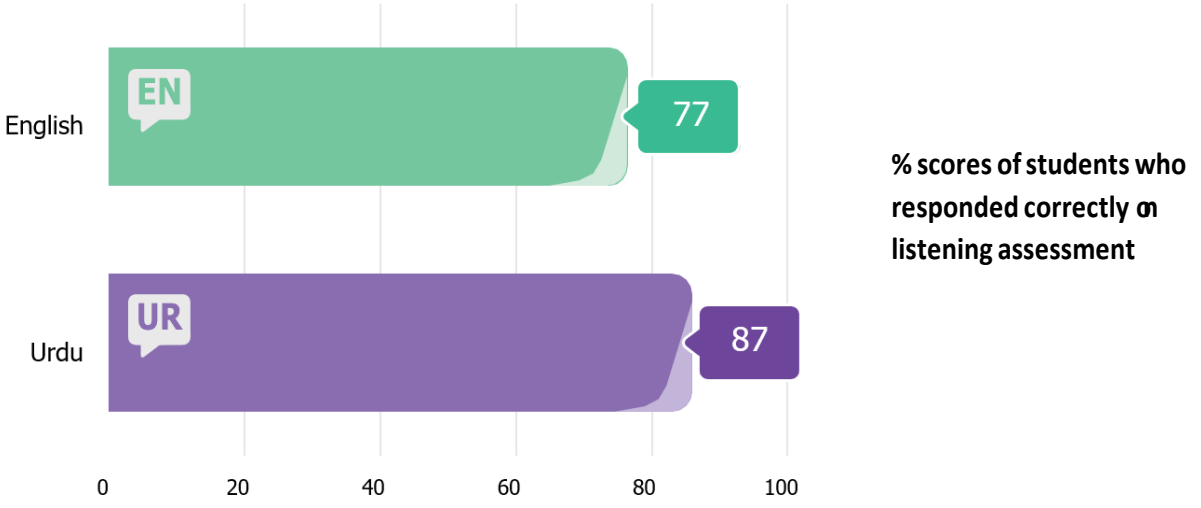
Both figures indicate a mixed performance by students. The mean scores indicate that students, on average, read 154 words correctly in Urdu compared to English, where only 107 words were read correctly. It is also important to note that many students could not read even one word correctly (secured zero marks). Number of such students is higher in English when contrasted with Urdu.

3.1.6. Performance in Listening Skills

The students' listening skills (comprehension) were assessed through the LSA. The unavailability of needed resources caused some limitations in the standardization process. However, in the assessment, the given passage was read out by the teacher in the presence of the test administrator, followed by the MCQ assessment. Students were required to listen, understand the text, and then complete the assessment accordingly.

The figure below shows the performance of students in both English and Urdu in terms of correct responses:

Figure 10: Performance of Students in Listening Assessment



3.1.7. Performance of Students in Speaking Assessment

PEC administered a speaking assessment for the first time. Two types of assessments were conducted:

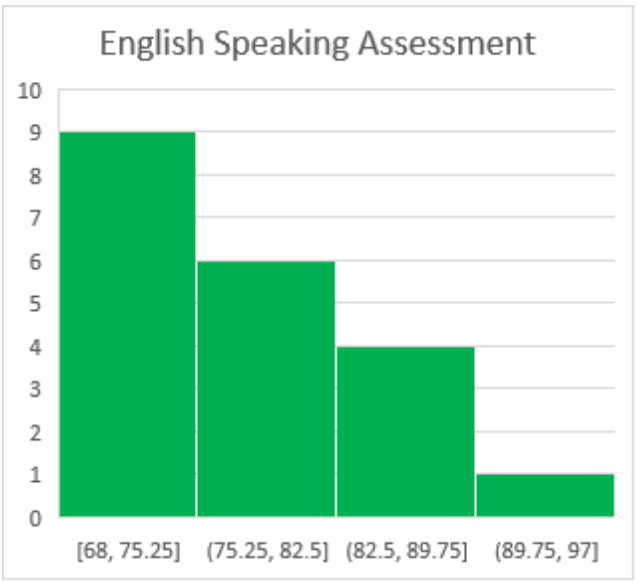
1. The students were provided with a topic and asked to speak about it.
2. The students selected a topic and talked about it.

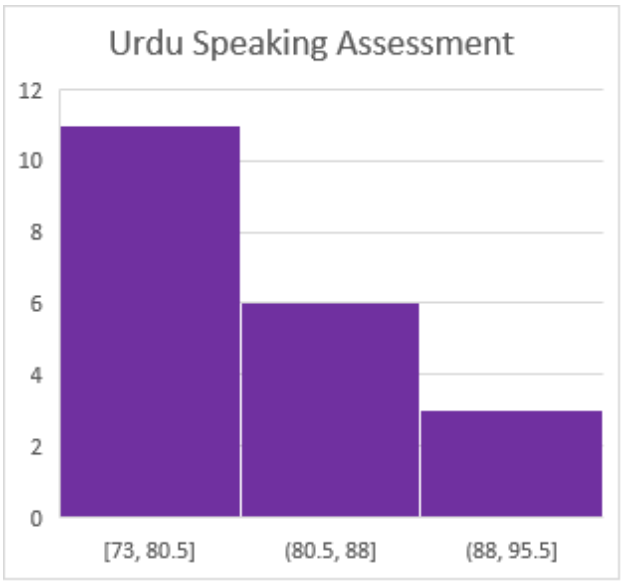
For both cases, the time in seconds was recorded. There were ten topics, and the average time recorded for each topic is given below:

Table 8: Average Time for continuous speaking on topic in seconds

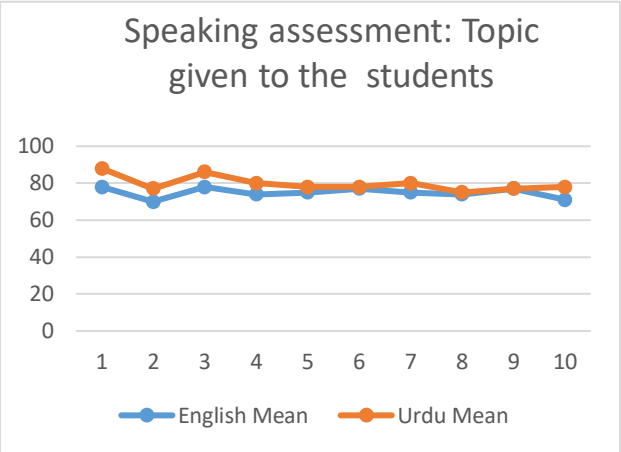
Topic Number	Given/Selected	English	Urdu
		Mean	Mean
1	Given	78	88
	Selected	69	73
2	Given	70	77
	Selected	73	76
3	Given	78	86
	Selected	81	82
4	Given	74	80
	Selected	82	86
5	Given	75	78
	Selected	83	88
6	Given	77	78
	Selected	85	89
7	Given	75	80
	Selected	83	85
8	Given	74	75
	Selected	97	91
9	Given	77	77
	Selected	89	90
10	Given	71	78
	Selected	68	74

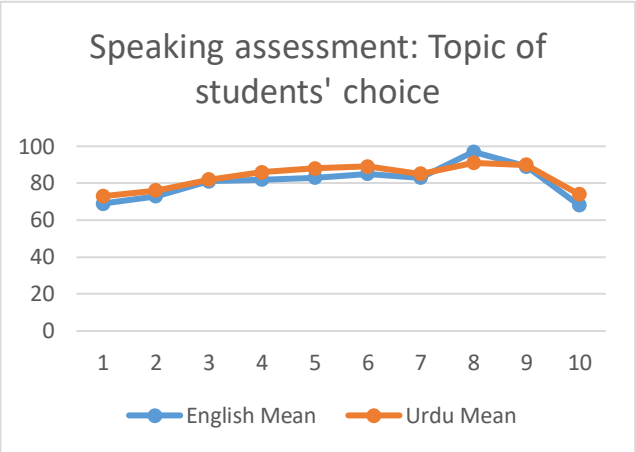
The following graphs show that most of the students could speak for 68 to 77 seconds in English and 73 to 80 seconds in Urdu.





