2013 Learning Assessment of SEQAEP Institutions

Public Report

Australian Council for Educational Research

10/15/2014

This Page has been left blank intentionally

Table of Contents

List of Tables

List of Figures

This page has been left blank intentionally

Executive Summary

A representative Sample of 7143 Grade 6 and 7169 Grade 8 students from 309 SEQAEP institutions representing 125 upazillas participated in 2013 Learning Assessment in Bangla, English and Mathematics. At each grade students responded to multiple choice questions and constructed response questions designed to measure what they know and can do across the assessed subjects.

Bangladesh has recorded impressive progress in poverty reduction and focus on human resource development has been at the core of Bangladesh's development efforts. The Secondary Education Quality and Access Enhancement Project (SEQAEP) started in 2008 in 122 upazillas and it has now extended to 125 upazillas throughout Bangladesh. The SEQAEP project is designed to provide equal opportunities and enhance the quality of education at the secondary education level to low socio-economic sections of society in Bangladesh. One of the prime aims of SEQAEP project is to improve literacy and numeracy, including learning of English; therefore interventions providing support to schools have been designed and implemented. The impact of these interventions is now monitored by quality learning assessments.

The Learning Assessment of SEQAEP Institutions (LASI) 2013 is the second cycle. The first cycle was conducted in 2012 in July with Grade 9 students to assess Grade 8 end-of-year learning outcomes. The data collected from the 2012 cycle has provided robust baseline information and a valid scale for monitoring educational outcomes over time and monitoring progress.

Comparison between 2012 (Grade 9) and 2013 (Grade 8) in this report should be read keeping in mind that while the tests for both cycles were developed using the Grade 8 curriculum, the 2012 tests were administered to Grade 9 students in July. These students had completed the Grade 8 curriculum six months earlier and had completed nearly half of the Grade 9 curriculum. The 2013 tests were administered to Grade 8 students in December when they had just completed the Grade 8 curriculum and before they commenced the Grade 9 curriculum. Both these cohorts had been exposed to the entire Grade 8 curriculum, however the 2012 cohort was 6 months older and had additional but untested curriculum exposure. The program was extended in 2013 to include Grade 6 students.

Common item equating methodologies were employed to link the 2013 Grade 6 and Grade 8 tests and also to link the 2013 tests back to the 2012 established scale. In 2013 common questions (items) were included in grade 6 and grade 8 tests in each subject; there were also common questions (items) between the 2012 test and the 2013 test. This common item equating methodology allowed for all items and students within each subject to be reported

on the established 2012 subject scale. Further technical information on this methodology is provided in the equating section of the Technical Report.

In addition to students responding to achievement tests in Bangla, English and Mathematics, background questionnaires were administered to students, teachers and head teachers to collect demographic and attitudinal data.

Key Highlights

- Students achieved significantly higher in Bangla in 2012 (Grade 9) than in 2013 (Grade 8). The Bangla mean scale score (BSS) in 2012 was 300 compared to 283 in 2013. There was minimal change in student achievement in English and mathematics. The English mean scale score (ESS) in 2012 (Grade 9) was 300 compared with 294 in 2013 (Grade 8). The mathematics mean scale score (MSS) was 300 in 2012 and was 299 in 2013.
- Relative achievement in Examination Boards changed from 2012 (Grade 9) to 2013 (Grade 8). In 2012 Barisal had the highest means scores in English and mathematics and Khulna had the highest mean in Bangla. In 2013 Barisal had the highest mean score for both grades in all three subjects.
- Sylhet had the lowest mean performance in all subjects in 2012 (Grade 9) and 2013 (Grade 8).
- The General Education and Madrasah schools are disaggregated to other types- Junior Secondary Schools, Secondary Schools, Higher Secondary and Dhakil Madrasah, Alim Madrasah and Fazil Madrasah respectively but because the numbers were small for the purpose of reporting the schools have been clubbed together. In both 2012 (Grade 9) and 2013 (Grade 8) General Education schools achieved higher mean scores than Madrasah Education Schools in both grades and in all subjects.
- There was no significant difference in performance between boys and girls in 2012 or 2013, suggesting higher levels of gender equity in the Bangladesh education system than in other Asian and European countries.
- Grade 8 student achievement was significantly higher than Grade 6 and indicates a strong learning growth in all subjects.
- LASI 2013 between-school variations in learning achievement in both grades and in all three subjects was very high, suggesting large differences in instruction quality in SEQAEP schools.

Performance by Subjects

Performance of students has been reported in Bands (achievement levels). The Bands provide a more generalised picture of development in a subject, by reporting percentages of students in particular score ranges and are useful as a frame of reference for monitoring growth between grades and over the years of the intervention. Band 1 is the basic level of proficiency while Band 5 is the highest skill level.

Bangla

Mean performance of students at Grade 6 was 248 and 283 at Grade 8. It indicates a strong learning growth between the two grade levels.

- 11 per cent of Grade 6 students and 49 per cent of Grade 8 students demonstrated reading skills of band 4 and 5 levels. Students at this level are able to draw inferences in complex texts, interpret, infer and synthesise information to arrive at a conclusion. Students performing at bands 4 and 5 are also likely to have acquired the skills of all lower bands.
- 32 per cent Grade 6 and 38 per cent Grade 8 students demonstrated band 3 reading skills. Students at this level demonstrate an ability to connect related information and interpret actions, behaviour and emotions of a character in simple narrative texts. They understand the meaning of moderately difficult words in context. Students performing at band 3 are also likely to have acquired the skills of all lower bands.
- 41 per cent Grade 6 and 12 per cent Grade 8 students demonstrated band 2 skills. Students at this level are able to draw very simple inferences by connecting information across sentences and interpret explicitly stated information from more complex texts. They know the meaning of simple but less common words.
- Only 1 per cent of Grade 8 students and 16 per cent of Grade 6 students demonstrated band 1 skills. Students at this level have acquired only basic reading skills. They are able to retrieve information from short simple texts.
- There was no significant difference in gender performance.
- General Education schools performed slightly higher than the Madrasah Education schools in Grade 6 and considerably high at Grade 8.

English

- Mean performance of students at Grade 6 was 273 and 294 at Grade 8. It indicates a strong learning growth between grades.
- 8 per cent students of Grade 6 and 34 per cent students of Grade 8 achieved in bands 4 and 5. They demonstrate well developed understanding of interpreting complex texts, and identify implicit attitude of the writer in a persuasive text.
- 32 per cent of Grade 6 students and 42 per cent of Grade 8 students achieved in band 3. These students demonstrate an ability to make simple inferences by connecting information, understand sequence of events in texts, and show knowledge of simple grammatical concepts.
- 18 per cent of Grade 6 students and 3 per cent of Grade 8 students achieved in band 1. These students acquired some basic English language skills. They locate explicit stated information from short and simple texts.
- The gender differences are small, favouring boys, in both grades. This is counter to the pattern of gender differences seen in many other countries.

- General Education schools performed moderately higher than Madrasah Education schools at Grade 6 and considerably higher at Grade 8.

Mathematics

- Mean performance of students at Grade 6 was 284 and at Grade 8 was 299. It indicates a strong learning growth between grades.
- 18 per cent of Grade 6 students and 35 per cent of Grade 8 students achieved in bands 4 and 5. These students demonstrate a well developed understanding of mathematical concepts. They have developed reasoning and problem solving skills.
- 18 per cent of Grade 6 students and 26 per cent of Grade 8 students achieved at band 3 level. Students at this level solve problems involving different mathematical operations, simplify algebraic expressions.
- 26 per cent of students at Grade 6 and 9 per cent of students at Grade 8 achieved at band 1 level. Students at this level have acquired skills to use routine processes, demonstrate an understanding of whole numbers, and recognise properties.
- General Education schools performed slightly higher than Madrasah Education schools at Grade 6 and moderately higher at Grade 8.

Performance between years

- In 2012 (Grade 9) students performed better in Bangla than in 2013 (Grade 8). The mean performance of students in 2012 was 300 while in 2013 it was 283.
- In 2012 (Grade 9) students performed slightly better in English than in 2013 (Grade 8). The mean of students in 2012 was 300 while in 2013 it was 294.
- In 2012 (Grade 9) students performed about the same in mathematics as in 2013 (Grade 8). The means were 300 and 299 respectively.
- Barisal Examination Board mean performance improved for all subjects in 2013.

Results for Socio-economic background

International research studies indicate that a supportive home and school environment has a high impact on student performance. The approach of analysis for this report takes into account selected variables at the same time. It means that it represents the effects between teacher and student level variables and achievement while all other significant effects are already taken into account. For example, father's education has a positive effect on achievement even after the positive effect on achievement of instructional strategies as reported by students has been taken into account. The LASI background questionnaire analysis findings are:

Student factors impacting learning outcomes

- Students who indicate that they belong to a tribe perform at a significantly lower level than their peers in Bangla, English and Mathematics. This trend is observed both in Grade 6 and 8.

- Students whose fathers have experienced more than primary school education perform at a higher level than students whose fathers are illiterate or have completed only primary school.
- Students who report that their teachers make the classes and learning interesting, explain things clearly and want to help students to learn perform at a higher level than their peers in Bangla, English and Mathematics.
- No differences in student performance emerge depending on different perceptions regarding the academic self-assessment students have. In other words, students who report being keen, successful and good students do not perform at a higher level than their peers with a lower general academic self-assessment.
- Students who report greater levels of being hit or threatened by other students, disruptive behaviour of other students in class and other students spreading rumours about them perform at a lower level in Bangla, English and Mathematics.
- Students who do not repeat a class perform better than students who are repeating a class.
- Receiving PMT stipend is not conclusively indicating having any effect on student achievement.

Teacher factors impacting learning outcomes

- Students in schools where more teachers report having a Masters level qualification performed at a higher level in English but not in Bangla or Mathematics.
- Students in schools where more teachers report having a Bachelor of Education degree perform at a higher level in Bangla and English but not in Mathematics.
- There was insufficient variance to conclusive inform the link between teacher qualification and student achievement as 94 per cent of teachers answered "yes" to the question "Have you received SSC Teacher Incentive Award from SEQAEP in 2012?"
- Students in schools where teachers report having more years of teaching experience perform at the same level as students in schools where teachers reported having less teaching experience in Bangla, English and Mathematics.
- Students taught in schools where teachers have been teaching for longer perform at a higher level than students in schools where teachers have shorter teaching experience.
- Schools where Head Teacher reports high teacher efficiency has higher student achievement.
- Student achievement is low in schools / divisions where Head Teachers perceives that the school recourses are inadequate.

Chapter I Introduction

The Secondary Education Quality and Access Enhancement Project (SEQAEP) is one of the biggest projects under taken by the Directorate of Secondary and Higher Education (DESHE), in Bangladesh. The main objective of the SEQAEP is ensuring quality education and equitable access for poor students at secondary level. The program is being implemented in 125 selected Upazillas. The Monitoring and Evaluation Wing (MEW) is responsible for monitoring and reporting on the implementation of SEQUAEP. Assessment of teaching-learning outcomes is one of the identified key indicators and is managed under the aegis of MEW.

1.1 Learning Assessment of SEQAEP Institutions

The Learning Assessment of SEQAEP Institutions (LASI) was established in 2012 as one of the key performance indicator for the SEQAEP institutions. Modern test theory, specifically Item Response Theory (IRT) methodology was adopted to develop subject educational measurement scales that allow valid and reliable monitoring of progress in learning over time. The first cycle conducted in 2012 was in July with Grade 9 students assessed on the Grade 8 competencies. In 2013 the testing program was extended to include Grade 6. From the 2013 LASI results it is possible to describe the trajectory of learning between Grades 6 and 8 and to describe the variation in achievement between the 2012 and 2013 SEQEAP cohorts.

The LASI is a useful program to provide a feedback to the teachers, policymakers and stakeholders alike – to establish what students are achieving in Bangla, English and mathematics and to identify areas of concern. By repeating LASI at regular intervals the data can be used to measure trends in achievement and progress and the quality of education to inform quality-related policies and the effectiveness of interventions in SEQAEP institutions. LASI has been established to answer the following questions:

- How well are the students learning in the SEQAEP institutions?
- Is there evidence of strengths and weaknesses in areas of students' knowledge and skills?
- How are sub-groups performing in the SEQAEP institutions?
- What factors are associated with student achievement?
- Does the achievement of students change over time?

LASI is an annual sample-based assessment program conducted in Grades 6 and 8 of SEQAEP institutions in Bangla, English and Mathematics. A representative, random sample of students is drawn from the SEQAEP institutions to take part in the testing program. Students studying in SEQAEP institutions from 125 Upazillas representing all divisions were chosen to participate in the assessment. LASI tests are equated so that 2013 results can be validly compared with those of 2012.

The 2012 LASI results were reported using three achievement scales – Bangla reading, English reading and Mathematics – and these scales make it possible to report students from 2013 cycle and all future cycles on the same scales, providing valid comparisons between grades and between years.

1.2 LASI Assessment Instruments

Since one main focus of the SEQAEP project is to improve literacy and numeracy skills, the LASI assesses these skills and collects survey data on other factors known to impact on the quality of literacy and numeracy learning.

A rigorous process for test development was adopted. The content of the Bangla, English and mathematics tests was determined by the specifications provided in the assessment framework for each subject. These frameworks, which describe the specific knowledge and skills to be assessed in each subject, were developed in consultation with the National Curriculum and Textbook Board (NCTB), who provided academic and curriculum expertise. The Australian Council for Educational Research (ACER) provided MEW with technical assistance in developing the tests. MEW and NCTB subject experts reviewed the tests prior to piloting to ensure that the tests reflected the intent of the national curriculum – both the acquisition and application of basic skills in each subject. All tests were piloted with approximately 450 students from 30 schools to ensure the measurement properties of each question and final tests were selected by MEW and NCTB in consultation with ACER.

In all three subject tests multiple choice questions and constructed response questions were included and each question was classified according to the cognitive domain it addressed: knowledge, understanding, and application.

Tables 1 and 2 provide a matrix of the cognitive skills and the sub-strands in the final tests for Grades 6 and 8 in each subject.

Table 2 Grade 6 **Items by Sub Strands and Skills – Bangla, English & Mathematics**

Subjects	Sub Strands	Knowledge	Understanding	Application	Total Items	Percentage
Bangla	Reading Comprehension	5	18	9	32	82%
	Grammar	1	0	2	3	8%
	Vocabulary	4	0	0	4	10%
Total Items		10 (26%)	18 (46%)	11 (28%)	39	
English	Reading Comprehension	10	12	2	24	65%
	Grammar	0	0	6	6	16%
	Vocabulary	4	3	0	7	19%
Total Items		14(38%)	15(40%)	8 (22%)	37	
Mathematics	Algebra	3	5	0	8	21%
	Data	2	2	1	5	13%
	Geometry	3	2	1	6	16%
	Measurement	0	3	3	6	16%
	Number	7	4	2	13	34%
Total Items		15 (40%)	16 (42%)	7 (18%)	38	

Table 3 Grade 8 Items by Sub Strands and Skills – Bangla, English & Mathematics

Subjects	Sub Strands	Knowledge	Understanding	Application	Total Items	Percentage
Bangla	Reading Comprehension	7	16	8	31	77.5%
	Grammar	2	0	2	4	10%
	Vocabulary	2	3	0	5	12.5%
Total Items		11 (27.5%)	19 (47.5%)	10 (25%)	40	
English	Reading Comprehension	7	17	5	29	74%
	Grammar	1	0	4	5	13%
	Vocabulary	3	2	0	5	13%
Total Items		11 (28%	19 (49%)	9 (23%)	39	
Mathematics	Algebra	4	4	0	8	20%
	Data	1	2	3	6	15%
	Geometry	2	3	2	7	17.5%
	Measurement	2	3	2	7	17.5%
	Number	3	1	8	12	30%
Total Items		12 (30%)	13 (33%)	15 (37%)	40	

1.2.1 Bangla

The Bangla curriculum expects the consolidation of learners' skill in using the language for effective communication. The Bangla tests focuses on the reading of written Bangla. The tests assessed reading comprehension, vocabulary and grammar, as defined by the curriculum. The fundamental skills of reading comprehension remain the same across grade levels. However, **the** difficulty of the texts and the complexity of the task increase in the higher grade.