The students scored higher when they selected the topic themselves as compared to the one that was given by the test administrator

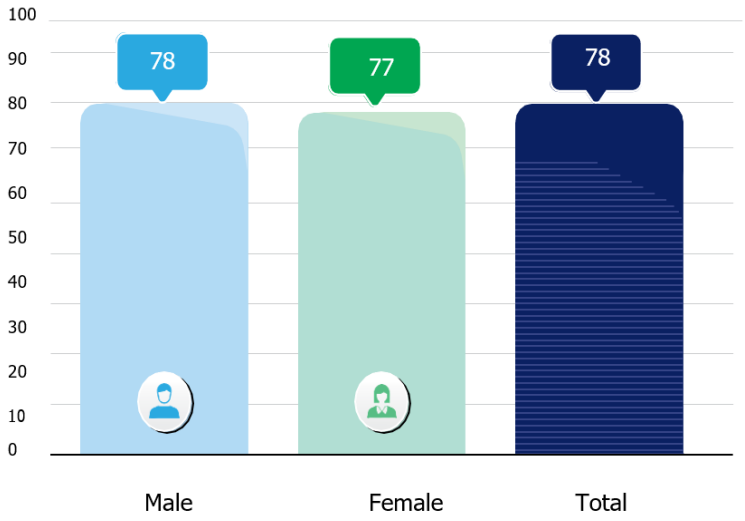




3.2. Overall, Teacher Performance

3.2.1. Gender-wise Performance

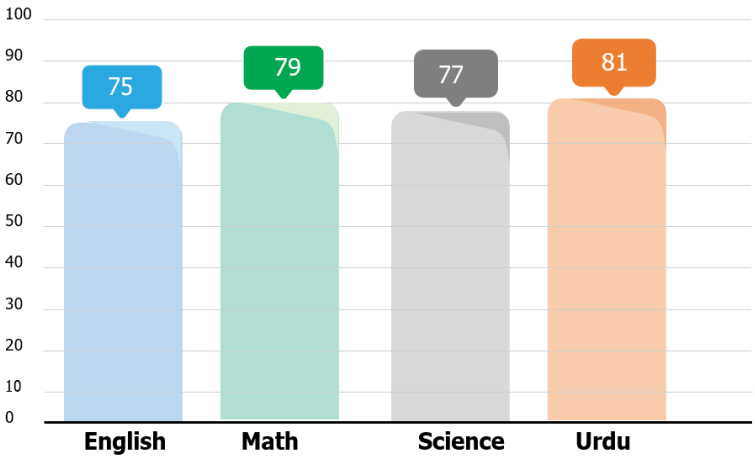
Figure 11: Overall Mean Scores Achieved by Teachers



The performance of male and female teachers is similar. However, male teachers scored 1% higher than female teachers.

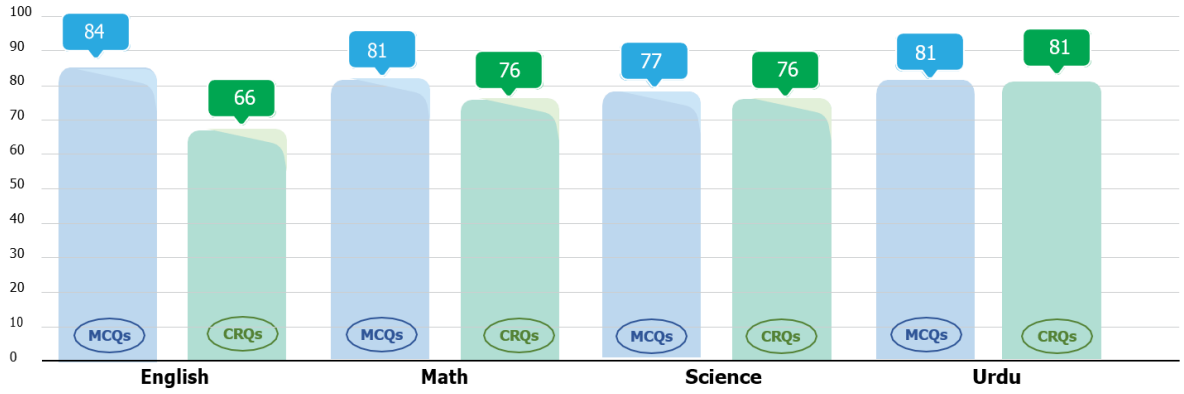
3.2.2. Subject-wise Performance

Figure 12: Subject-wise Mean Scores Achieved by Teachers



Results show that the overall mean score in each subject is more than 75%; however, the range is 75% to 81%. The mean score for Urdu is the highest, whereas the mean score for English is the lowest.

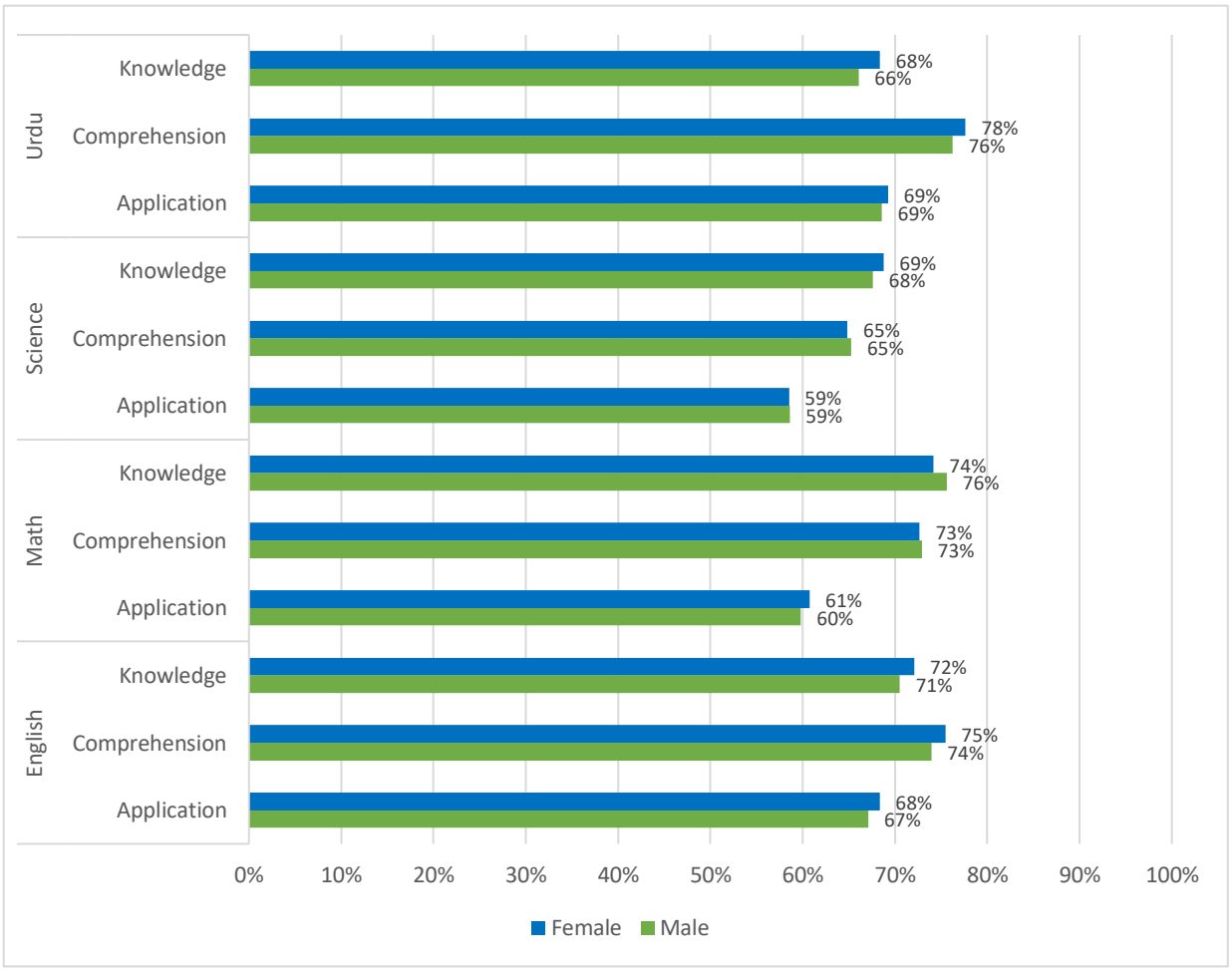
Figure 13: Overall teachers' Performance According to Subject-wise Item Types



The overall score of teachers is lowest in English CRQs, which is 66% but highest in MCQs.

Figure 14: Overall Teachers' Performance Based on Cognitive Domains

Mean % Score of Teachers by Cognitive Domains



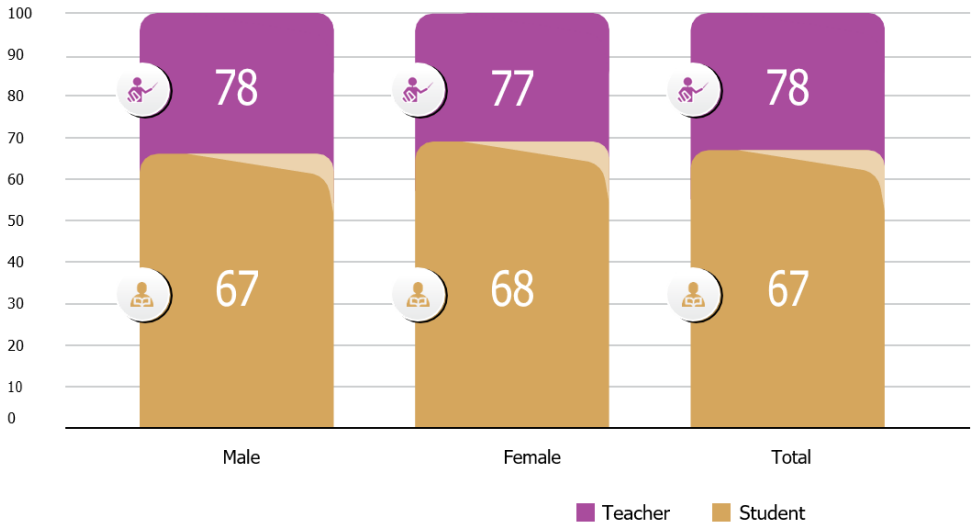
Overall, teachers scored the highest in knowledge-based and comprehension questions across all four subjects. In comparison, scores were lower in application-based questions. In addition, slight differences of 1-2% were recorded between scores of male and female teachers.

3.3. Comparative Scores: Performance of Teachers and Students

3.3.1. Overall, Gender-wise Performance

The figure below shows the comparative performance of both teachers and students in the assessment:

Figure 15: Overall Comparison of Mean Scores Achieved by Teachers and Students

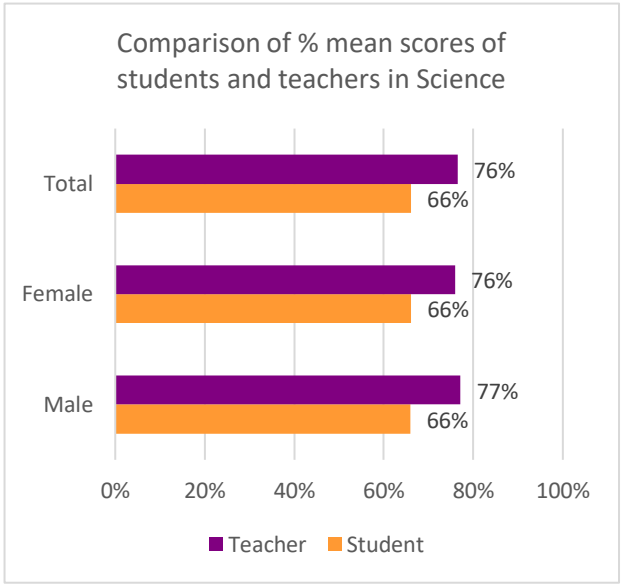


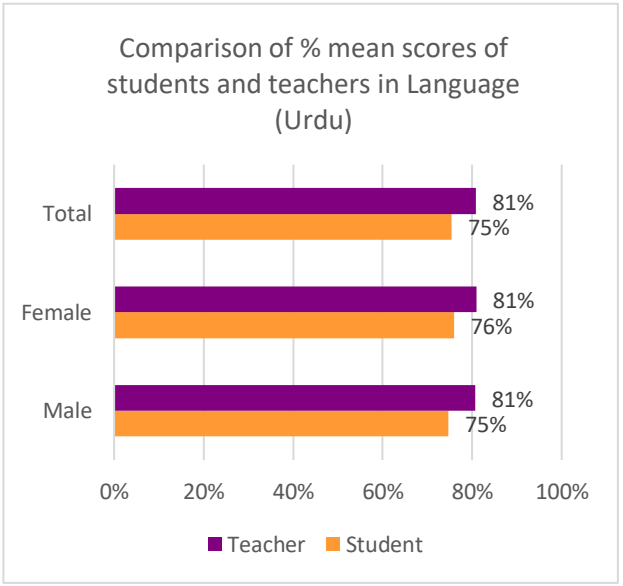
Results show that teachers' overall performance is higher than that of the students by 10%.

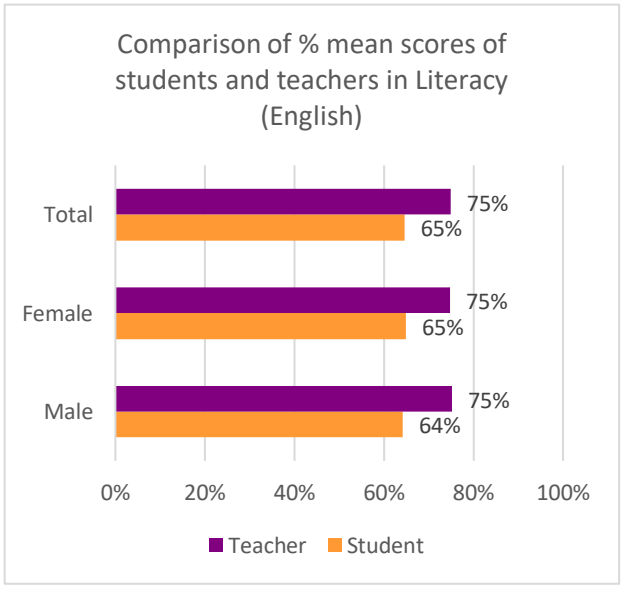
3.3.2. Subject-wise Teacher and Student Performance

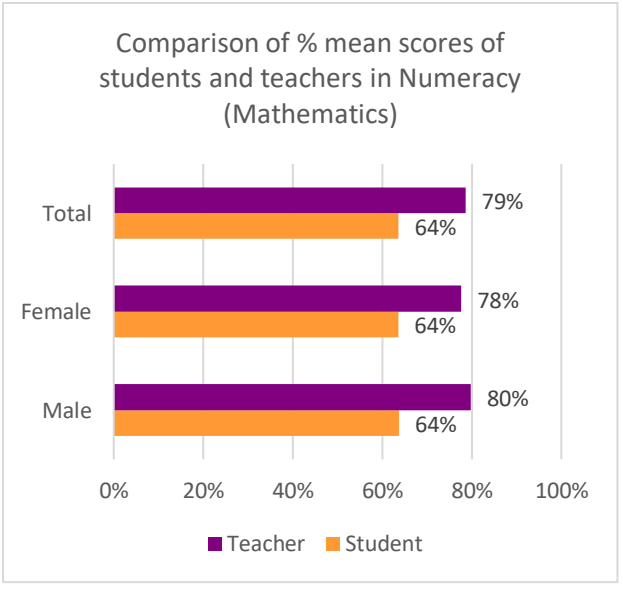
The figure below shows teachers' and students' subject-wise mean percentage scores under the English, Urdu, Mathematics and Science curriculum. Teachers' scores are higher than students' in all four subjects. For example, there is a difference of 15% in Mathematics, 10% in English and Science and 6% in Urdu.

Figure 16: Subject-Wise Comparison of Mean Scores Achieved by Teachers and Students









3.4. Comparative Scores: Performance of SED and PEF Administered Schools

3.4.1. Overall Students' Performance in SED and PEF Schools

The following figures show the overall mean score percentage of SED and PEF-administered schools:

Figure 17: Overall Students' Performance in SED and PEF Administered Schools

Overall Mean % Scores of Students in SED and PEF Schools

Results show a difference of 2% between SED and PEF.