Some texts and some questions were common to Grade 6 and 8. This enables valid comparison of the reading ability of students across grade levels. The Bangla reading tests included a variety of appropriate text-types that deal with familiar and grade-relevant contexts. The texts were similar to those used in the text book, but were not taken from the text book. The assessment included three broad categories of texts:

Imaginative text: texts that involve the use of language to represent, recreate, shape and explore human experiences in real and imagined worlds. They include, for example, fables, short stories, novels, plays, poetry.

Informative/descriptive texts: texts that involve the use of language to represent ideas and information related to people, places, events, things, concepts and issues. They include, for example, reports, descriptions, biographies, explanations, news articles.

Argument / persuasive texts: texts that systematically present a point of view or seek to persuade an audience. They include, for example, formal essays, letters, advertisements, interviews and reviews.

Exhibit 1 Types of text in Bangla

The tests ensured coverage of an appropriate balance of content; various skills related to reading comprehension (including the ability to locate, identify, interpret, infer and

synthesise information) as well as aspects of language use such as vocabulary and grammar were tested. Questions were classified as per the cognitive domains – knowledge, understanding and application.

1.2.2 English

The curriculum expects the students to acquire the basic skills of the global language, to prepare them for its use in higher education and in their working life. The English tests assessed reading comprehension, vocabulary and grammar as defined by the curriculum. The fundamental skills of reading comprehension remain the same across grade levels. However, the difficulty of the texts used and the complexity of the task increased in the higher grade. Some texts and some questions were common to Grade 6 and 8. This enables valid comparison of the reading ability of students on the same scale across grade levels.

The tests included a variety of appropriate text-types that deal with familiar and grade-relevant contexts. The texts had contexts similar to those used in the text book, but were not taken from the text book.

The assessment included three broad categories of texts:

Imaginative text: texts that involve the use of language to represent, recreate, shape and explore human experiences in real and imagined worlds. They include, for example, fables, short stories, novels, plays, poetry.
Informative/descriptive texts: texts that involve the use of language to represent ideas and information related to people, places, events, things, concepts and issues. They include, for example, reports, descriptions, biographies, explanations, news articles.
Argument / persuasive texts: texts that systematically present a point of view or seek to persuade an audience. They include, for example, formal essays, letters, advertisements, interviews and reviews.

Exhibit 2 Types of text in English

Both the Grade 6 and Grade 8 tests contained continuous and non-continuous texts. Non-continuous texts present information in, for example, charts and graphs, forms and information sheets and much of the English-text reading required of Bangladeshis will be reading these kinds of texts for work and for further education. The tests assessed various skills related to reading comprehension (including the ability to locate, identify, interpret and infer information) as well as aspects of language use such as vocabulary and grammar.

1.2.3 Mathematics

The mathematics curriculum focuses on developing student ability to apply methods and skills logically and analytically; and to develop problem-solving skills in their day to day life.

At each grade the mathematics framework is organised around two dimensions: content (number, algebra, geometry and data) and cognitive skills. The table below summarises the content domains and the cognitive domains.

Grade 6

Number Properties and Operations
It measures students' understanding whole numbers, fractions, decimal numbers and their operations and application in real life situations. The topics in this strand include:
-comparing, ordering, number operations (whole numbers, fractions and decimals), simplifying numerical expressions, applications of the fundamental operations, factors and multiples, HCF and LCM of whole numbers, ratios, percentages and unitary method

Measurement and units of Measurement
This measures students' knowledge and understanding of different concepts of measurement and applying them in real life context. The topics in this strand include:
-Measuring/ reading scales of measures, conversion between different units of measure of length, mass, capacity, and time and applying the concepts of measures in unitary method. Calculating area and perimeter of familiar shapes.

Algebra
measures the student's ability of handling abstract ideas of concrete conceptual ideas present in the curriculum. The topics in this strand include:
-continuing number patterns, identifying like and unlike terms, expressions that represent a situation presented in words or otherwise, simplifying simple algebraic expressions.

Space and Geometry
measures students' understanding of geometrical shapes. The topics in this strand include:
- Knowledge of properties of familiar two- dimensional and three-dimensional shapes, applying properties to solve simple routine problems.

Data
Data measures students' understanding of handling information. The topics in this strand include:
- Reading simple graph, matching graphs with data calculating mean identifying mode of ungrouped data only

Exhibit 3 Content areas Grade 6 mathematics

Grade 8

Number Properties and Operations
measures students' understanding numbers and their application in real life situations. The topics in this strand include:-Understanding of integers, rational numbers, ratios and proportions. They include use of numbers in real life contexts involving calculations in simple interest, profit-loss transactions, speed-distance-time problems

Measurement and units of Measurement
This measures students' knowledge and understanding of different measurement and applying them in real life context. The topics in this strand include: conversion between different units of measure of area, conversion between volume and capacity, and applying the concepts of measures in calculating areas perimeter of complex rectilinear shapes.

Algebra
This measures the students' ability of handling abstract ideas of concrete conceptual ideas present in the curriculum. The topics in this strand include: Simplifying algebraic expressions, adding, subtracting and multiplying algebraic expressions, factorising expressions. Matching expression that represent a situation presented in words or otherwise, solving linear equations in one variable, identifying situations and graphs that match a linear equation that matches a given equation. It also involves use of algebraic processes to solve problems in other areas of mathematics.

Space and Geometry
Space and Geometry measures students' understanding of geometrical shapes including basics of coordinate geometry. The topics in this strand include:-Apply properties of lines, angles triangles and quadrilaterals to solve problems. Locating points on a coordinate plane, identifying the graphs of linear equations in two variables

Data
Data measures students' understanding of handling information. The topics in this strand include:

-Reading and interpreting and drawing inferences from data and graphical representations, Applying the understanding of mean in real situations. Working out the mean, median and mode of a ungrouped data set.

Exhibit 4 Content areas Grade 8 mathematics

The content domain of mathematics tests had questions that vary in difficulty from ones that test basic skills (identifying fractions, prime factorisation of two-digit numbers adding decimal numbers with equal decimal places) to questions that require fairly advanced skills (using proportions in graphs, reasoning with geometric figures to solve problems). The Knowledge cognitive domain questions require students to recall facts and procedures; the Understanding domain questions require students to draw conclusions, inferences, differentiate or explain concepts; the Application domain requires students to relate understandings of mathematical concepts in a variety of familiar and unfamiliar situations.

1.3 LASI Questionnaires

Analyses of these questionnaires were undertaken using hierarchical linear modeling analysis (HLM) to address a number of questions that were conveyed to ACER by the Monitoring and Evaluation Wing (MEW) of the Department of Secondary and Higher Education, Bangladesh. This report is designed to answer some of the policy questions as follows:

1. *What is the link between home environment and student achievement?*
2. *What is the link between parent qualification and student achievement?*
3. *What is the link between classroom instruction and student achievement?*
4. *What is the link between SEQAEP instruction and student achievement?*
5. *What is the link between teacher qualification and student achievement?*

It should be noted that HLM rather than single level analytical techniques were used to examine effects between background variables and performance that take into account:

a) the clustered nature of the data whereby students are located within schools, hence enabling appropriate conclusions regarding the significance or otherwise of results;

b) other variables that are known to have relevant links with student achievement such as gender or home background. In other words, all effects discussed in this report can be observed while - at the same time - the effects of all other variables on achievement are held constant.

The two-level HLM analyses used student responses at level 1 and the average of teacher responses within a school at level 2. Analyses were combined for students in Grade 6 and 8 as teachers could not be linked to a Grade level or individual students. Hence, student responses were considered to reflect the range of student performance across Grades 6 and 8 in a school while teacher responses were considered to reflect the average characteristics of teachers at a school to which students in both Grades were exposed.

1.4 LASI population and sample coverage

The LASI target population includes all students of Grade 6 and 8 from all SEQAEP schools from 125 upazillas of Bangladesh. The sample of schools was selected using the probability

proportionate to size (PPS) sampling model, an established and professionally recognised method of scientific sampling. Out of 6371 educational institutions 239 General Education schools and 70 Madrasha schools were selected. Over 7000 students were randomly selected from the selected institutions. The proportion population percentage coverage from each division is displayed in the table below:

Table 4 Distribution of LASI sample and target population by region

Division	Total SEQAEP Enrolment (G6)	Proportionate (Pop)	Student Sample (G6)	Proportionate Sample	Total SEQAEP Enrolment (G8)	Proportionate (Pop)	Student Sample (G8)	Proportionate Sample
Barisal	64080	10.6	775	10.8	37991	11.1	767	10.7
Chittagong	80880	13.4	833	11.7	44048	12.9	844	11.8
Dhaka	167464	27.8	1978	27.7	97890	28.7	2073	28.9
Khulna	92902	15.4	1244	17.4	60382	17.7	1197	16.7
Rajshahi	77245	12.8	957	13.4	43816	12.9	925	12.9
Rangpur	91882	15.2	1004	14.1	43459	12.8	989	13.8
Sylhet	28690	4.8	352	4.9	13183	3.9	374	5.2
Bangladesh	**603143**	**100.0**	**7143**	**100.0**	**340769**	**100.0**	**7169**	**100.0**

1.5 Administration of Tools and Monitoring

MEW was responsible for supervising all aspects of administration. A firm was appointed to administer the test, mark and prepare data files for analysis. Students randomly selected at each grade took all three tests. The assessment was administered in sampled schools in December 2013. MEW trained the test administrators selected by the outsourced firm and provided them with a test administration manual to ensure high level of consistency of administration in all the SEQAEP institutions. Quality monitors were appointed from MEW who were responsible for random visits to the schools for quality monitoring on the day of the test. To ensure consistency of marking, constructed response questions were marked by teachers specifically recruited and trained for the task.

1.6 Data Management and Analysis of Data

MEW received material from all divisions, work was outsourced to an agency for transfer of data from forms to electronic format. Data entry formats were developed to meet the requirements of data analysis. Quality checks were undertaken by MEW to ensure limiting error percentage. Data was provided to MEW and ACER in soft copy for further checks, clean data files were finalised for analysis.

The Rasch model methodology was applied for analysing the data collected from LASI instruments. The Rasch model is based on Item Response Theory (IRT). This test theory proposes that the relationship between student performance and the probability that the student will answer an item correctly can be described using item characteristic curve (ICC)

(Lawley 1942; Stocking, 1999). The Rasch analysis provides an item map which places the item difficulties (also the item location) and student abilities on the same scale. This is in keeping with the best practice of major international and national surveys such as Programme for International Student Assessment (PISA). In this survey, a one-parameter logistic model was used.

Background factors were analysed after conducting some initial exploratory bivariate correlation analyses in SPSS, hierarchical linear modelling analysis (HLM; Raudenbush & Bryk, 2002) was employed.

1.7 Understanding of Results

Throughout this report results are reported using 'scale scores' calculated using IRT. The measurement scales are fixed so that results from all future surveys can be reported on the same scale. The LASI Bangla, English and mathematics test were scored and reported in two ways:

1.7.1 Scale Scores: Raw score is the number of correct responses that a student achieved on a test. This score is not comparable and is not reliable for monitoring learning progress over time or learning growth between grades. To enable comparisons, reliability and for reporting the average performance of students, the test scores are transformed into scale score so that students from different grades and all cycles of the learning assessment can be placed on a single scale.

Scale score is the mathematical transformation of individuals' raw scores in order to report each test taker's score on a continuum consistently over the years and across different version of tests. The scale score provides a comparable metric, across all the tests within a subject. The IRT analyses allow for test difficulty and student ability to be reported independently on the same scale. In addition, a scale score of 100 will mean the same in 2013 as it did in 2011.

Exhibit 5 Scale score

The statistically obtained scale scores reported onto a measurement scale accounts for differences in difficulty between tasks and between forms. The scale scores are anchored to a mean score and a standard deviation. In LASI the scale score for 2013 have been anchored to the 2012 mean scale score of 300 with a standard deviation of 25.

1.7.1 **Competency (skill) bands:** Band is the reference indicator of student's level of proficiency in subjects against the competencies assessed in the test. They help to understand and compare present and future performances of the students. To interpret achievement the subject expert team examined the content of the items and analysed them to describe achievement for each subject to a scale according to what students know and can do at different points on the scale. The descriptive scales were written to define the skills that students acquired at Grades 6 and 8, measured by scale score. The competency levels for LASI 2013 are described in Exhibit 5 and figure 1 as bands with cut off points. Band 1 is indicative of the lowest achievement level and band 5 indicates high achievement.

Based on the curriculum documents and the complexity of competency levels assessed by the tests, five bands of achievement have been developed for each subject. Each band provides a more generalised description of the skills associated with that part of the scale.

1.7.2 Statistical Significance

All measures have a degree of uncertainty associated with them. It is important to know the degree of uncertainty about the measures when reporting performance of groups so that only real differences in performance are reported. Difference between the scores of groups of students can occur because of random fluctuation. A test of statistical significance at the 0.05 level has been applied to the NSA 2011 as well as 2013 data. All reported differences in the performance of groups have been tested for significance and there is a 95 per cent likelihood that the difference did not occur by chance.

1.7.3 Effect Size

Effect size or standardised mean difference is calculated to understand whether the *magnitudes of effects* are substantively or practically important. This is a matter of particular interest to policymakers and various other stakeholders. Effect size is the proportion of the mean difference of the standard deviation. The magnitude of effect size can be low, moderate or large between two groups under discussion.

> An effect size of about 0.20 is considered "small"; about 0.50 is considered "medium"; and about 0.80 is considered "large."

Exhibit 6 Effect size

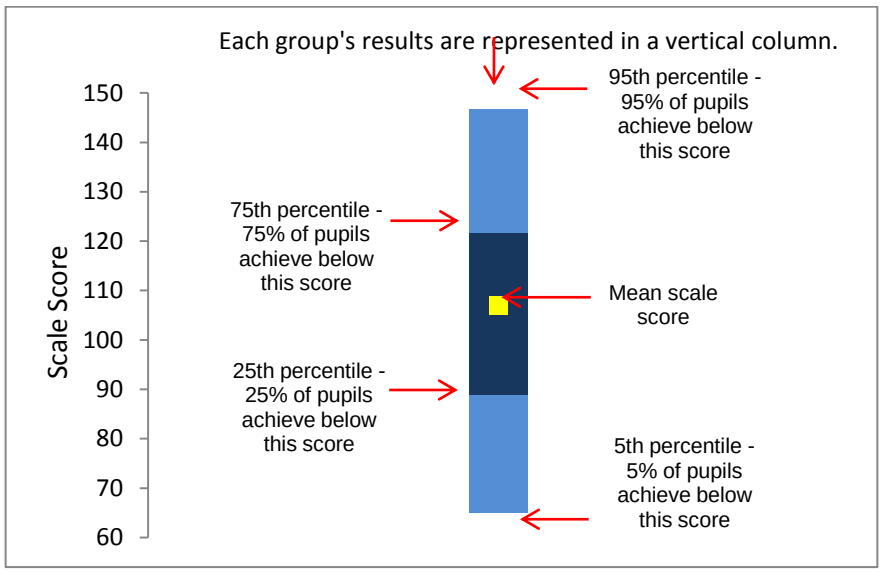
1.7.4 Percentiles

Percentile scores provide information about the relative performance of lower, middle and higher performing students, results are displayed at five key percentiles (5^{th}, 25^{th}, 50^{th}, 75^{th} and 95^{th}). For example, the score at the 25^{th} percentile is the score which 75 per cent of students achieve or surpass, and the score at the 95^{th} percentile is the score that 5 per cent of students achieve or surpass. The range between the 25^{th} and 75^{th} percentiles (the inter-quartile range) represents the performance of the middle 50 per cent of students. This, therefore, is a good indicator of the degree of homogeneity within a student cohort.