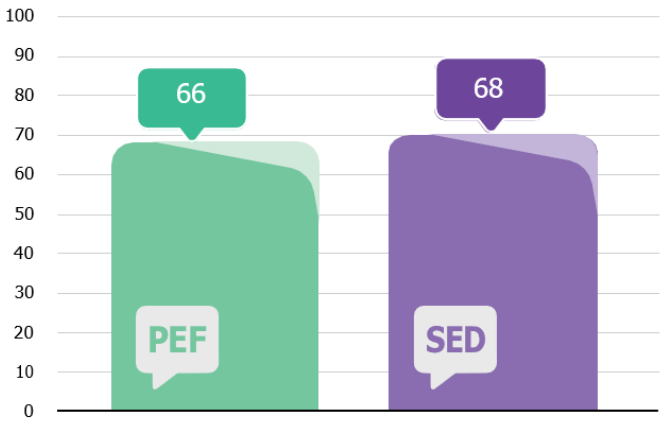
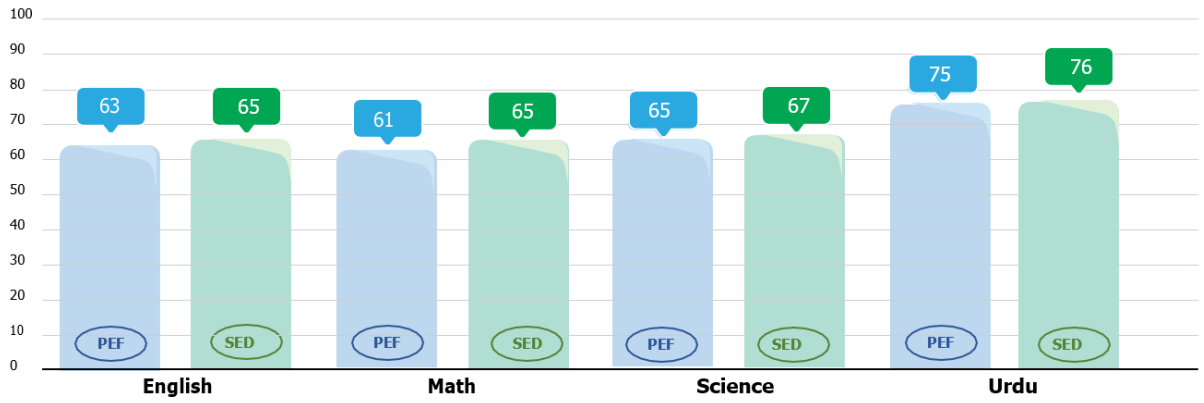


Figure 18: Subject-wise Students' Performance in SED and PEF Administered Schools



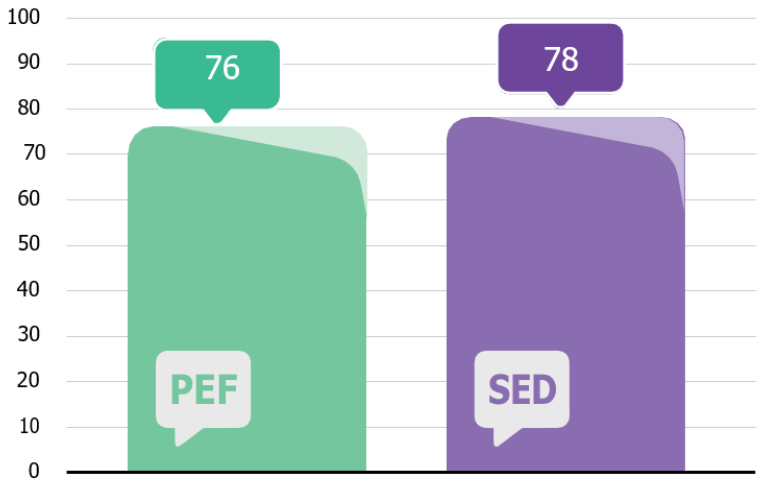
The figure above gives the students learning performance in all four subjects—Mathematics, Science, English and Urdu. The average difference between SED and PEF schools is 2%. Overall, PEF schools showed the lowest scores in all subjects, especially in Mathematics.

3.4.2. Overall, Teacher Performance in SED and PEF Schools

Results show that teachers at SED schools understand subject knowledge better than teachers of PEF schools.

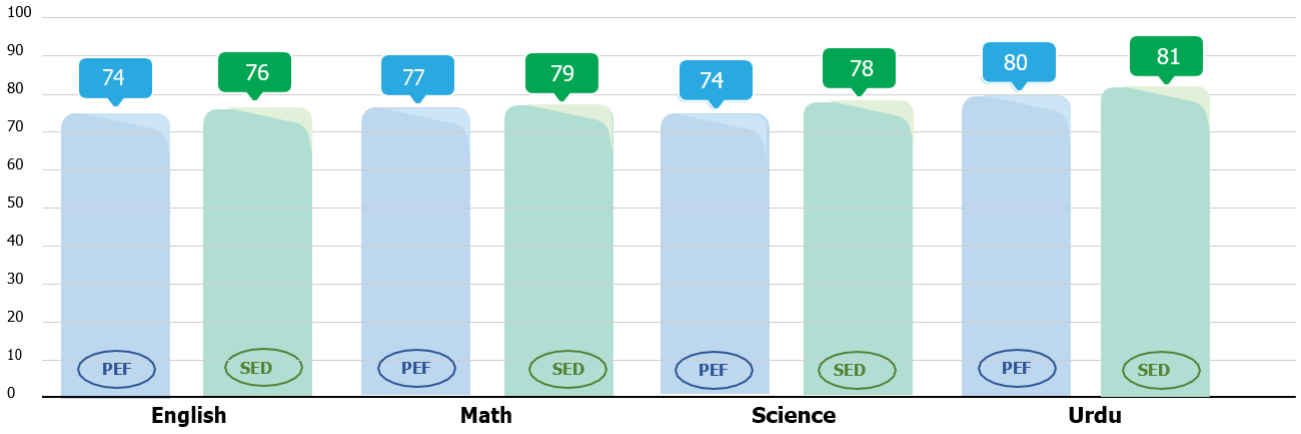
Figure 19: Overall Teachers' Performance in SED and PEF Schools

Overall Mean % Scores of Teachers in SED and PEF Schools



Subject-wise performance findings show that teachers from SED schools have a higher mean score in all four subjects—Mathematics, Science, English and Urdu- than teachers at PEF schools. The score of PEF is the lowest in the subjects of Science and English, respectively

Figure 20: Subject-wise Teachers' Performance in SED and PEF Schools



Relationship between Student Scores and Individual Attributes

Students' scores have been regressed using multiple regression models on several variables of interest to see the relationship between their performance and factors such as schools, teachers, head teachers and parents' background.

Findings from these multiple regressions are outlined below:

3.4.3. Teachers and Teaching Practices

Research highlights that students' performance is affected by the quality of teaching. To understand this relationship, student scores are regressed in teachers' key areas of interest.

The summary of the results is given below:

Factor	Coefficient	Impact type	P-Value
Significant factors			
Academic qualifications	0.50	Positive	.000***
Professional qualifications	0.25	Positive	.000***
Teaching experience	0.110	Positive	.000***
Gender impact	0.12	Positive	.095*
Classroom teaching practices	0.063	Positive	.000***
Teacher behaviour	0.269	Positive	.000***
Participation in continuing professional development program	0.155	Positive	.029**
Insignificant factors			
Classroom practices – multi grade teaching	-0.039	Negative	.790
Teacher plan their lesson	.015	Positive	0.915

*** Significant at 1%, ** Significant at 5%, * Significant at 10%

Findings from these regressors are outlined in the sub-sections below.

ACADEMIC QUALIFICATION

It was found that an increase in teacher qualification by one level raised students' scores by 0.50 points. Therefore, teachers' academic qualification significantly (at 1%) positively affects students' academic performance.

Result:

The students taught by teachers having higher academic qualifications showed better learning achievement than students who were taught by other teachers.

PROFESSIONAL QUALIFICATION

It was found that an increase in teachers' professional qualification by one level raised students' scores by 0.25 points. This indicates a significant (at 1%) positive relationship between teachers' professional qualifications and students' academic performance.

Result:

The students taught by teachers having a higher professional qualifications showed better learning achievement than students taught by other teachers.

TEACHING EXPERIENCE

For every additional year of teaching experience, students' scores increased by 0.110 points. This indicates a significant (at 1%) positive relationship between teachers' teaching experience and students' academic performance.

Result

The students taught by teachers having more teaching experience showed better learning achievement than the students taught by less experienced teachers.

GENDER VARIABLE IMPACT

Test results of male teachers in the sample were compared with those of female teachers, keeping all other variables constant. Students who were taught by female teachers performed slightly better than those taught by male teachers and scored 0.12 points higher. Results show that gender's effect on students' academic performance is significant at 10%.

Result

The academic performance of students taught by female teachers was slightly better than male

CLASSROOM TEACHING PRACTICES

The students who were taught by using any of the following nine practices scored 0.063 more than those students who were not taught by using these practices. The nine classroom practices given below had a positive and significant effect on students' learning achievements:

- Use of Whiteboards
- The Activity-based Teaching-Learning Process
- Outdoor Activities
- Teacher Asking Questions
- Students Asking Questions
- Teacher Responds to Student's Question
- Homework Checking
- Identifying Mistakes and Feedback for Improvement
- Teacher as a Problem Solver

Result:

Above mentioned classroom practices—formative assessment, Audio-visual (AV) aids, teaching strategies, and teachers' supportive attitude has a positive and significant (at 1%) effect on students' learning achievements.

TEACHERS BEHAVIOUR

Students in schools where teachers are friendly and encouraging scored 0.269 points higher than in schools where teachers' behaviour is not friendly. Teachers' friendly behaviour significantly (at 1%) positively affects students' learning achievements.

Result:

Students attained higher scores whose teachers adopted friendly behaviour while teaching.

3.4.4. School Facilities and Related Factors

Students' performance is significantly affected by the quality of the school environment. To understand this relationship, students' scores are regressed in the following key areas of interest.

The summary of the results is given below:

Factor	Coefficient	Impact type	P-Value
Significant factors			
Opportunities to participate in co-curricular activities	0.552	Positive	.009***
Social involvement of students/interactions between students	0.130	Positive	.000***
Student absenteeism	0.82	Positive	.000***
Classroom Resources (Furniture, Whiteboard, Language kit, Library)	0.92	Negative	0.075***
Insignificant factors			
Provision of basic facilities (electricity, water, and washrooms)	-0.193	Negative	0.346
Community/ Parent meetings	-0.045	Negative	0.771

*** Significant at 1%, ** Significant at 5%, * Significant at 10%

Findings from these regressors are outlined in the sub-sections below.

PROVISION OF BASIC FACILITIES

The results showed that the schools equipped with basic available and functioning facilities (electricity, water, and washrooms) did not lead to a higher score than schools without these facilities

Result:

The provision of basic facilities (electricity, water, and washrooms) in the schools has an insignificant effect on students learning achievement. However, this cannot be taken at face value. These amenities are considered fundamental rights of the students, and their impact is already established worldwide. The relevant authorities must keep working on improving these facilities

OPPORTUNITIES TO PARTICIPATE IN SPORTS

Students in schools where they are given opportunities to participate in different types of co-curricular activities scored 0.552 points higher than in schools where these activities are not organized. The provision of co-curricular activities has a positive and significant (at 1%) effect on students' learning achievements.

Result:

Students' participation in co-curricular activities significantly positively affects their educational achievements.

The findings reveal that only the following co-curricular activities are conducted and played by the students:

SOCIAL INVOLVEMENT OF STUDENTS/INTERACTIONS BETWEEN STUDENTS

The students of such schools where students play and help each other and have a friendly relationship, scoring 0.130 points higher than schools where students have less social bonding. The results are significant at 1%.

Result:

Students' social involvement with each other also positively contributes to their educational achievements.

STUDENT ABSENTEEISM

Regular students scored 0.82 points higher than students in schools where absenteeism is higher. The most common reason for remaining absent from school is sickness and taking care of siblings. The results are significant at 1%.

Result:

Student who attended their classes regularly scored higher than who frequently remained absent from schools.

3.4.5. School Leadership

The leadership provided in the school, specifically the head teacher, the school council, and other officials, are essential contributors to students' performance. To understand this relationship, students' scores are regressed in critical areas of interest.

The summary of the results is given below:

Factor	Coefficient	Impact type	P-Value
Significant factors			
Use of curriculum and teacher guides	0.398	Positive	.047**
Engagement of school councils in learning decisions	0.066	Positive	0.015**
Insignificant factors			
Local languages used in teaching	0.151	Positive	0.814
The utilisation of NSB funds	0.188	Positive	0.182

*** Significant at 1%, ** Significant at 5%, * Significant at 10%

Findings from these regressors are outlined in the sub-sections below.

LOCAL LANGUAGES USED IN TEACHING

The students of the teachers who used local languages in teaching scored 0.151 points higher than the schools where teachers do not teach in local languages. However, this effect is insignificant.

Result:

The lesson delivery in local languages has positive but insignificant effects on students learning achievements.

USE OF CURRICULUM AND TEACHER GUIDES

Students at schools where the teachers' curriculum and teacher guides are available and used by the teachers scored 0.398 points higher than those where these documents are unavailable or not used.

Result:

Using teachers' guides and understanding of the curriculum has a significant (at 5%) positive effect on students learning achievements.

UTILISATION OF NSB FUNDS

Students at those schools where School Council funds/grants/NSB fulfil 75% needs of schools scored 0.188 points higher than those where School Council funds/grants/NSB meet less than 75% needs of schools.

Result:

Provision of School Council funds/grants/NSB has an insignificant positive impact on students learning achievements

ENGAGEMENT OF SCHOOL COUNCILS IN STUDENT LEARNING

The school council regularly discusses students' performance, teacher training, resources, and co-curriculum activities, scoring 0.066 points higher than schools where no discussions are undertaken.

Result:

The regular discussion of school councils on students' performance, teacher training, resources, and co-curriculum activities has a positive significant effect on students' learning achievement.

The regular discussion of school councils on matters mentioned above has a positive and significant (at 5%) affect in determining students' learning achievement.

3.4.6. Parents Engagement

Students' socioeconomic conditions, especially background and economic factors, impact student performance. To understand the relationship between these factors, the student's scores are regressed in key areas of interest:

The summary of the results is given below:

Factor	Coefficient	Impact type	P-Value
Significant factors			
Fathers` qualification	0.060	Positive	0.000***
Mothers` qualification	0.022	Positive	.069***
Source of income	0.039	Positive	.003***
Resources available at home	0.030	Positive	0.000***
Study at home	0.115	Positive	.000***

*** Significant at 1%, ** Significant at 5%, * Significant at 10%

Findings from these regressions are outlined in the sub-sections below.

PARENTS' QUALIFICATION

It was found that an increase in the father's qualification by one level raised students' performance scores by 0.060 points, and an increase in the mother's qualification by one level raised students' performance scores by 0.022 points.

Result:

Parents' education has a significant (at 1%) effect on students' learning performance.

SOURCE OF INCOME

The role of fathers' income is favorable and significant (at 1%) determinant of students' assessment scores. The data revealed that the most common profession of students' parents (29%) is farming. It was also found that the students whose parents have an income ranging from Rs. 5000 to Rs. 40000 performed almost equally.

RESOURCES AVAILABLE AT HOME

It was found that the availability of essential resources[2] at home raised students' scores by 0.030 points. The effect of the availability of essential resources at home on students' learning achievement is significant (at 1%) and positive.

Result:

The availability of essential resources at home improves students' performance.

STUDY AT HOME

The data revealed that an increase in the time given by the students at home on studies by one hour raised students' scores by 0.115 points. The effect of studying at home has a significant (at 1%) impact on students' learning achievements.

Result:

The additional time given by the students to their studies for revisions of lessons at their homes improve their performance.

[2] These resources refer to the availability of reading materials (religious books, general knowledge books, children's storybooks, and dictionaries), electronic devices (TV, mobile phones, and computer), own room and bicycle/motorcycle etc.

Teachers, School Council and Parents' Feedback

3.4.7. Teachers' Feedback

Teachers were asked a series of questions to understand their perceptions of key areas of the school system that affect student performance.

The variables analysed include:

- Textbooks
- Lesson planning
- Teaching practices used in the classroom
- Parents participation
- Involvement in school administration
- Teaching subjects of Science, Mathematics, English and Urdu

TEXTBOOKS

Teachers were asked to provide feedback on current textbooks used in Grade 8 classrooms. The responses are given in the table below.

Table 9: Feedback on Currently Taught Textbooks

The content in the books is given	Not at all	Little bit	Most of it	Completely
according to the students' age and class	2%	10%	56%	32%
in simple language	3%	12%	52%	33%
with interesting activities	5%	26%	44%	25%
with appropriate exercises	2%	7%	45%	46%
in an inappropriate font size	3%	9%	37%	51%
with local examples	7%	26%	38%	29%

50% of teachers agree that the textbooks are according to the age and class level. However, less than 50% are satisfied with the language and content.

LESSON PLANNING

Teachers were asked about the development and use of lesson plans in their teaching. Results show that 87% of teachers plan their lessons daily before they teach.

- 97% of the reported teachers plan their lessons according to SLO.
- 98% of the reported teachers use students' records while planning lessons.

According to teachers, they take support in lesson planning by:

Table 10: Teachers taking Support for Lesson Planning

Teachers take support from the following during their lesson planning	Percentage of responses
Head teachers	22%
Peer teachers	31%
Teacher guide	46%

The table below shows the following methods teachers use to assess students' learning.

TEACHING PRACTICES USED IN THE CLASSROOM

Table 11: Methods used by Teachers to Assess Classroom Learning

	Always/mostly
Oral through question/answers	99%
Written	98%
Homework	98%
Involvement in classroom activities	98%

PARENTS PARTICIPATION

To understand engagement with parents, teachers were asked questions about parents involvement in school matters.