> A percentile is a measure used in statistics indicating the value below which a given percentage of observations in a group of observations fall. For example, the 20th percentile is the value (or score) below which 20 percent and above which 80 per cent of the observations may be found.

Exhibit 7 Percentile

Figure 1 How to read graphs

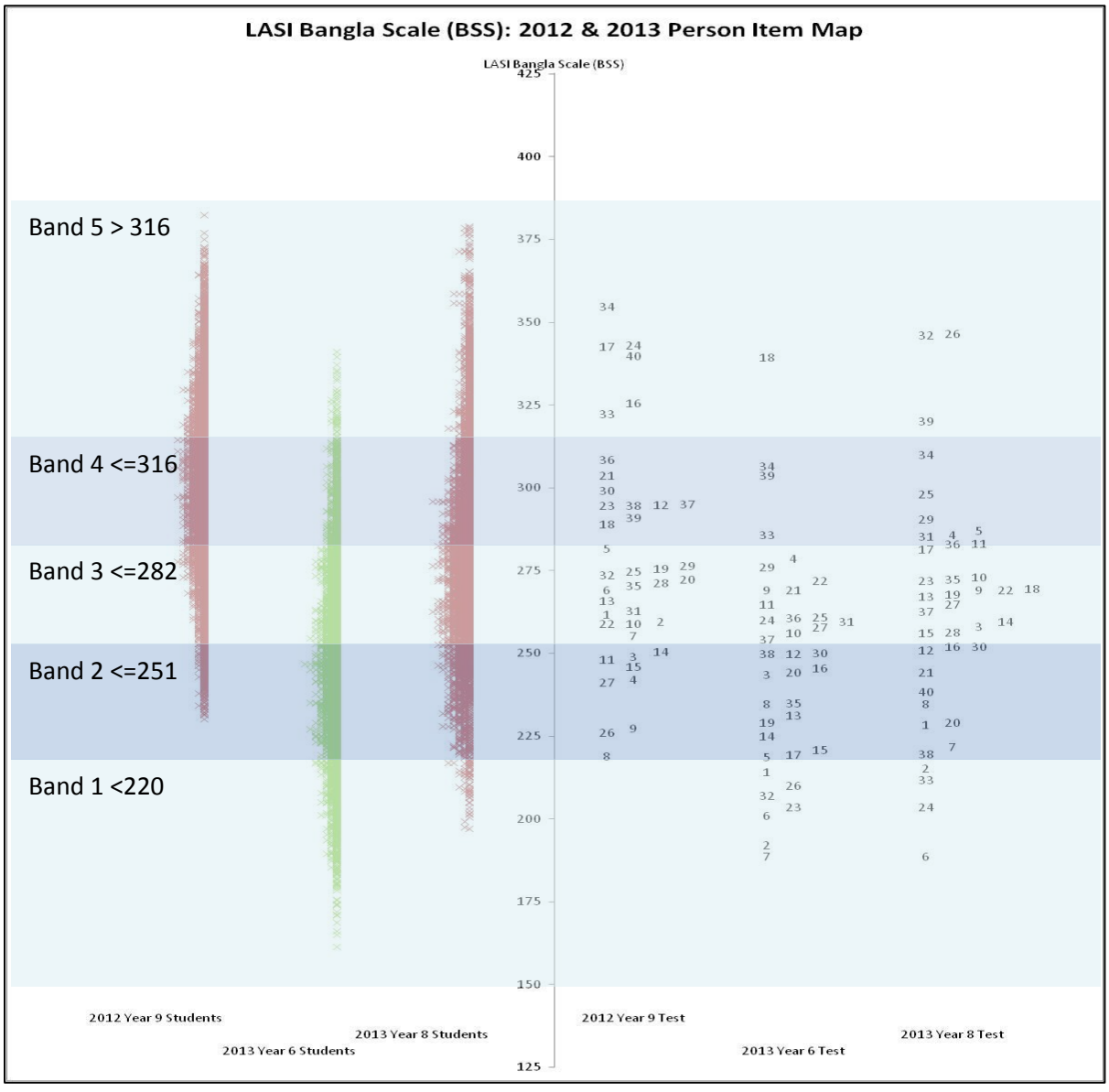


Chapter II Bangla Achievement

Success in reading provides the foundation for achievement in other subjects and meaningful participation in adult life. Learning how to read and write requires effort because it cannot be achieved without mastering a collection of complex skills. Becoming a proficient reader is a goal that requires practice and dedication[1].

2.1 Bangla Scale Score Map

Figure 2



[1] PISA 2009 Results: What Students Know and Can Do: STUDENT PERFORMANCE IN READING, MATHEMATICS AND SCIENCE Volume I.

2.2 Analysis of questions by Content and Cognitive skills

The analysis of content and cognitive domains (fig. 3 and 4) reveals that Bangla test questions had a range of difficulty; some knowledge questions were as difficult as, or more difficult as application questions. Questions from content area show a range of difficulty also indicating that Grade 8 test was more difficult than Grade 6. Grammar questions seem to be slightly harder than vocabulary questions while comprehension questions have a wide range of difficulty. Students in band 1 and 2 are unlikely to have answered the grammar questions correctly.

Fig. 3 shows the distribution of student achievement, question difficulty separated by cognitive domain as well as reporting bands for Grade 6 (left-hand display) and Grade 8 (right-hand display). The fig 4 shows the distribution of student achievement and question location separated by content areas for Grade 6 (left-hand display) and Grade 8 (right-hand display).

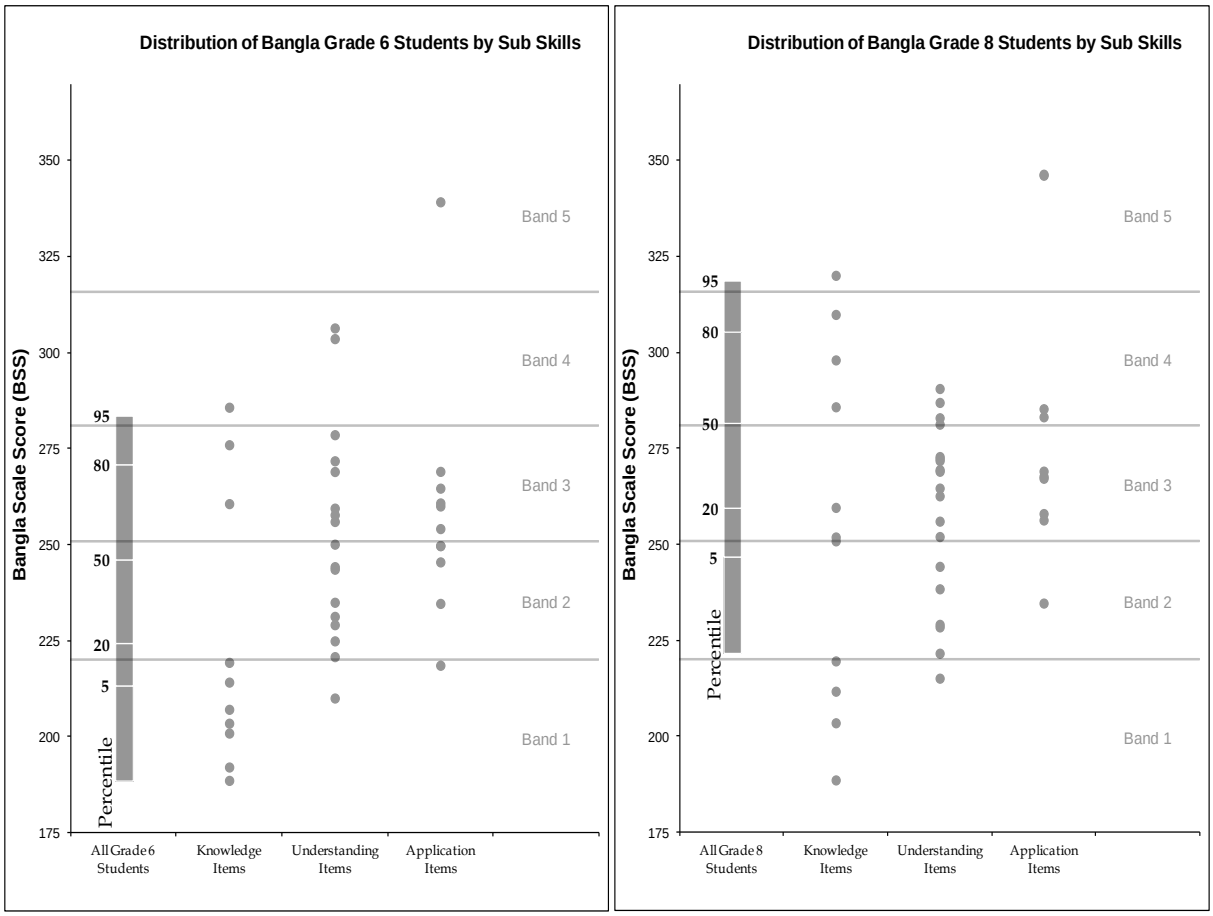


Figure 3 Bangla achievement and item locations by sub skills

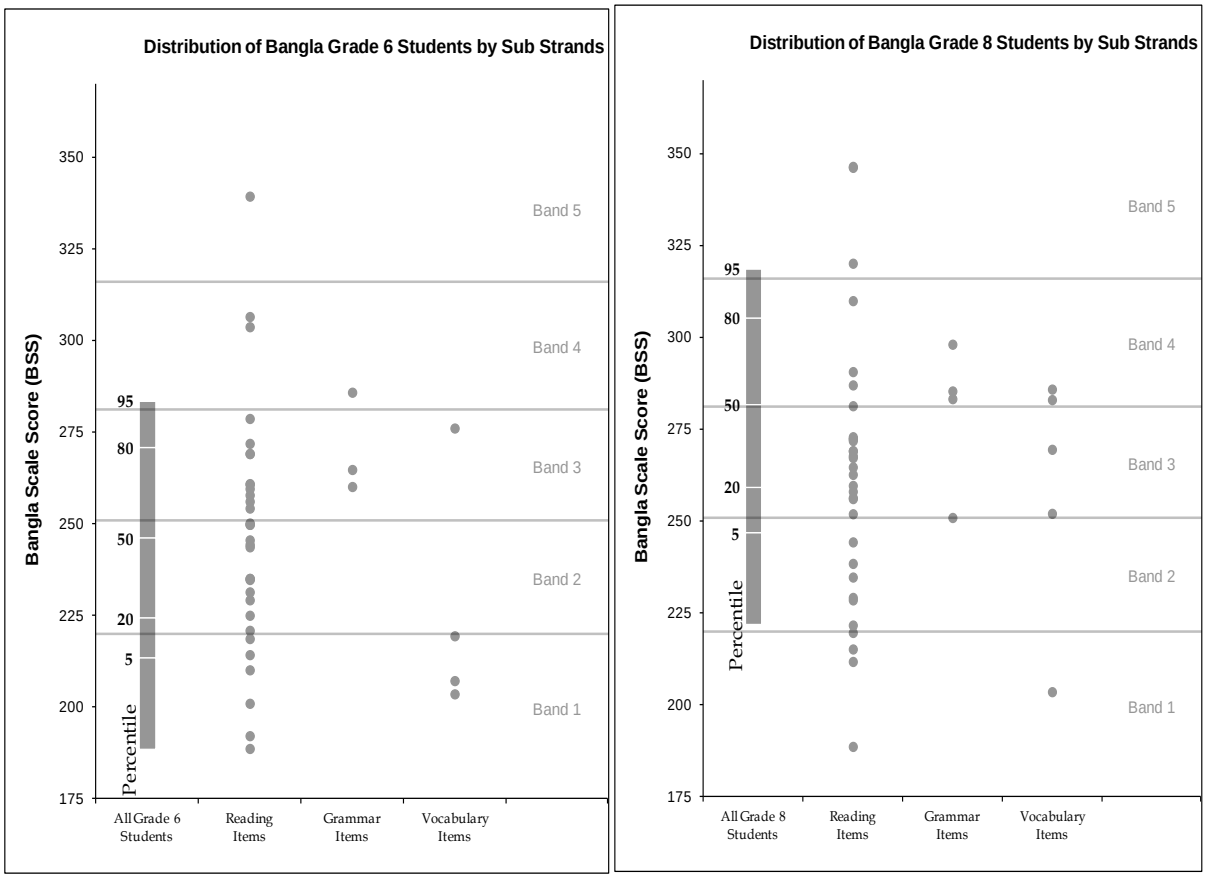


Figure 4 Bangla achievement and item locations by sub strands

Note: where question difficulties are the same within a content or cognitive skill, the question locations appear as overlayed dots.

2.3 Benchmarking of Bangla Language

Based on all questions, broad descriptions of skills have been developed. They provide a more generalised picture of development in Bangla and are useful as a frame of reference for monitoring growth between years.

Exhibit 8 below describes the skills demonstrated by the student at each of the five band benchmarks.

Band	Descriptors
Above 316 5	***Students at this level:*** explain textual inference; infer from implicit information in dense and complex texts and synthesise information to arrive at conclusions.
316 4	***Students at this level:*** draw inferences and identify the purpose in more complex texts; provide information explicitly presented in texts by retrieving or interpreting details; understand the meaning of a difficult word in context and identify the suffixes and types of compounding.
282 3	***Students at this level:*** draw inferences by connecting related information or using prior knowledge; show understanding of sequence implicit in narrative and informative texts; interpret actions, behaviour and understand emotions of characters in simple narrative texts and interpret other details in dense or longer texts; interpret words and phrases and identify their intended effect in texts; understand the meaning of moderately difficult words in context; identify synonyms and antonyms of less common words; show evidence of knowledge of word formation (Sandhi Vichedh) and identify the correct use of exclamation marks in context.
251 2	***Students at this level:*** identify the purpose of simple texts; draw very simple inferences by connecting and comparing information across sentences or sections of text; retrieve and interpret explicitly stated information from longer, more complex texts and know the meaning of simple, less common words.
220 1	***Students at this level:*** retrieve explicitly stated information in short, simple texts and identify synonyms and antonyms of simple, common words.

Exhibit 8 Bangla band description

A clear progression in reading skills is apparent on the scale with inferential abilities appearing towards the higher end of the scale and retrieval of details, especially in texts that are easy to read, at the lower end of the scale. The expected progression from being able to read short simple texts to longer, more complex and denser texts is also evident on the scale. Average Grade 6 students demonstrate an ability to draw inferences using prior knowledge and understand implicit sequence; interpret actions, behaviour and other details in denser texts; identify the intended effect of phrases in texts; Understand the meaning of

a moderately difficult words; Show evidence of knowledge of word formation (Sandhi Vichedh); Show some knowledge of punctuation. Average Grade 8 students have skills to draw inferences and identify the purpose in more complex texts; write out information explicitly provided in texts by retrieving or interpreting details; interpret information, character emotions in dense text; understand the meaning of difficult words in context and show improved knowledge of word formation.

Constructed response items where students need to write a response rather than select the answer from the options provided tend to be the more difficult items.

Table 5 Band distribution in Bangla language by Grade

Grade	Band 1	Band 2	Band 3	Band 4	Band 5
Grade 6	16%	41%	32%	10%	1%
Grade 8	1%	12%	38%	38%	11%

Students in Band 1 read short, simple texts; they locate and retrieve explicitly provided information in the text and identify synonyms and antonyms of some commonly used words.

16 per cent of Grade 6 students and very few (1 per cent) Grade 8 students achieved within band 1 which is well below the level expected of Grade 6 students.

At Band 2, students begin to make very simple inferences. They also interpret information and identify the purposes of simple texts and they retrieve and interpret details explicitly stated in slightly more complex and longer texts. They also identify the meaning of words that are slightly less common.

Forty one per cent of Grade 6 students and 12 per cent Grade 8 students achieved at band 2.

In Band 3, students draw inferences by connecting related information and drawing on their prior knowledge, identify sequence implicit in different types of texts, identify emotions and motivations of characters in imaginative texts, and reflect on the intended effect of phrases or words. They retrieve directly stated information from some texts that are dense and challenging. However, they are unable to yet infer or draw conclusions from implicit information in these types of texts.

They demonstrate more sophisticated vocabulary knowledge, some knowledge of word formation (Sandhi Vichedh) and can identify the correct use of punctuation.

Nearly, one third (32 per cent) of the students in Grade 6, and 38 per cent of students in Grade 8 achieved at band 3.

At band 4, students read more complex texts and draw inferences from them. They identify the purpose of such texts. It is at this level that students generate independent written responses to questions that require location of directly stated information. They identify the meaning of difficult words and identify suffixes and the type of compounding.

Ten per cent of Grade 6 students and over a third (38 per cent) of Grade 8 students achieved at band 4.

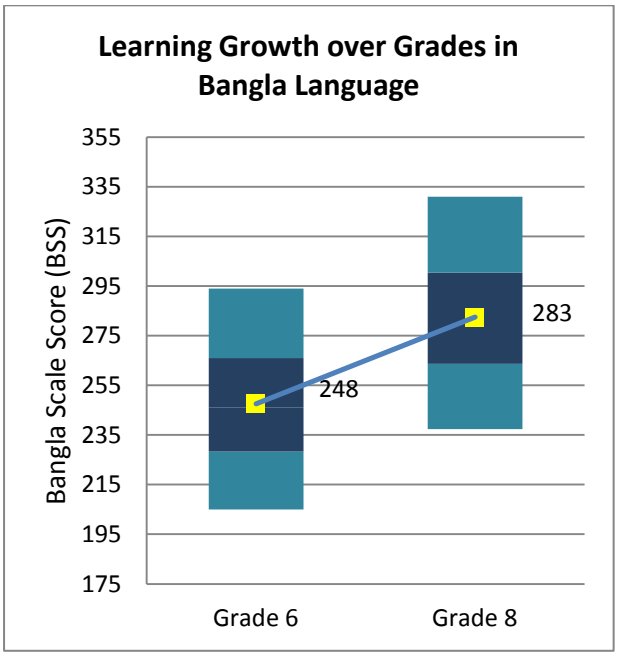
Students in band 5 read challenging and dense texts and infer or synthesise information to draw conclusions. They can write their conclusions in response to texts without the support of multiple choice options.

2.4 Bangla Language achievement by Grade

Table 6 Bangla language achievement by grade

Grade	Number of Students	Mean	Std. Deviation	Minimum	Maximum	Effect Size
Grade 6	7143	247.5	27.1	157.1	345.3	1.3
Grade 8	7169	282.5	28.1	194.1	383.4	

Figure 5: Learning growth in Bangla language between Grade 6 and 8



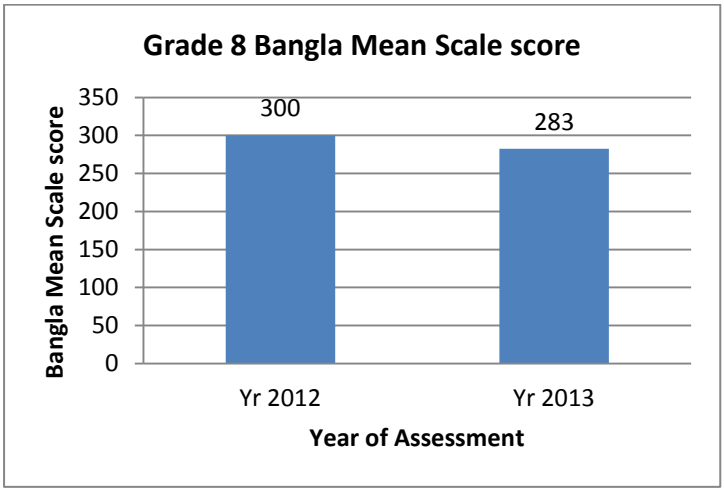
The mean scale score for Bangla is 248 (band 2) for Grade 6 and 283 (band 3) for Grade 8. This difference is strongly significantly. The effect size of 1.3 indicates a large difference in average Bangla achievement between Grade 6 and 8, showing strong learning growth between these two grades. The inter-quartile ranges for both grades suggest a homogenous target population. The range between the 5th and the 95th percentiles respectively show the extreme low and high achievement.

2.4.1Trends in Grade 8 Bangla achievement between 2012 (Grade 9) and 2013 (Grade 8)

Table 7 Trend in Bangla achievement over the years

Year	Number of Students	Mean	Std. Deviation	Effect Size
Yr 2012(Grade 9)	8278	300.0	25.0	0.66
Yr 2013 (Grade 8)	7169	282.5	28.1	

Figure 6 Trend in Bangla achievement between 2012 and 2013



The mean BSS in 2012 (Grade 9) was higher by 17.5 score points, from 300 in 2012 to 283 in 2013 (Grade 8). The effect size of .66 indicates a medium difference.

2.4.2 Trends in Bangla band distribution

Table 8 Trends in Bangla band distribution

Year	Band 1	Band 2	Band 3	Band 4	Band 5
Yr 2012		3%	21%	50%	26%
Yr 2013	1%	12%	38%	38%	11%

Variation in per cent of student achievement is evident within a band. 11 per cent students achieved in band 5 in 2013 as against 26 per cent students in 2012.

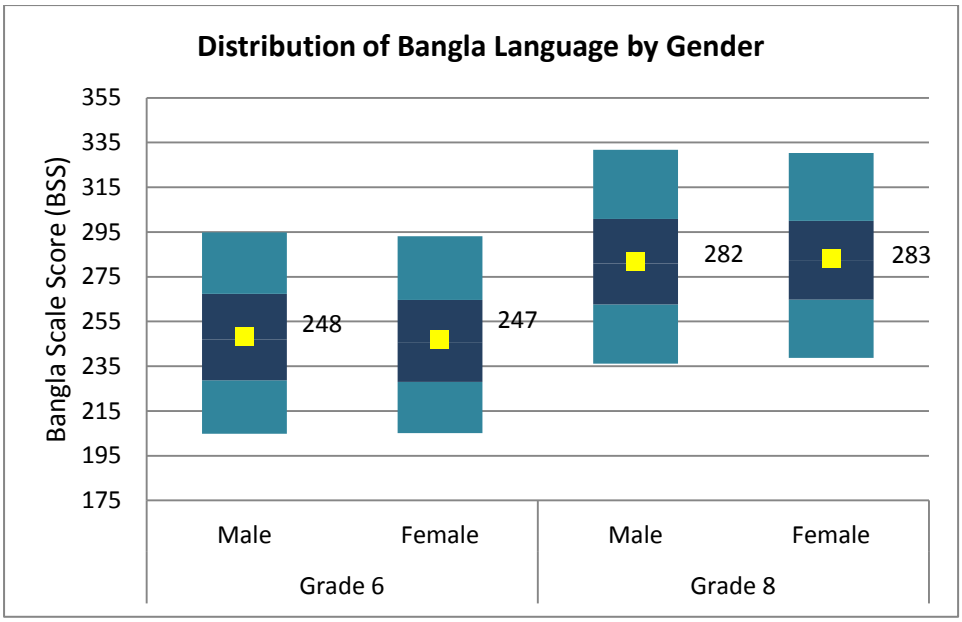
These results should be interpreted with caution. The 2012 cohort was 6 months older than the 2013 cohort and had progressed through about half of the grade 9 curriculum at the time of testing.

2.5 Bangla Language achievement by Gender

Table 9 Bangla language achievement by gender

Gender	Grade 6			Grade 8		
	Number of Students	Mean	Std. Deviation	Number of Students	Mean	Std. Deviation
Male	3456	248.3	27.5	3656	282.0	28.6
Female	3687	246.8	26.8	3513	283.0	27.6
Total	7143	247.5	27.1	7169	282.5	28.1
Effect size		0.1			0.0	

Figure 7 Distribution of Bangla language by gender



The percentile distribution and the per cent distribution across the bands as shown in Figure 7 and Table 9 of both the grades for boys and girls is nearly the same. It indicates that boys and girls performed very similarly in Bangla language.

Bangla gender differences are small at Grade 6 and at Grade 8 there is no significant difference between girls and boys. Similarity in language performance of boys and girls was observed in the 2012 data. Such results are contrary to results observed in monitoring programs in other parts of the world and suggest a higher level of gender equity. It is a very interesting and positive phenomenon that invites further investigation.

Table 10 Band distribution in Bangla language by Gender

Grade	Gender	Band 1	Band 2	Band 3	Band 4	Band 5
Grade 6	Male	15%	40%	33%	11%	1%
	Female	16%	42%	32%	10%	1%
Grade 8	Male	1%	13%	37%	37%	12%
	Female	1%	11%	38%	39%	11%

2.5.1 Trends in Bangla Achievement between years by Gender

Table 11 Change in Grade 8 Bangla achievement between 2012 and 2013 by Gender

Gender	Year 2012 (Grade 9)			Year 2013 (Grade 8)			Effect Size
	Number of Students	Mean	Std. Deviation	Number of Students	Mean	Std. Deviation	
Male	4154	299.9	24.6	3656	282.0	28.6	0.67
Female	4124	300.1	25.4	3513	283.0	27.6	0.65
Total	8278	300.0	25.0	7169	282.5	28.1	0.66

Table 10 displays the achievement of boys and girls between 2012 and 2013 cycles. For both boys and girls the achievement dropped by 17 score points. The effect size of .65 and .67 is considered a medium difference.

2.5.2 Change in Grade 8 Bangla Band Distribution between 2012 and 2013 by Gender

Table 12 Trend in Bangla band distribution over the years

Year	Gender	Band 1	Band 2	Band 3	Band 4	Band 5
Yr 2012	Male		2%	22%	50%	26%
Yr 2013	Male	1%	13%	37%	37%	12%
Yr 2012	Female		3%	21%	50%	27%
Yr 2013	Female	1%	11%	38%	39%	11%

The per cent distribution of boys and girls across the bands generally remains similar. During 2012, nearly a quarter of boys and girls achieved Band 5 however, in 2013 only 11 per cent boys and 12 per cent girls achieved Band 5.

2.6 Bangla Language achievement by Examination Board

Table 13 Bangla Language achievement by Examination Board

Examination Board	Grade 6			Grade 8		
	Number of Students	Mean	Std. Deviation	Number of Students	Mean	Std. Deviation
Barisal	775	255.8	27.0	767	291.7	27.1
Chittagong	443	240.2	25.4	427	277.9	26.0
Comilla	390	247.1	28.5	417	278.7	30.0
Dhaka	1978	250.0	26.6	2073	285.2	28.9
Jessore	1244	248.1	26.1	1197	282.5	25.9
Rajshahi	957	246.5	27.4	925	284.1	28.1
Rangpur	1004	244.4	27.1	989	278.0	28.0
Sylhet	352	234.6	25.8	374	266.0	22.9
Total	7143	247.5	27.1	7169	282.5	28.1

Figure 8 Grade 6 distribution of Bangla language by examination board

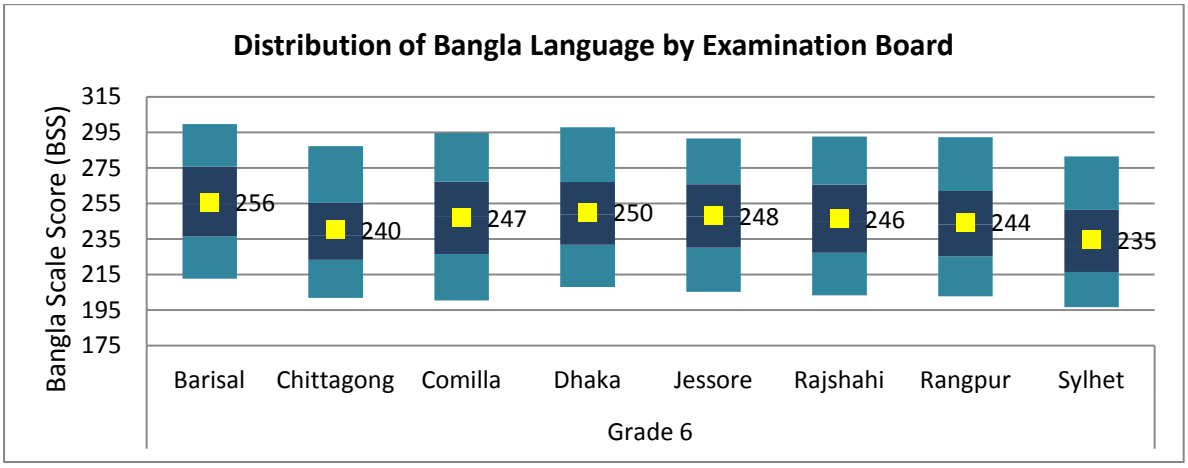
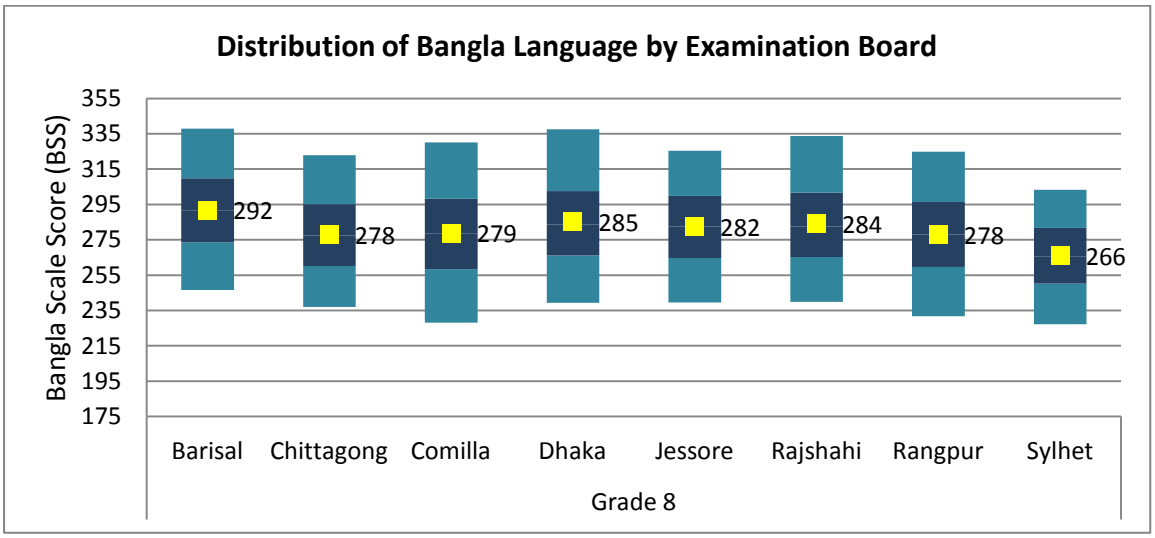


Figure 9 Grade 8 distribution of Bangla language by Examination board



Examination Board differences for Bangla are large between grades. For both Grades 6 and 8, Barisal has the highest mean while Sylhet has the lowest.

Table 12 and Figure 8 indicate that Barisal is the highest performing examination board and Sylhet is the lowest performing board at Grade 6. Further, nearly 5 per cent of students scored below 215 BSS within Barisal board but 25per cent of students scored below 215 BSS within Sylhet board.

Table 12 and Figure 9 indicate relatively similar performance among the Examination Boards, although there is a considerable difference between the highest achieving (Barisal) and Sylhet, the lowest performing board at Grade 8. Nearly 25 per cent of students scored below 275 BSS in Barisal compared to nearly 75per cent in Sylhet board. Comilla has the highest range compared to other examination boards while Sylhet has the lowest range.