Responses show that 84% of the teachers discuss students' progress with their parents monthly. Other discussion areas are given in the table below.

Table 12: Areas of discussion with Parents by Teachers

	Always/mostly
Student's absenteeism	74%
Co-curricular activities	64%
Students' performance in his/her studies	80%
School discipline	66%

INVOLVEMENT IN SCHOOL ADMINISTRATION

Teachers were asked questions about their interaction with the head teachers and their involvement in administration activities. Responses are given in the table below.

Table 13: Areas of Engagement in School Administration by Teachers

	Always/mostly
School administration	82%
Discussion with fellow teachers to improve students learning	97%
Meeting with parents to discuss students' issues	91%
Participation in solving students' problems	97%

Further feedback from teachers about their head teacher's performance is as follows:

Table 14: Feedback about head teacher`s performance

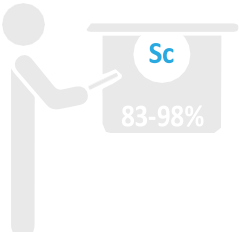
Feedback about head teacher's performance	Percentage of responses by teachers
The Head teacher always follows the rules and regulations of the school.	98%
The Head teacher always makes an effort to bring improvement to the school.	98%
The Head teacher always guides teachers on classroom instructions.	95%
The Head teacher always invites guest speakers to discuss different topics/concepts.	70%
The Head teacher always remains in contact with parents to discuss school affairs.	89%

TEACHING SUBJECTS OF SCIENCE, MATHEMATICS, ENGLISH AND URDU

Teachers were asked about their knowledge and experiences in teaching the four subjects evaluated under the assessment, i.e., English, Mathematics, Urdu, and Science. Responses are given below:

Teaching of Science

Majority of the teachers (about 88% to 99%) use the following technique for teaching Science:



1. Asking questions from the taught lessons
2. Asking students to experiment on their own
3. Support students to understand different scientific processes
4. Encourage students to observe
5. Advise the student to work in group
6. Encourage students to ask questions

Majority of the teachers (about 76% to 94%) give the following as homework for Science:

1. Solve exercises
2. Perform practical
3. Make charts or models
4. Collect information/material about the topic
5. Read books other than textbooks

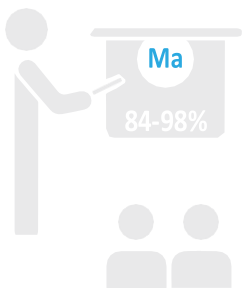
36% of the teachers have received training on teaching Science in the last 2 years. More than 85% of teachers find the topics in the Science textbook easy. Breakdown of responses is given below.

Table 15: Topic-wise Difficulty levels in science

Topics	% of teachers found easy	% of teachers found difficult
Human Organ Systems	95%	5%
Cell Division	90%	10%
Biotechnology	91%	9%
Pollutants and their Effects on the Environment	95%	5%
Chemical Reactions	78%	22%
Acids, Alkalis, Bases & Salts	82%	18%
Force and Pressure	92%	8%
Measurements of Physical Quantities	88%	12%
Sources and Effects of Heat Energy	95%	5%
Lenses	77%	23%
Electricity in Action	85%	15%
Exploring Space	84%	16%

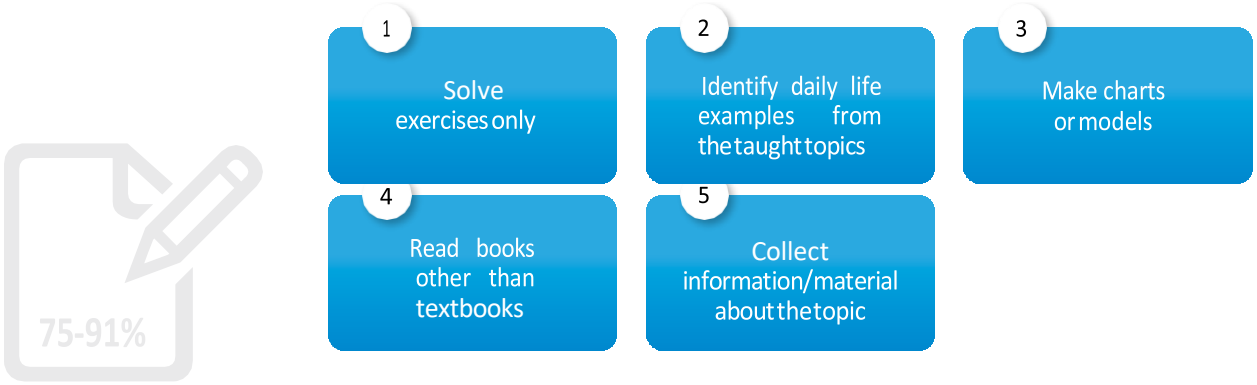
Teaching of Numeracy (Mathematics)

Majority of the teachers (about 84% to 98%) use the following technique for teaching Mathematics:



1. Use of mathematics in daily life
2. Provide opportunity of question answers and mental
3. Asking questions other than textbooks
4. Encourage students to ask questions
5. Advise the student to work
6. Encourage students to observe

Majority of the teachers (about 73% to 97%) give the following as homework for Mathematics:



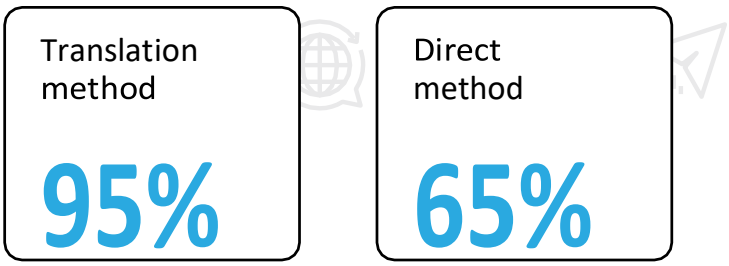
43% of teachers have received training on teaching Mathematics in the last 2 years. More than 86% of teachers find the topics in the Mathematics textbook easy. Breakdown of responses is given below.

Table 16: Topic-wise Difficulty levels in Mathematics

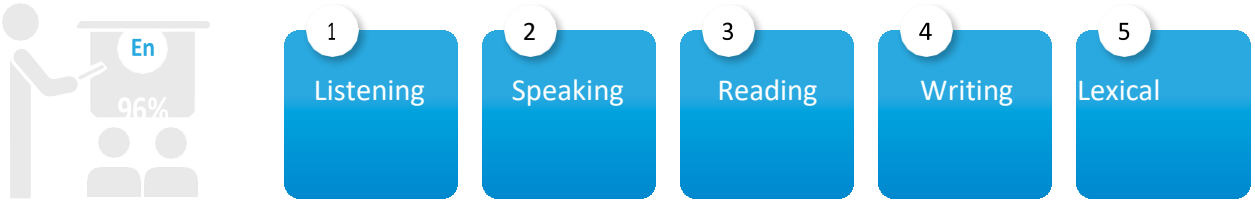
Topics	% of teachers found easy	% of teachers found difficult
Operations on Sets	95	5
Real Numbers	95	5
Number Systems	95	5
Financial Arithmetic	72	28
Polynomials	93	7
Factorization Simultaneous Equations	89	11
Fundamentals of Geometry	85	15
Practical Geometry	81	19
Areas and Volumes	89	11
Demonstrative Geometry	70	30
Introduction to Trigonometry	83	17
Information handling	92	8

Teaching of Literacy (English)

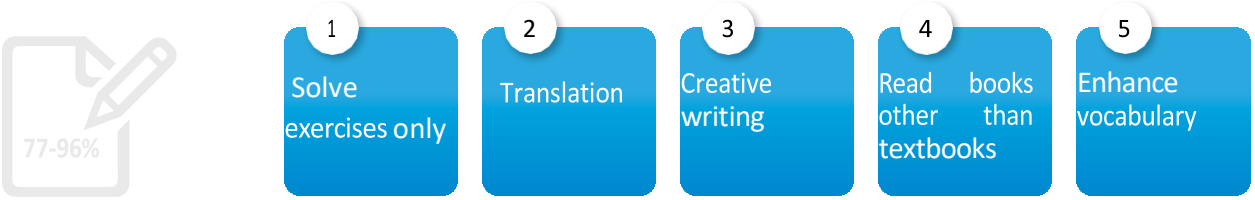
Majority of the teachers (about 65% to 95%) use the following technique for teaching English:



96% of the teachers focus on teaching the following competencies:



Majority of the teachers (about 77% to 96%) give the following as homework for English:



27% of teachers have received training on teaching English in the last 2 years.