2.6.1 Band distribution of Bangla Language achievement by Examination Board

Table 14 Band distribution of Bangla language by Examination board

Grade	Examination Board	Band 1	Band 2	Band 3	Band 4	Band 5
Grade 6	Barisal	10%	34%	37%	18%	1%
	Chittagong	20%	50%	23%	7%	0%
	Comilla	18%	36%	34%	11%	1%
	Dhaka	12%	41%	34%	11%	1%
	Jessore	14%	41%	35%	10%	0%
	Rajshahi	17%	41%	31%	10%	0%
	Rangpur	18%	43%	30%	8%	1%
	Sylhet	32%	43%	20%	5%	
Grade 8	Barisal	0%	6%	30%	45%	19%
	Chittagong	1%	13%	42%	36%	7%
	Comilla	3%	15%	37%	34%	11%
	Dhaka	1%	11%	36%	39%	14%
	Jessore	0%	11%	38%	41%	10%
	Rajshahi	1%	9%	38%	38%	13%
	Rangpur	2%	15%	39%	36%	8%
	Sylhet	2%	24%	49%	23%	2%

The highest performing examination board in both the grades was Barisal with 19 per cent of students in Grade 6 and 64 per cent of students in Grade 8 performing at Band 4 and 5 followed by Comilla and Dhaka with 12 per cent in Grade 6 and Dhaka with 53 per cent in Grade 8. Sylhet performed lowest in Grade 6 with 32 per cent of its students achieving at Band 1.

2.6.2 Trends in Grade 8 Bangla achievement between years by Examination Board

Table 15 Trend in Bangla achievement over the years

Examination Board	Year 2012			Year 2013			Effect Size
	Number of Students	Mean	Std. Deviation	Number of Students	Mean	Std. Deviation	
Barisal	944	301.8	25.5	767	291.7	27.1	0.39
Chittagong	534	293.5	22.6	427	277.9	26.0	0.64
Comilla	522	302.2	22.7	417	278.7	30.0	0.89
Dhaka	2230	302.3	25.0	2073	285.2	28.9	0.64
Jessore	1483	306.6	24.0	1197	282.5	25.9	0.97
Rajshahi	1041	300.0	21.9	925	284.1	28.1	0.64
Rangpur	1122	291.6	26.7	989	278.0	28.0	0.50
Sylhet	402	288.2	24.1	374	266.0	22.9	0.94
Total	8278	300.0	25.0	7169	282.5	28.1	0.66

The effect size .39 for Barisal indicates a low difference between the two years while mean differences for Jessore, Comilla and Sylhet between the two years is significantly high.

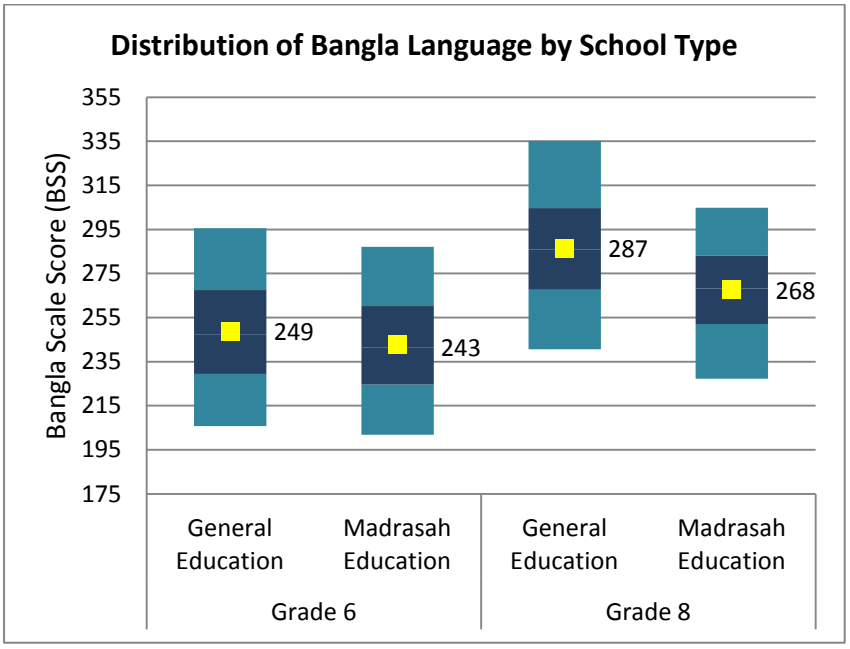
Again, these comparisons should be interpreted cautiously, taking into account curriculum exposure and age differences at the time of testing in 2012 (Grade 9) and 2013 (Grade 8).

2.7 Bangla language achievement by School type

Table 16 Bangla language achievement by School type

School Type	Grade 6			Grade 8		
	Number of Students	Mean	Std. Deviation	Number of Students	Mean	Std. Deviation
General Education	5595	248.8	27.3	5627	286.6	27.9
Madrasah Education	1548	242.8	26.0	1542	267.7	23.4
Total	7143	247.5	27.1	7169	282.5	28.1
Effect Size		0.2			0.7	

Figure 10 Distribution of Bangla language by School type



Institutions were classified as General Education and Madrasah. At Grade 6, General Education and Madrasah had similar mean scores (249 and 243 respectively) while in Grade 8 the difference was quite large with a mean scale score for General Education at 287 and for Madrasah at 268.

The figure 10 above depicts that students from General education were performing better than their Madrasah education counterparts in Bangla language. However, there is relatively less difference between high scorers and low scores within Madrasah education system.

2.7.1Band distribution of Bangla Language achievement by School type

Table 17 Band distribution of Bangla language by School type

Grade	School Type	Band 1	Band 2	Band 3	Band 4	Band 5
Grade 6	General Education	15%	40%	33%	11%	1%
	Madrasah Education	19%	44%	30%	7%	0%
Grade 8	General Education	1%	9%	34%	42%	14%
	Madrasah Education	3%	21%	50%	25%	2%

Students in General Education school type achieved better than students from Madrasah Education. 12 per cent of students from Grade 6 General Education schools achieved at band 4 and 5 while 7 per cent of Madrasah students achieved in band 4. For Grade 8, 56 per cent of students achieved at band 4 and 5 compared to 27 per cent of students from Madrasah Education. Nearly a quarter (24 per cent) of students from Madrasah Education performed at Band 1 and 2 compared to 10 per cent of students from General Education schools.

2.7.2 Trends in Grade 8 Bangla achievement between years by School type

Table 18 Trend in Bangla achievement over the years by School type

School Type	Year 2012			Year 2013			Effect Size
	Number of Students	Mean	Std. Deviation	Number of Students	Mean	Std. Deviation	
General Education	6494	302.7	24.4	5627	286.6	27.9	0.62
Madrasah Education	1784	290.1	24.5	1542	267.7	23.4	0.94
Total	8278	300.0	25.0	7169	282.5	28.1	0.66

2.7.3 Trends in Grade 8 Bangla Band distribution between years by School type

Table 19 Trend in Bangla band distribution over the years

Year	School Type	Band 1	Band 2	Band 3	Band 4	Band 5
Yr 2012	General Education		2%	18%	51%	29%
Yr 2013	General Education	1%	9%	34%	42%	14%
Yr 2012	Madrasah Education		5%	33%	46%	16%
Yr 2013	Madrasah Education	3%	21%	50%	25%	2%

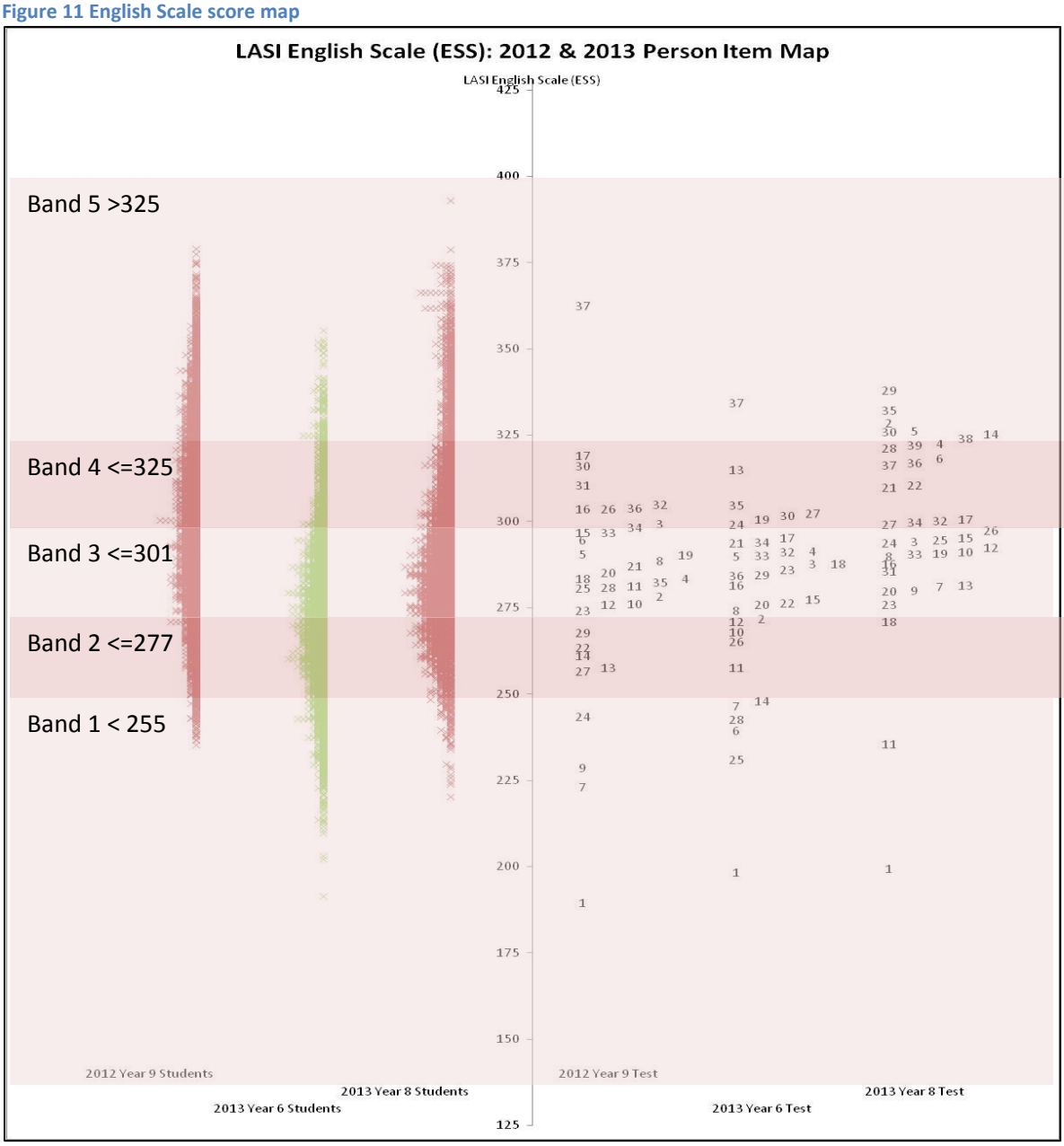
Tables 17 and 18 show that mean BSS of 2012 was higher for General Education schools (303) as against 2013 (287). In General Education schools, 29 per cent of students performed at Band 5 in 2012 while 14 per cent of students performed at Band 5 in 2013. For Madrasah Education schools, 16 per cent of students performed at Band 5 in 2012 while only 2 per cent of students performed at Band 5 in 2013.

Chapter III: English Achievement

The ability to read is fundamental to successfully navigate through the school curriculum. Moreover, it is central to shaping each individual's trajectory through life, his or her economic wellbeing, and the ability to actively and fully participate in broader society. [2]

3.1 English Scale Score Map

Figure 11 English Scale score map



In the ensuing sections, what students know and can do in English language is discussed in detail.

[2] PIRLS 2011 International Results in Reading

3.2 Analysis of questions by content and cognitive skills

The analysis by cognitive and content domains (fig. 12 and Fig 13) reveals that English test questions had a range of difficulty; items ranged in difficulty from the easiest with a scale score of 183 to the most difficult with a scale score of 399. Some knowledge questions were as difficult as application or understanding questions. Questions from the content areas also show a range of difficulty. Grammar questions, as in Bangla, seem to be harder for students and students achieving in band 1 and 2 are unlikely to have answered these questions. Comprehension questions have a wide range of difficulty and therefore even the weakest students were able to answer some of the questions.

Figure 12 shows the item difficulty, distribution of student achievement and the question locations separated by cognitive domains as well as bands for Grade 6 (left-hand display) and Grade 8 (right-hand display). Figure 13 shows the distribution of student achievement and the question location separated by content areas for Grade 6 (left-hand display) and Grade 8 (right-hand display).

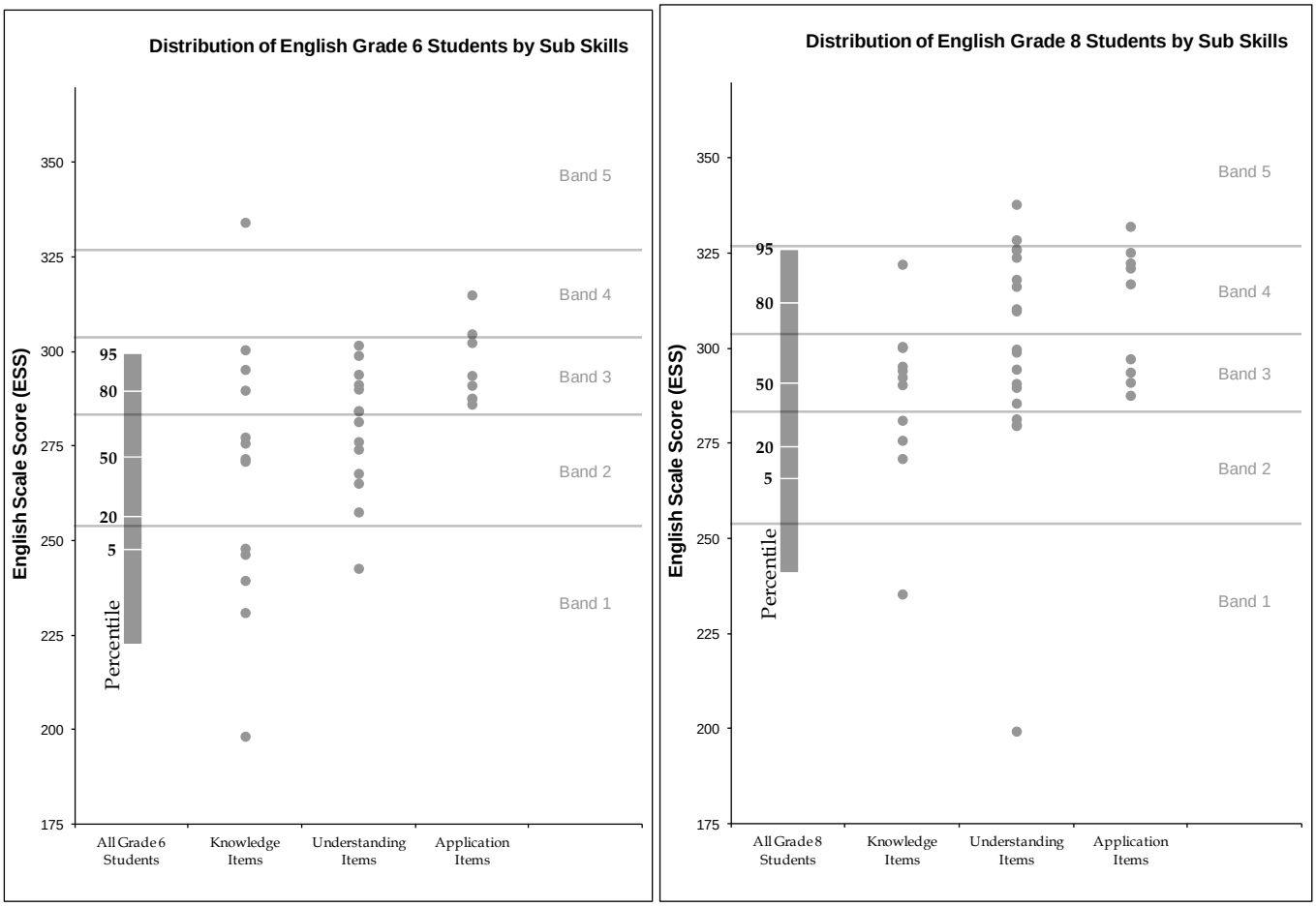


Figure 12 English achievement and item locations by sub skills

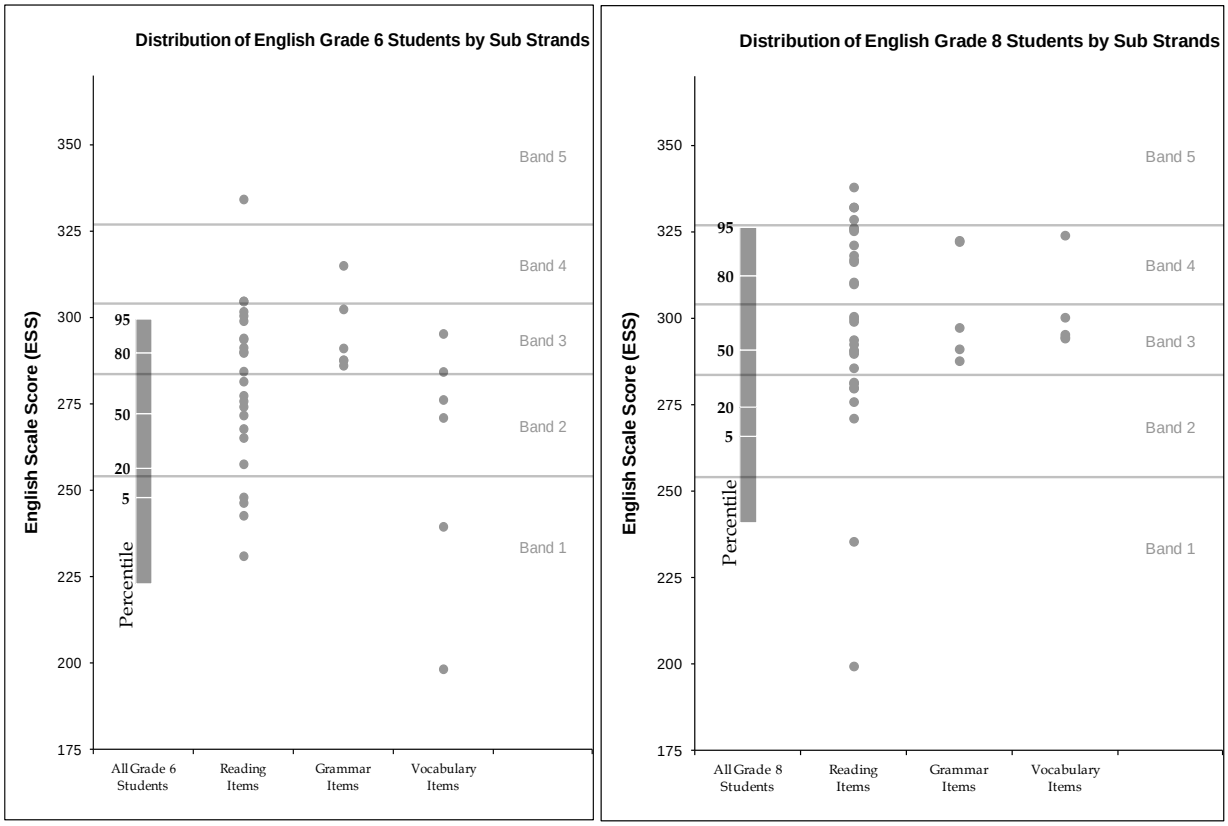


Figure 13 English achievement and item locations by sub strands

3.3 Benchmarking of English Language

The results have been mapped to the bands that align broadly with the curriculum and are presented as broad descriptors of skills. They provide a more generalised picture of development in English and are useful as a frame of reference for monitoring growth between years. Band descriptions for Bands 4 and 5 have been populated and provide more information about what students can do as compared with the descriptions of 2012 cycle.

Band	Descriptor
Above 325 5	***Students at this level:*** identify the implicit attitude of a writer in a persuasive text; backward reference to interpret a pronoun in a text; draw inferences about a character's motivation in a text; comprehend vocabulary in context and identify information explicitly stated in texts and reproduce them.
325 4	***Students at this level:*** understand the main message and themes in more complex texts; identify the meaning of a phrase in complex texts and comprehend complex grammatical sentences in context.
301 3	***Students at this level:*** make simple inferences by connecting information from different parts of short texts; interpret descriptions in texts to identify visuals; understand sequence of events in texts; deduce the meaning of a word from contextual clues; know simple language conventions and abbreviations; show knowledge of simple grammatical concepts such as conjunctions and usage of tenses, including infinitives and correctly use punctuation such as apostrophe.
277 2	***Students at this level:*** interpret information to identify the writer's attitude in short, simple information text; connect and compare information across sentences and sections in short texts and retrieve explicitly stated information in lengthier texts
255 1	***Students at this level:*** locate explicitly stated details from very short and simple texts; know basic vocabulary and match images with basic words.

Exhibit 9 English band description

A clear progression in reading skills is visible on the scale with inferential abilities appearing towards the higher end of the scale and retrieval of details, especially in texts that are easy to read, at the lower end of the scale. The expected progression from being able to read short simple texts to longer, more complex and denser texts is also evident. Average Grade 6 students are able to connect and compare to interpret information across sentences and sections in short texts. They are able to read and retrieve explicitly stated information in long texts. Average Grade 8 students are able to make simple inferences by connecting information and understanding sequence of events in texts; deduce the meaning of a word from contextual clues; know simple language conventions and simple grammatical concepts.

Table 20 Band distribution in English language by Grade

Grade	Band 1	Band 2	Band 3	Band 4	Band 5
Grade 6	18%	42%	32%	7%	1%
Grade 8	3%	21%	42%	23%	11%

Students in Band 1 demonstrate an ability to read short, simple texts. Their ability to engage with these texts is limited. They locate explicitly stated information, understand basic vocabulary and match images with basic words.

18 per cent of the students in Grade 6 and 3 per cent of Grade 8 students achieved at band 1.

Students in Band 2 identify and retrieve details from longer texts. They connect and compare information across sentences and sections in short texts and draw simple inferences.

42 per cent of the students in Grade 6 and 21 per cent of Grade 8 students achieved at band 2

At the Band 3, students identify correct tense, conjunctions, infinitives and punctuation and identify grammatically correct, functional sentences. They also know common abbreviations such as the one used to cite examples (e.g.).

They use contextual clues to relate to specific visuals and process texts in a way which allows them to mentally map and sequence the flow of events. Students also interpret detail in the text to infer main messages.

32 per cent of the students in Grade 6 and 42 per cent of Grade 8 students achieved at band 3.

At Band 4, students correctly identify the main message and themes in more complex texts. They use contextual clues to identify the exact meaning of a phrase in these texts and comprehend complex grammatical sentences in context.

7 per cent of Grade 6 students and nearly a quarter (23 per cent) of Grade 8 students achieved at band 4.

Students in band 5 read challenging texts, identifying the implicit attitude of a writer in a persuasive text, interpret a character's motivation and comprehend vocabulary in context. They are also able to extract and represent relevant detail from a text. They have a degree of mastery over grammatical structures and backward and forward reference to interpret pronouns in a text.

Very few Grade 6 students (1 per cent) and 11 per cent of Grade 8 students demonstrated band 5 reading achievement.

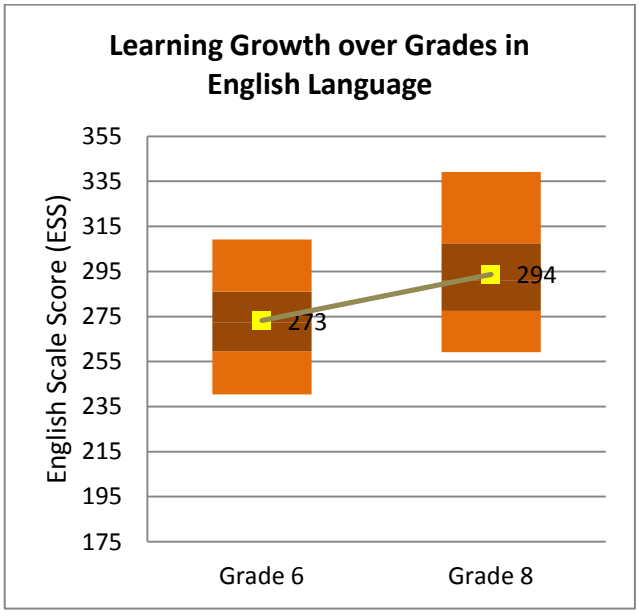
Extracting information from a text and presenting it in written form a higher level skill than selecting a correct answer in a multiple choice format.

3.4 English language performance by Grade

Table 21 English achievement by grade

Grade	Number of Students	Mean	Std. Deviation	Minimum	Maximum	Effect Size
Grade 6	7415	273.2	20.8	189.4	355.3	0.9
Grade 8	7186	293.7	23.8	211.8	393.1	

Figure 14 Learning growth across grades in English language



The English mean scale score for Grade 6 is 273 (band 2) and for Grade 8 is 294 (Band 3). This difference is strongly significant. The effect size indicates that the differences in achievement between these two grades are high. It is indicative of the improvement in learning between grades.

The figure 14 indicates that there is strong growth in learning between Grade 6 and 8 in English language. In Grade 6 the difference between lower achievers and high achievers is relatively less than Grade 8.

3.3.1 Trends in Grade 8 English achievement between years

Table 22 Trend in English language achievement over the years

Year	Number of Students	Mean	Std. Deviation	Effect Size
Yr 2012	8278	300.0	25.0	0.26
Yr 2013	7186	293.7	23.8	

There is a six scale score point differences between 2012 and 2013 cycle. The effect size indicates that the difference is low. Further, standard deviation of two different years indicates that in 2013 the distribution is relatively homogenous as compared to year 2012 distribution.

3.3.2 Trend in Grade 8 English Band distribution between 2012(Grade 9) and 2013 (Grade 8)

Table 23 Trends in English band distribution over the years

Year	Band 1	Band 2	Band 3	Band 4	Band 5
Yr2012	3%	16%	33%	31%	17%
Yr2013	3%	21%	42%	23%	11%

Though the English mean scale score of 2012 (Grade 9) was 300 slightly higher than the mean score 294 of 2013 (Grade 8). The difference between these two years is not statistically significant. The effect size of .26 indicates a small difference.

Nearly 48 per cent of students in 2012 performed at Band 4 and 5 while in 2013 only one third (34 per cent) performed at the two levels.

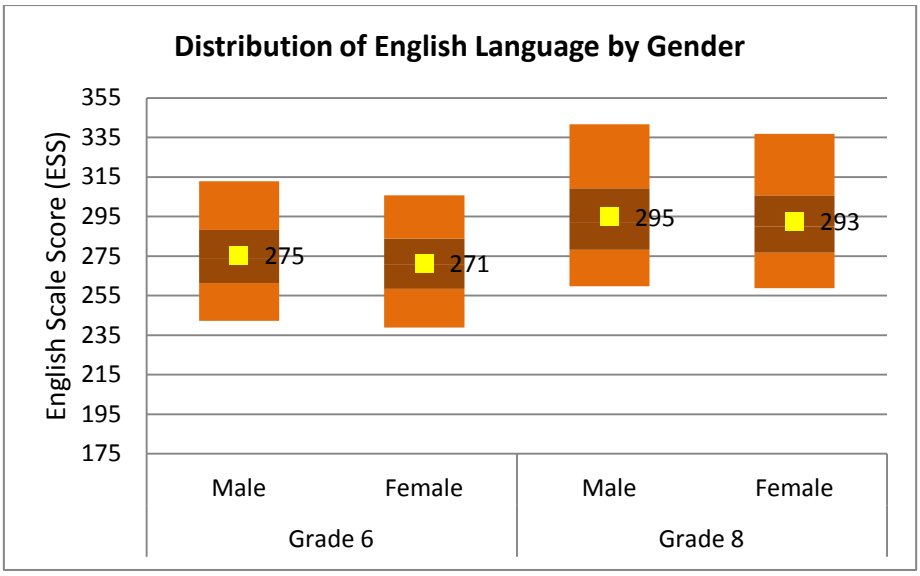
3.4 English language performance by Gender

There was a small difference between boys and girls in Grade 6 and nearly no difference in Grade 8, suggesting gender equity in the Bangladesh education system that appears very hard to achieve in other countries.

Table 24 English language achievement by gender

Gender	Grade 6			Grade 8		
	Number of Students	Mean	Std. Deviation	Number of Students	Mean	Std. Deviation
Male	3580	275.3	21.1	3679	294.9	24.4
Female	3835	271.3	20.4	3507	292.6	23.2
Total	7415	273.2	20.8	7186	293.7	23.8
Effect size		0.2			0.1	

Figure 15 Distribution in English language by Gender



The figure above shows that within the grade boys and girls performed similarly in English language. The low effect size indicates that there is gender equity in English achievement.

3.4.1 Band distribution of English achievement by Gender

Table 25 Band distribution of English language by gender

Grade	Gender	Band 1	Band 2	Band 3	Band 4	Band 5
Grade 6	Male	16%	40%	33%	9%	2%
	Female	20%	43%	30%	6%	1%
Grade 8	Male	3%	20%	41%	23%	12%
	Female	3%	22%	43%	22%	9%

11 per cent and 35 per cent males performed at band 4 and 5 in Grades 6 and 8 respectively. In comparison 7 per cent and 31 per cent females performed at Band 4 and 5 respectively.

3.4.2 Trends in Grade 8 English achievement between years by Gender

Table 26 Trend in English language achievement by gender

Gender	Year 2012			Year 2013			Effect Size
	Number of Students	Mean	Std. Deviation	Number of Students	Mean	Std. Deviation	
Male	4154	300.5	24.7	3679	294.9	24.4	0.23
Female	4124	299.5	25.3	3507	292.6	23.2	0.29
Total	8278	300.0	25.0	7186	293.7	23.8	0.26

3.4.3 Trend in Grade 8 English Band distribution between 2012 and 2013 by Gender

Table 27 Trend in English band distribution over the years by gender

Year	Gender	Band 1	Band 2	Band 3	Band 4	Band 5
Yr2012	Male	3%	15%	33%	32%	17%
Yr2013	Male	3%	20%	41%	23%	12%
Yr2012	Female	3%	18%	33%	29%	18%
Yr2013	Female	3%	22%	43%	22%	9%

The table above depicts that the change in English language achievement is small between 2012 (Grade 9) and 2013 (Grade 8) and it is true for both boys and girls.

Distribution of boys and girls across the bands was very similar in 2012 and 2013 with 17 per cent of boys performed at band 5 in 2012 while 12 per cent in 2013 performed at band 5. However, 18 per cent girls performed at band 5 in 2012 in comparison to 9per cent in 2013.

3.5 English language performance by Examination Board

For both grades, Barisal and Dhaka were the highest performing boards while Sylhet has the lowest mean scale score. The differences between examination boards are medium to large in terms of statistical significance.