More than 80% of teachers find the topics in the English textbook easy. Breakdown of responses is given below.

Table 17: Topic-wise Difficulty levels in English

Topics	% of teachers found easy	% of teachers found difficult
Comprehension	92%	8%
Poems	81%	19%
Prose	73%	27%
Grammar and Structure	88%	12%
Essay Writing	91%	9%
Creative Writing	77%	23%
Letter or application	96%	4%
Precise/Summarizing	69%	31%
Dialogue writing	89%	11%
Oral Communication	87%	13%
Phonetics	65%	35%

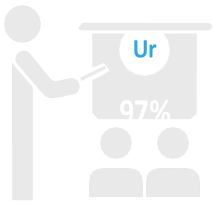
Teaching of Literacy (Urdu)

Majority of the teachers (about 71% to 93%) use the following technique for teaching Urdu: (Options)

Translation method

Direct method

97% of the teachers focus on teaching the following competencies:



1. Listening
2. Speaking
3. Reading
4. Writing
5. Lexical/ Grammar

Majority of the teachers (about 82% to 96%) give the following as homework for Urdu:

1. Solve exercises only
2. Translation
3. Creative writing
4. Read books other than textbooks
5. Enhance vocabulary

28% of the teachers have received training in teaching Urdu in the last two years.

88% of teachers found that the provided training can always/mainly be applied in the classroom.

More than 90% of teachers find the topics in the Urdu textbook easy. A breakdown of responses is given below.

Table 18: Topic-wise Difficulty levels in Urdu

Topics	% of teachers found easy	% of teachers found difficult
پڑھائی – نثر پڑھانا	96%	4%
پڑھائی – نظم پڑھانا	93%	7%
تفہیم	87%	13%
تشریح	92%	8%
قوائد	85%	15%
جملہ سازی	94%	6%
مضمون نویسی	94%	6%
تخلیقی لکھائی	84%	16%
خط یا درخواست	97%	3%
بولنے اور پڑھنے کی صلاحیت	96%	4%
املا	94%	6%

3.4.8. School Council's Feedback

School councils were also asked to provide their input on their involvement in key areas of the school. Their responses are given below.

The table below provides an overview of the number of meetings members of school councils have done in schools.

Table 19: Frequency of School Council Meetings

Number of School Council Meetings during a Year	%
1 to 2	8
3 to 5	22
6 to 8	23
9 to 12	45

In the meetings, key issues are discussed with the following frequency:

Table 20: Areas of Discussion in School Council Meetings

	Always	Mostly	Sometimes	Never
School infrastructure	43%	44%	10%	1%
Students' performance	67%	27%	4%	1%
Community participation	28%	40%	26%	4%
Budget utilization	71%	22%	3%	1%
Teachers' training	42%	35%	18%	4%
Financial assistance of students (shoes, uniform)	40%	38%	19%	2%
Books and AV aids for school	36%	37%	22%	3%
Sports and competitions in school	26%	40%	29%	3%
For students learning and discipline	70%	24%	4%	1%
To increase the enrolment in school	73%	22%	3%	1%
To save the record of the school council.	59%	29%	9%	1%
Teaching and co-curriculum Support	49%	39%	9%	1%
For the Hygiene of the students	55%	34%	9%	1%
With the consultation of the head, the member is included	61%	29%	8%	1%

The different activities in which the school council participates are given in the table below.

Table 21: School Council Participatory Activities

Activities	%	Activities	%
Improve school discipline	35%	Improve teaching-learning process	27%
School Construction	26%	Planning to use NSB funds	52%
Solve students' problems	36%	The hiring of temporary teachers	13%

The suggestions given by different council members for further strengthening the functioning of the school council are as follows:

Table 22: Suggestions given by School Council Members

Suggestions	Percentage of responsesby members
Increasing Members of the school council	6%
Assigning set responsibilities to each member	42%
Having more cooperation with the school's teachers	42%
Needing more training	30%
More use in improving the teaching-learning environment	27%
Collecting funds for the school.	17%

The suggestions given by different council members for the usage of the NSB funds are as follows

Table 23: Suggestions by Council Members for the usage of NSB Fund

Suggestions	Percentage of responsesby members
Improving the teaching-learning process	55%
Motivating teachers by giving them prizes/incentives	7%
Increasing recruitment of temporary teachers to assist with shortages	21%
Provision of financial support to needy children/students	34%
Procurement of more school resources	24%
Organizing of sports activities for children	26%
Improving basic facilities	62%
Motivating students by giving them prizes/incentives	24%
Increasing trainings to teachers	10%
Purchase of school uniforms and shoes for needy children/students	36%
Procurement of library books	17%
Procurement of science lab materials	21%

3.4.9. Parents' feedback

Parents were asked questions to assess their satisfaction with the school.

Results show that:

- 1% of parents are not satisfied with the school's performance. The most common reason is the 'Deficiency of basic facilities in School.'
- Less than 2% of the parents mentioned that their children are not given homework.
- 45% of the parents further stated that their children are taking tuition for additional support.

Table 24: Parent Observation about their children

Parents Observation	%
Parents considered the school a safe place for their children.	98%
Parents mentioned that children spend most of their time watching TV and physical exercise	73%
Parents indicated that their children read books other than their textbooks.	70%
Parents identified that the most common reason for taking off from school is the child's illness which is the same as 84% of students.	86%

The following suggestions were provided by parents for school improvement:

Table 25: Parent Suggestions for School Improvement

Suggestions	%
Need to have a hard-working head teacher and decision-maker.	23%
Need for timely distribution of textbooks to the students	11%
Need for regular visits to be made by the education department.	19%
Need to engage parents in school activities.	58%

Recommendations

4. Recommendations

To bring improvement to the system, a collective effort is needed by stakeholders at the provincial, district and school levels. The findings of the results lead to the following recommendations:

4.1. School Education Department (SED)

- Policy directions are needed to support teachers in improving classroom instructions through need-based professional development programmes and sufficient budget allocation for teaching resources.
- In-depth diagnostic studies to be carried out to find the causes of lower performance in the identified subject.
- Student-Teacher Ratio (STR) needs to be revisited with the appointment of more qualified teachers.
- Direction is needed to facilitate NSB funds utilization for the following identified areas:
  - Improve basic facilities
  - Improve teaching-learning process
  - Organizing sports activities for children
  - Support needy students

4.2. Quaid-e-Azam Academy for Educational Development (QAED)

- Teachers need to be provided lesson plans in digital formats with classroom support by head teachers to ensure consistent utilization.
- Need-based continuous professional development programmes to be initiated through district QAEDs with classroom observation to ensure implementation of learnings from training and providing feedback.
- In collaboration with PEC, specialized training on “Understanding Cognitive Levels” and “How to respond to Constructed Response Questions” should be designed and conducted to improve teachers’ understanding.
- QAED should use LSA findings to give the teachers topic-specific training in core subjects of Science, Mathematics, English and Urdu; primarily focusing on the following topics as flagged “difficult” by the teachers and also scored lowest by the students:

Science	Mathematics	English	Urdu
Chemical Reactions	Financial Arithmetic	Teaching poems	Comprehension
Acids, Alkalis, Bases, and Salts	Fundamentals of Geometry	Teaching prose	Grammar
Measurements of Physical Quantities	Practical Geometry	Creative Writing	Creative Writing
Lenses	Demonstrative Geometry	Precise/Summarizing	
Electricity in Action	Introduction to Trigonometry	Oral Communication	
Exploring Space	Information Handling	Phonetics	

For details, please refer to the annex 1.

- Skill-based training on strengthening teachers' interpersonal skills is to be added to the induction and promotion-linked training programmes of QAED. In addition, head teachers should be provided leadership training focusing on managerial skills.

4.3. Punjab Curriculum & Textbook Board (PCTB)

- PCTB should use LSA findings to provide feedback to textbook authors and subject specialists.
- Challenging SLOs should be revisited in the textbook to improve further.
- Textbooks also are to be distributed with supplementary materials on time to ensure proper use in schools.
- Supplementary reading material may be provided to the schools to improve student's vocabulary and reading skills.

4.4. Program Monitoring and Implementation Unit (PMIU)

- Schools with missing facilities should be identified and prioritized while developing infrastructure.
- Usage of teacher guides needs to be added as a performance indicator for schools/teachers.
- Teachers' observation feedback should be provided timely to bring improvement.

4.5. District Education Authorities (DEAs)

- DEAs must ensure timely resource distribution, including textbooks and lesson plans.
- Monitoring plans should include teachers' use of resources and participation in professional development programmes.