Table 28 English language achievement by Examination board

Examination Board	Grade 6			Grade 8		
	Number of Students	Mean	Std. Deviation	Number of Students	Mean	Std. Deviation
Barisal	804	277.3	19.3	768	301.9	25.9
Chittagong	443	270.3	17.4	423	293.2	22.0
Comilla	414	273.7	23.4	411	296.5	26.4
Dhaka	2094	277.5	21.7	2100	298.6	24.9
Jessore	1269	275.3	21.5	1195	292.4	21.0
Rajshahi	976	268.5	17.8	923	288.2	22.1
Rangpur	1032	269.0	19.9	989	288.5	20.6
Sylhet	383	261.1	17.7	377	279.1	18.7
Total	7415	273.2	20.8	7186	293.7	23.8

Figure 16 Grade 6 distribution of English language by Examination board

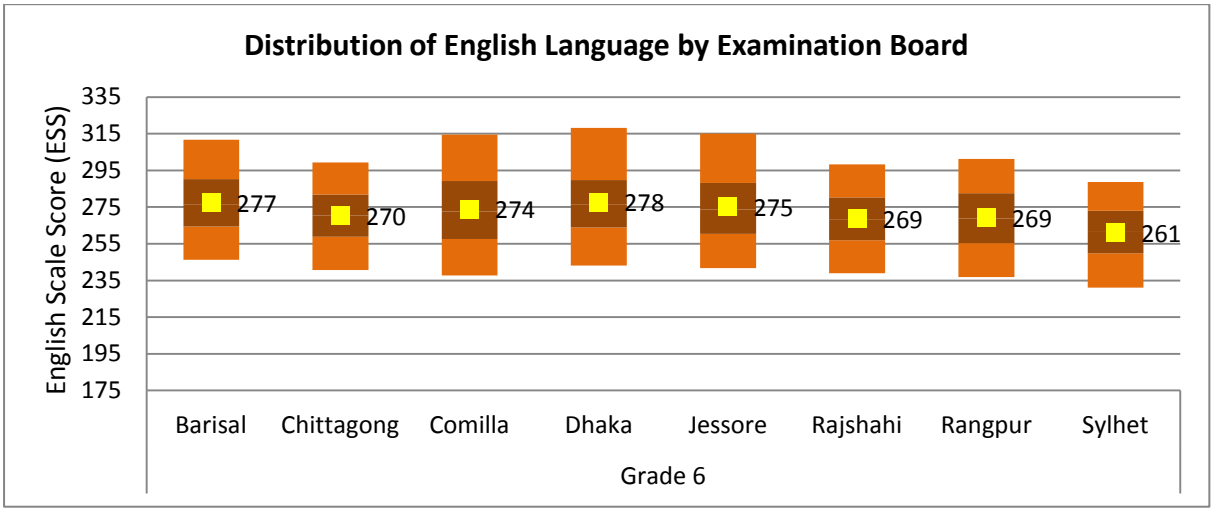
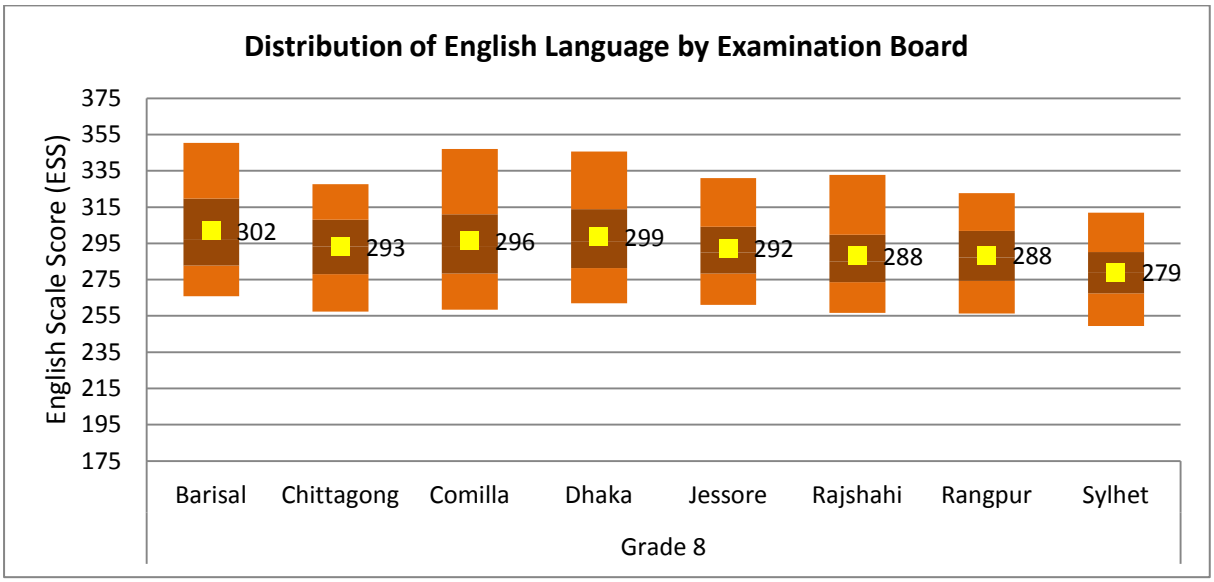


Figure 17 Grade 8 distribution of English language by Examination board



For Grade 6 Chittagong, Rajshahi and Sylhet have the lowest range with Syhlet having 25 per cent of students below 250 which is the lowest among the boards. Comilla has the highest range. Dhaka and Jessore are similar.

For Grade 8 the difference between low achievers and high achievers are relatively high within Comilla examination board and relatively low in Shylhet examination board.

Table 29 Band distribution of English achievement by Examination Board

Grade	Examination Board	Band 1	Band 2	Band 3	Band 4	Band 5
Grade 6	Barisal	12%	40%	36%	12%	1%
	Chittagong	18%	47%	31%	4%	0%
	Comilla	21%	36%	32%	8%	3%
	Dhaka	13%	39%	36%	9%	3%
	Jessore	16%	41%	32%	10%	2%
	Rajshahi	22%	48%	27%	3%	0%
	Rangpur	24%	42%	28%	5%	0%
	Sylhet	36%	45%	18%	1%	
Grade 8	Barisal	1%	15%	39%	24%	21%
	Chittagong	4%	20%	39%	31%	6%
	Comilla	4%	19%	40%	22%	15%
	Dhaka	2%	16%	40%	26%	15%
	Jessore	2%	20%	48%	23%	7%
	Rajshahi	4%	29%	44%	16%	8%
	Rangpur	4%	26%	44%	22%	4%
	Sylhet	8%	38%	43%	10%	1%

At Grade 6, 12 to 13 per cent of students from Barisal and Jessore examination board achieved Band 4 and 5 whilst only 1 to 3 per cent of students from Sylhet and Rajshahi achieved band 4 and 5. In Sylhet examination board, 36 per cent of students scored at band 1.

At Grade 8, 21 per cent of students from Barisal examination board achieved Band 5 and 1 per cent of students from Sylhet achieved Band 5.

3.5.1 Trend in Grade 8 English achievement between years by Examination Board

The difference between boards was significant from medium to low. Range of score differences varied from 3 score points to 12 score points between boards from 2012 to 2013. Minimum difference between 2012 and 2013 in English scale score was observed in Dhaka and Rangpur examination board and maximum difference was observed in Jessore examination board.

Table 30 Trend in English language achievement between years by examination board

Examination Board	Year 2012			Year 2013			Effect Size
	Number of Students	Mean	Std. Deviation	Number of Students	Mean	Std. Deviation	
Barisal	944	308.4	24.0	768	301.9	25.9	0.26
Chittagong	534	299.9	24.7	423	293.2	22.0	0.29
Comilla	522	304.9	24.4	411	296.5	26.4	0.33
Dhaka	2230	301.7	24.5	2100	298.6	24.9	0.12
Jessore	1483	303.6	24.4	1195	292.4	21.0	0.50
Rajshahi	1041	296.3	22.4	923	288.2	22.1	0.36
Rangpur	1122	291.0	25.5	989	288.5	20.6	0.11
Sylhet	402	285.9	24.0	377	279.1	18.7	0.32
Total	8278	300.0	25.0	7186	293.7	23.8	0.26

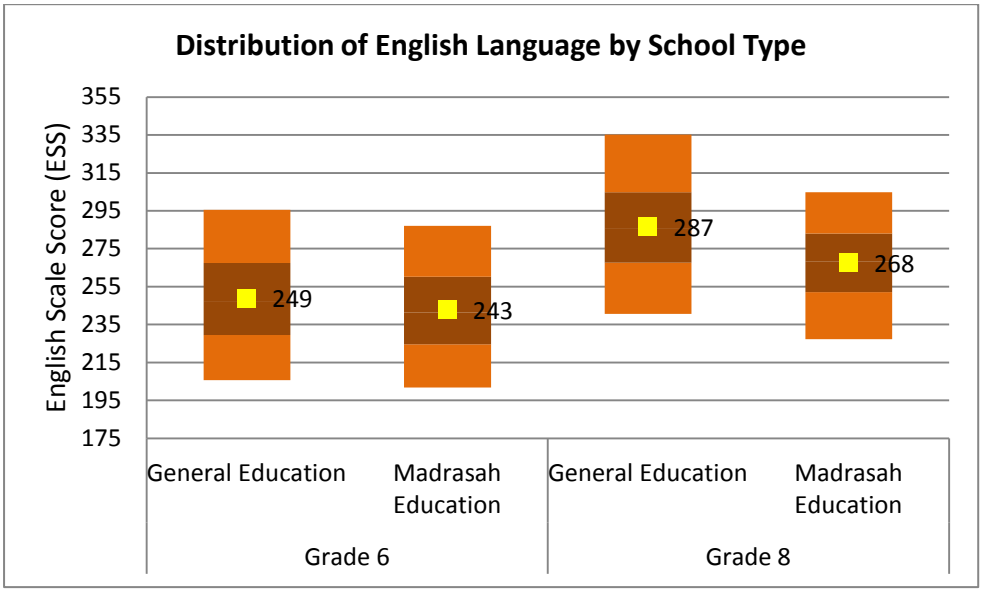
3.6 English language performance by School Type

The mean performance difference in English language was 9 score points between General Education and Madrasah Education for Grade 6. The effect size for Grade 6 indicates that the difference is medium. While the mean performance difference for Grade 8 students between General Education and Madrasah Education was 16 score points. Further, the effect size for Grade 8 indicates that the difference in English language achievement is large between General and Madrasah education.

Table 31 English language achievement by School type

School Type	Grade 6			Grade 8		
	Number of Students	Mean	Std. Deviation	Number of Students	Mean	Std. Deviation
General Education	5788	275.2	20.5	5651	297.1	23.8
Madrasah Education	1627	266.3	20.6	1535	281.4	19.7
Total	7415	273.2	20.8	7186	293.7	23.8
Effect Size		0.4			0.7	

Figure 18 Distribution of English language by school type



The figure above indicates that the difference between high achievers and low achievers are relatively low in Madrasah education as compared to General Education.

3.6.1 Band distribution of English achievement by School type

Table 32 Band distribution in English language by School type

Grade	School Type	Band 1	Band 2	Band 3	Band 4	Band 5
Grade 6	General education	15%	41%	34%	8%	2%
	Madrasah Education	29%	43%	23%	5%	0%
Grade 8	General education	2%	17%	43%	26%	13%
	Madrasah Education	7%	37%	41%	12%	3%

10 per cent of students at Grade 6 and 39 per cent of students at Grade 8 from General Education schools performed at Band 4 and 5 in comparison to 5 per cent of students at Grade 6 and 15 per cent of students at Grade 8 from Madrasah Education schools.

3.6.2 Trend in Grade 8 English achievement between years by School type

Table 33 Trends in English language between 2012 and 2013 by School type

School Type	Year 2012			Year 2013			Effect Size
	Number of Students	Mean	Std. Deviation	Number of Students	Mean	Std. Deviation	
General Education	6494	303.0	24.5	5651	297.1	23.8	0.25
Madrasah Education	1784	289.2	23.9	1535	281.4	19.7	0.36
Total	8278	300.0	25.0	7186	293.7	23.8	0.26

Mean performance of General Education school in 2012 was 4 score points higher than 2013. Mean performance for students from Madrasah schools in 2012 was 7 score points higher than 2013. With the school type, the change in English language achievement between 2012 and 2013 was considered small.

Table 34 Trends in band distribution in English language between years by school type

Year	School Type	Band 1	Band 2	Band 3	Band 4	Band 5
Yr2012	General education	2%	14%	32%	33%	20%
Yr2013	General education	2%	17%	43%	26%	13%
Yr2012	Madrasah Education	6%	27%	37%	22%	8%
Yr2013	Madrasah Education	7%	37%	41%	12%	3%

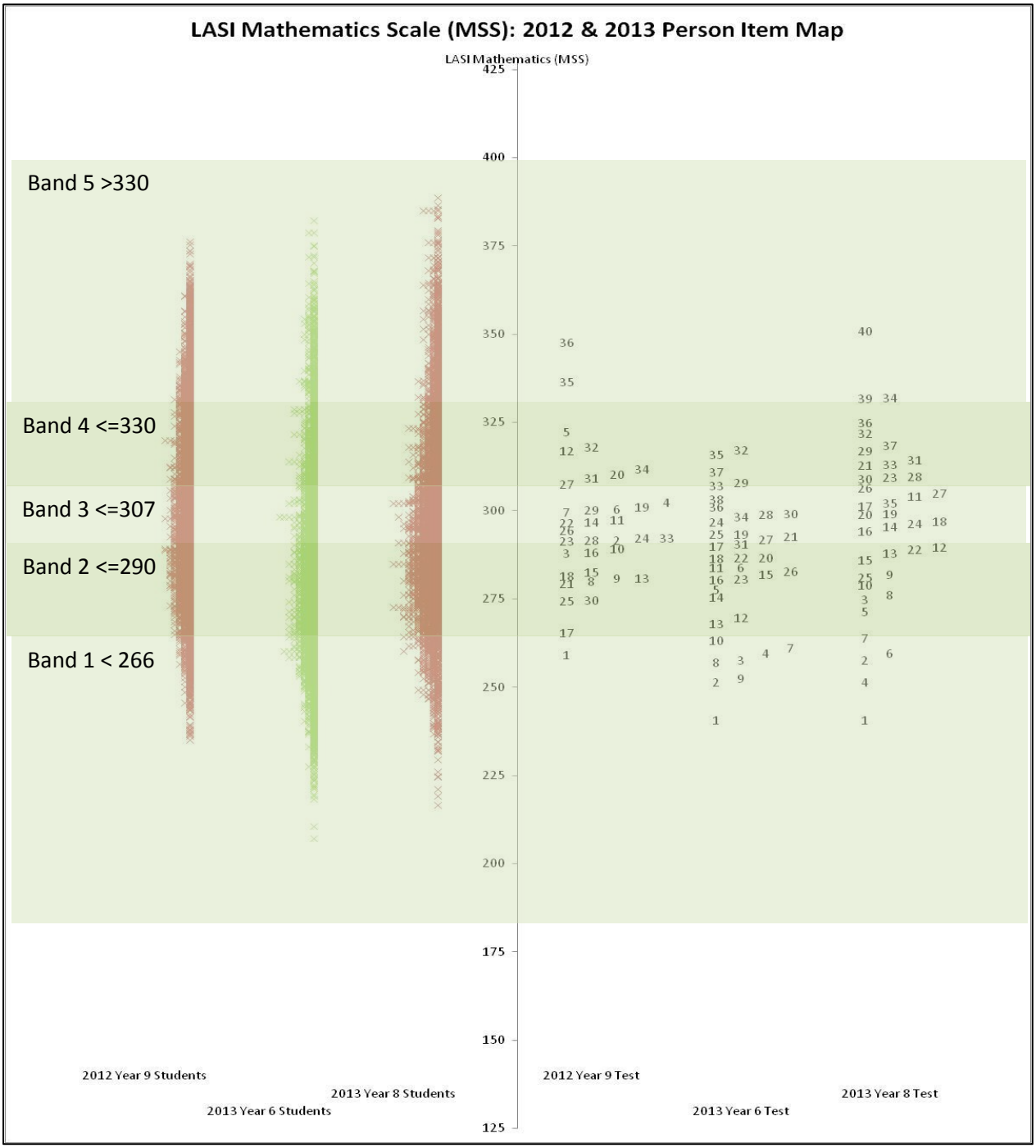
Twenty per cent of students from General Education schools performed at Band 5 in 2012 while 13 per cent of students performed at Band 5 in 2013. However, in Madrasah education 8 per cent of students performed at Band 5 during 2012 but only 3 per cent of students performed at this band in 2013. Two per cent of students performed at Band 1 from General Education schools in both years.

Chapter IV: Mathematics Achievement

Mathematics is considered the foundation stone for higher studies in a number of subjects, especially with context of sciences. Mathematical problem solving skills underpin the capacity to reason logically and can be applied in many every day and academic situations.