  Soft skills like commitment, hard-working and decision-making skills may be considered when selecting Head teachers for the schools.
- Teachers should be provided mentoring through headteachers.
- Schools need to be encouraged to engage parents in their children's learning process.
- There is a need to assign responsibilities to each member of the School Council member and provide them training.

4.6. SCHOOL

- Head teachers should collaborate closely with teachers and develop a learning environment in the school.
- Teachers to be encouraged to use the following practices as it improves students learning:
    - Effective use of whiteboards.
    - Activity-based teaching.
    - Inclusion of Outdoor Activities.
    - Asking Questions from students.

- Provide students opportunities to ask questions.
- Responds to Student's Question.
- Check homework regularly and provide feedback for improvement.
- Act as a Problem Solver.
- Exhibit positive and friendly behaviour.

- Reading competitions should be organized to develop interest amongst students in reading and improve their vocabulary.
- More co-curricular activities should be organized to develop social skills amongst students.
- Schools should promote positive norms and behaviors among students through collaborative learning, group activities, sharing of lunch boxes and fund-raising activities.
- Teachers should provide constructive feedback to the students on their classwork as well as homework.
- Provision should be made to invite guest speakers to discuss different topics/concepts at the school to improve classroom instructions.
- Head teachers should connect with community members through school councils to develop linkages for improving students' academic performance.
- Schools should plan for regular engagements of parents through PTMs and informal sessions on positive parenting, how to support students' learning at home and how to address absenteeism issues.

4.7. PARENTS

- Parents should participate in all school activities, especially in parenting sessions and co-curricular activities.
- Parents need to communicate with their children about their learning process.
- Parents should attend PTMs with informal check-ins with the head teacher and class teachers on students' progress.

5. Conclusion

The execution of the new Assessment Policy Framework (APF) 2019 demands PEC take many parallel initiatives. The successful conduct of LSA for Grade 5 and Grade 8 is one of these initiatives. The representative samples at the provincial and district level help to identify areas for improvement and develop need-based and relevant programs for teachers and schools.

The report provided findings of the assessment that was conducted on a representative stratified sample of 3300 schools across 36 districts of Punjab. Following a thorough consultative process, PEC developed assessment instruments that were administrated with the help of trained test administrators. Using OMR for MCQs and engaging trained markers for CRQs helped to maintain data reliability. The findings based on descriptive and regression analyses informed the overall student learning scores and identified factors influencing students' learning. The recommendations provided at the end will help all concerned institutions to pay attention to the identified areas, initiate relevant programs and help teachers make deliberate efforts to improve classroom instructions.

Though this assessment is based on the provincial curriculum 2006, it helped PEC establish its systems which include regular engagement of concerned departments and teachers from public and private schools, development of SOPs, creating and training a pool of item writers and markers, and following all steps of assessment cycles along with a robust monitoring and dissemination plan. Using its findings, PEC will strengthen LSA for 2023, which will be based on Single National Curriculum (SNC) and serve as a future baseline.

6. Annexes

Annex 1 – Difficult SLOs

In the following SLOs, the percentage of correct responses was less than 50%. Therefore, QAED needs to organize training in these areas, whereas PCTB may review and edit the content given in the textbooks to help teachers and students improve their understanding. Similarly, teachers are required to pay extra attention to these topics and use differentiated teaching techniques to ensure learning for all students.

English:

SLOs

1. Build and use appropriate vocabulary and correct spelling for effective communication:
    a. Examine and interpret transitional devices that show comparison, sequence, result, conclusion, cause and effect, addition, and reason.
    b. Illustrate the use of a dictionary for finding appropriate meaning and correct spellings.
    c. Use a simple thesaurus to locate synonyms and antonyms.
    d. Utilize comparison, appositive phrases, and synonyms to deduce the meaning of unfamiliar words.
    e. Understand and utilize similes and metaphors given in the text.
    f. Analyze analogies; complete analogies correctly.
    g. Understand and correctly use phrasal verbs given in the text/glossary.
2. Recognize the rules of, and change the narration of statements, requests/orders and questions.
3. Write a guided paragraph on a given topic. Recognize that:
    a. The introductory paragraph carries the main idea of the essay.
    b. Each one of the body paragraphs develops the main idea through key ideas. These key ideas are developed through supporting details.
    c. The concluding paragraph contains a summary of the body paragraphs and a general concluding statement.
    d. Paragraphs are linked through various transitional devices.
4. Apply summary skills to familiar/unseen passages and poems to write summary/ précis of simple passages (summarize verses).
5. Read a story to retell it sequentially,
    a. Summarize and analyze story elements: characters, events, setting, plot, theme, and tone.

b. Summarize text to analyze characters, their motives, actions and emotional responses.

c. Recognize the author's purpose. Identify the speaker or narrator in a selection.

d. Read a text to analyze characters, motives, actions and emotional responses.

e. Present a character sketch orally and in writing.

f. Give a personal answer about the characters giving reasons to support the response.

g. Recognize genres of literature, e.g. fiction, poetry, legend and myth.

6. Apply strategies to comprehend questions by marking keywords, verbs and tenses in a variety of question types; Literal, textual, factual, Interpretive Inferential, Personal response, Evaluative and Open Ended.

7. Demonstrate the use of common and proper collective nouns.

8. Choose appropriate synonyms and antonyms from the thesaurus.

a. Write a simple unified paragraph on a given topic:

b. Write a clear topic sentence using specific words, vivid verbs, modifiers, etc.

c. Add adequate supporting detail (example, illustration, definition, evidence, comparison, contrast, cause and effect) to develop the main idea.

d. Use appropriate pronoun-antecedent relationships and transitional devices within a paragraph.

e. Use chronological, sequential or spatial order of arranging detail.

f. By order of importance (most important to least important and vice versa, general to specific and vice versa).

Some examples:

Q. Read the following stanza and choose the poetic devices used.

Q. He said to me, "Where are you going?" The indirect narration of the above sentence is:

Q. Summarize the following stanza in your own words. Use correct punctuation, grammar and spelling.

Q. Plantation is a good activity. Look at the picture and write how to grow plants in 6 sentences. Use correct punctuation, grammar and spelling.

Q. Rewrite the events given in the form of sentences by arranging them meaningfully to make a story.

Q. Paraphrase the given stanza in your own words. Use correct punctuation, grammar and spelling.

Q. Read the paragraph carefully. Use information from the text and write a suitable title for the paragraph.

Mathematics

SLOs:

1. Solve real life problems involving linear equations.
2. The sum of measures of the three angles of a triangle is 180^{o}.
3. Solve right angled triangle using Pythagoras theorem.
4. Solve real life problems involving mean (average), weighted mean, median and mode.
5. Solve simple real-life problems related to individual income tax assessment.

Some examples:

Q. Zara is 20 years older than her daughter Fatima. In three years, Zara will be thrice as old as Fatima. How old are they now?

Q. Prove that the sum of measures of the three angles of a triangle is 180^{o}.

Q. The table given below shows number of marks obtained by the students of a class. Find the number of students having marks more than '4'. Also calculate average marks of the students.

Q. The annual income tax at the rate of 5% paid by Hammad is Rs. 1000. What is the total annual income of Hammad? (Hint: 5% of the amount exceeding Rs. 400,000)

Science

SLOs:

1. Describe the term atmospheric pressure.
2. Draw and label human excretory system.
3. Differentiate between mitoses and meiosis.
4. Plan and conduct a campaign that can help reduce air pollution in environment.
5. Explain the energy changes in chemical reactions
6. Explain the balancing of a chemical reaction.
7. Describe the image formation using a lens by ray diagram
8. Identify the technological tools used in space exploration

Some examples:

Q. A man climbed to the top of a very high mountain. While on the top of the mountain, he drank all the water in his plastic water bottle and then put the cover back on the bottle. When he returned to the camp in the valley, he discovered that the empty bottle had collapsed. Which of the following explains correctly as to why do this happen?

Q. Draw and label the diagram of kidney.

Q. Write importance of mitosis and meiosis.

Q. Write importance of exothermic reaction during ignition of dynamites in mining.

Q. Balance the following chemical equation and write down its steps.

Q. Define hydrolysis with the help of a balanced chemical equation.

Q. An astronaut is in a spacecraft in space. If he wants to communicate with Earth, what technological tool will he use for communication?

اُردو

حاصلاتِ تعلم

کسی بھی عام متن پر سوالات کے جوابات تحریر کر سکے۔

مثال

مستقبل کے معمار سے مراد ہے.

ہیڈماسٹر صاحب نے ا پنی تقریر میں کیا کہا؟

Punjab Examination Commission

Link Wahdat Road, Near Pilot Boys High School,

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