4.1 Mathematics Scale Score Map

Figure 19 Mathematics item map



4.2 Analysis of questions by content and cognitive skills

The analysis of questions by content and cognitive domain informs that Mathematics test items had a range of difficulty; items ranged in difficulty from the easiest with a scale score of 199 and 207 to the most difficult with a scale score of 395 and 412 in Grade 6 and Grade 8 respectively. Some knowledge questions were as difficult as understanding and application questions. In Grade 8 Measurement questions seemed particularly difficult. Students in band 1 and 2 are unlikely to have answered the questions correctly. Number questions had a wide range of difficulty, providing an opportunity to the weakest students to answer the easiest questions.

Fig 20 shows the distribution of student achievement, question locations separated by cognitive skills for Grade 6 (left-hand display) and Grade 8 (right-hand display). Figure 21 shows the distribution of student achievement and question locations by content area for Grade 6 (left-hand display) and Grade 8 (right-hand display).

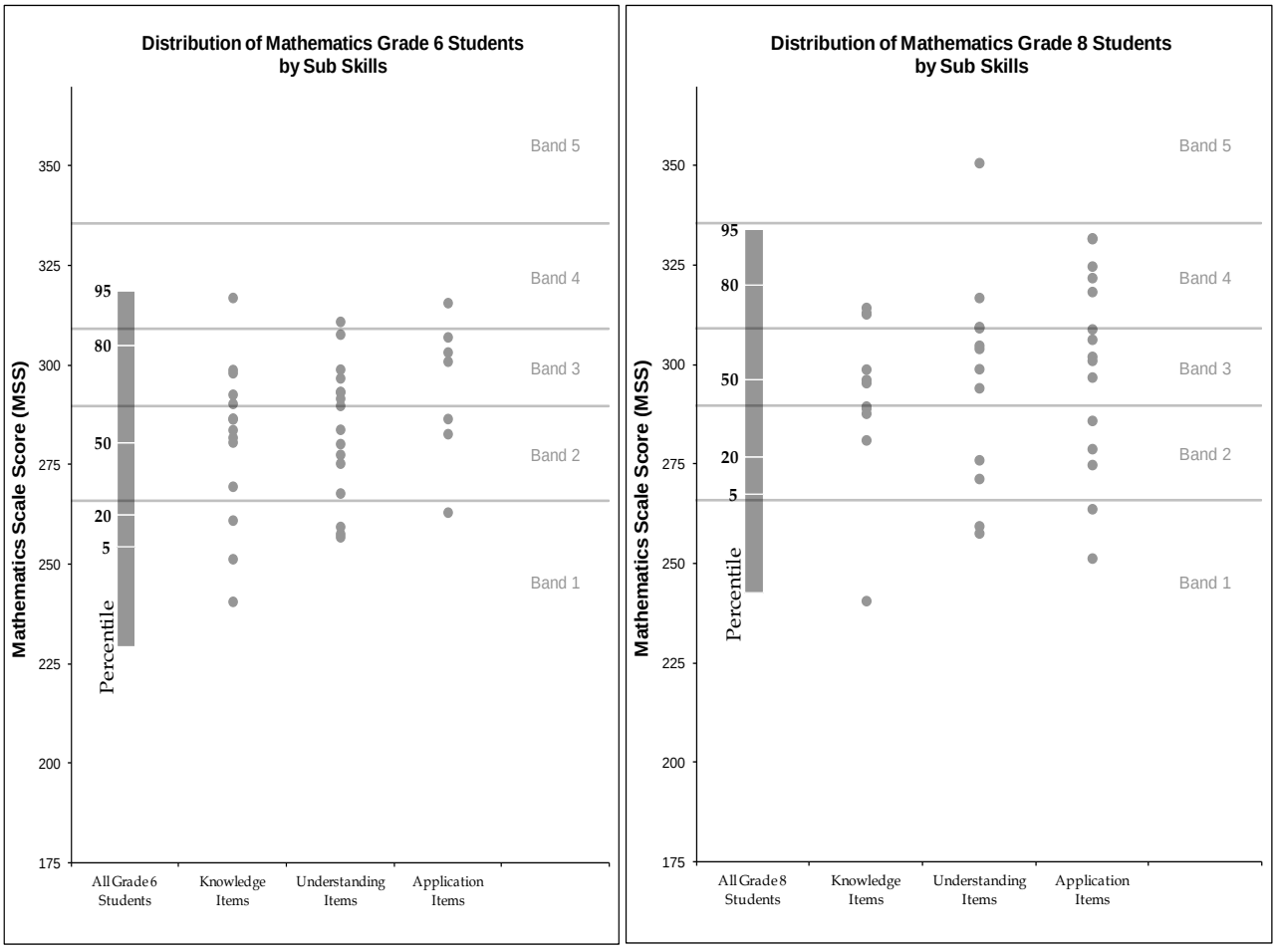


Figure 20 Mathematics achievement and item locations by sub skills

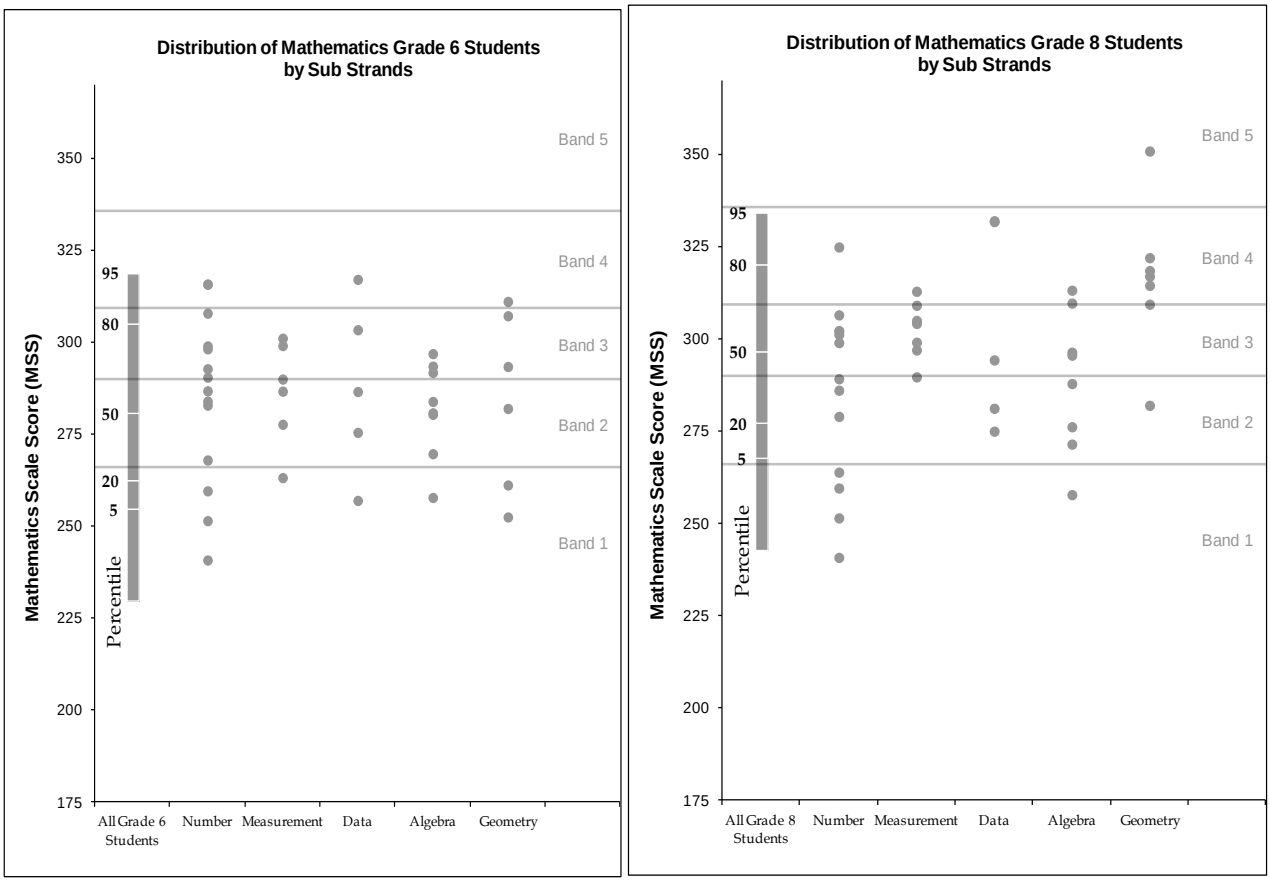


Figure 21 Mathematics achievement and item locations by sub strands

4.3 Benchmarking of Mathematics

In the ensuing sections, what students know and can do in Mathematics is discussed in detail. The mathematics results have been mapped to descriptive bands that align broadly with the curriculum.

Band	Descriptor
Above 330 5	*Students at this level:* reason with geometric figures and facts to solve problems, they solve problems involving proportions and justify their conclusions, they apply algebraic reasoning in situations involving word problems and geometric figures, they model real life situations using algebra and solve problems involving equations, they reason with data in unfamiliar situations.
330 4	*Students at this level:* solve problems involving different types of numbers and operations, they understand laws of exponents, they have procedural knowledge related to conversion between fractions and decimals, they evaluate, factorise algebraic expressions and identify alternate processes or formulas, they use properties of right triangles involving Pythagoras Theorem in simple situations and draw inferences from data.
307 3	*Students at this level:* solve problems involving different types of numbers and operations, convert between fractions, decimals, and percentages, understand fractions, ratios, proportions, and percentages and use them in simple cases, identify whole number exponents, use procedural knowledge related to algebraic expressions, evaluate an algebraic expressions and formulas, simplify an algebraic expression, solve simple linear equations, identify the graphs of linear equations in two variables, recall properties of right triangles involving Pythagoras Theorem, find the perimeter and area of familiar two-dimensional shapes including compound rectilinear shapes, calculate mean and determine median and mode of ungrouped data.
290 2	*Students at this level:* solve problems involving decimals, fractions and integers in a variety of settings, find basic averages, apply unitary method, convert between decimals and fractions, identify ratios, understand simple algebraic expressions, identify like terms, algebraic expression that represents a situation in words, solve simple algebraic equations in one variable, understand properties of familiar two-dimensional shapes, recognise parallel and perpendicular lines, locate points on a coordinate plane and interpret simple data.
266 1	*Students at this level:* handle decimal numbers using routine processes, demonstrate an understanding of whole numbers, solve problems involving division, add, subtract decimal numbers identify algebraic expression that represents a simple situation. visualize three-dimensional shapes, recognise some properties of familiar solids, interpret information in tables to solve simple problems, convert between some familiar units of measurement.

Exhibit 10 Mathematics band descriptors

Table 35 Band distribution of mathematics achievement by grade

Grade	Band 1	Band 2	Band 3	Band 4	Band 5
Grade 6	26%	38%	18%	13%	5%
Grade 8	9%	31%	26%	22%	13%

A small percentage (5 per cent) Grade 6 and (13 per cent) Grade 8 students demonstrated Band 5 skills. Students in this band are likely to solve proportion, problems and justify their conclusions. They write algebraic expressions that model situations in word problems and geometric figures. They are able to solve problems involving equations and formulas. They can write an equation to model a situation and solve it. They reason with geometric figures to solve problems involving the sum of angles in a triangle, linear pairs and quadrilaterals

and interior and exterior angles. Students reason with data in unfamiliar situations to solve multi-step problems.

Thirteen per cent Grade 6 and 22 per cent Grade 8 students demonstrated Band 4 skills. Students in this band are likely to solve problems involving different types of numbers and operations. They solve problems involving fractions, ratios, proportions, and percentages in profit and loss, simple interest. They show an understanding of laws of whole number exponents. At this level, they show procedural knowledge related to conversion between fractions and recurring decimals. They evaluate, factorise algebraic expressions and identify alternate processes or formulas. They use properties of right triangles involving Pythagoras Theorem in simple situations and draw inferences from data.

About a fifth (18per cent) Grade 6 and around 26 per cent of Grade 8 students showed Band 3 skills. Students in this band are likely to solve problems involving different types of numbers and operations. Students convert between fractions, decimals, and percents to each other. They solve problems involving fractions, ratios, proportions, and percentages. They show understanding of whole number exponents. At this level students show procedural knowledge related to algebraic expressions. They evaluate a variety of expressions and formulas. They simplify an algebraic expression by combining like terms and identify equivalent expressions, solve simple linear equations involving negative integers. They identify the graphs of linear equations in two variables. They recall properties of right triangles involving Pythagoras Theorem. They find the perimeter and area of familiar two-dimensional shapes including complex rectilinear shapes. They calculate means and determine median and mode from a data presented in tables.

Over a third (38 per cent) of Grade 6 and 31 per cent of Grade 8 students demonstrated Band 2 skills. Students in this band are likely to solve problems involving decimals, fractions and integers in a variety of settings. For example, they calculate unit prices to solve a problem, find averages, use unitary method, convert between decimals and fractions, and identify ratios. Students at this level understand simple algebraic expressions. For example, they identify like terms, they identify an algebraic expression that represents a situation in words, they recognise equivalent expressions. They solve simple algebraic equations in one variable and have a basic understanding of exponents. They understand the properties of familiar two-dimensional shapes and recognise parallel and perpendicular lines and locate points on a coordinate plane and interpret data presented in tables and by graphs.

Nearly a quarter (26 per cent) Grade 6 and (9 per cent) Grade 8 students demonstrated Band 1 skills. Students in this band are likely to carry out routine single stage problems. They handle decimal numbers using algorithmic processes and demonstrate an understanding of whole numbers. For example, they find multiples and prime factors of whole numbers, solve problems involving division to find averages. They add, subtract decimal numbers. They identify algebraic expression that represents a situation. They visualize three-dimensional

shapes including recognizing some properties of familiar solids. They interpret information in tables to solve simple problems and convert between some familiar units of measurement.

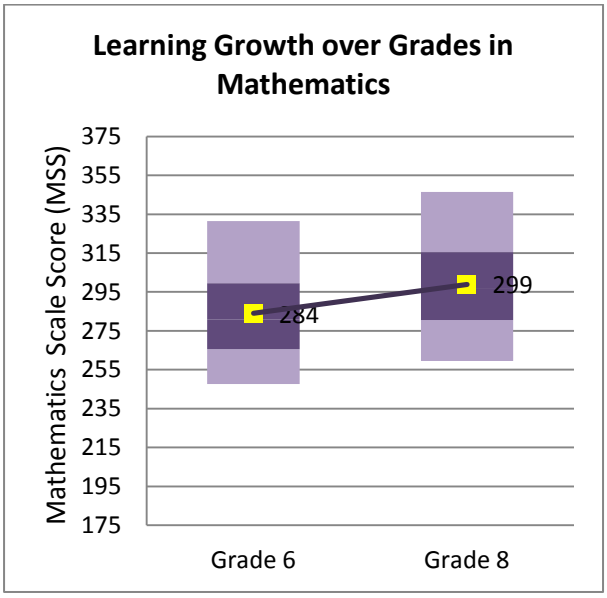
4.4 Mathematics achievement by Grade

Table 36 Mathematics performance by grade

Grade	Number of Students	Mean	Std. Deviation	Minimum	Maximum	Effect Size
Grade 6	7153	284.0	25.4	203.7	387.7	0.6
Grade 8	7185	298.9	26.0	216.5	402.4	

For mathematics, the average MSS in LASI 2013 is 284 (band 2) for Grade 6 and 298 (band 3) for Grade 8. The difference is of 14 scale score points with an effect size of 0.6 which is considered moderately significant. This indicates a moderate learning progression in mathematics between grades.

Figure 22 Learning growth in mathematics over the grades



4.4.1 Trends in Grade 8 Mathematics achievement between years

Table 37 Trend in mathematics achievement over the years

Year	Number of Students	Mean	Std. Deviation	Effect Size
Yr 2012	8278	300.0	25.0	0.04
Yr 2013	7185	298.9	26.0	

Table 38 Trend in mathematics band distribution between years

Year	Band 1	Band 2	Band 3	Band 4	Band 5
Yr2012	7%	32%	24%	23%	14%
Yr2013	9%	31%	26%	22%	13%

Mean performance of 2012 and 2013 is similar. The effect size of 0.04 reveals that there is no difference in mathematics performance between these two years. Variation in per cent of student achievement is small and not significant.

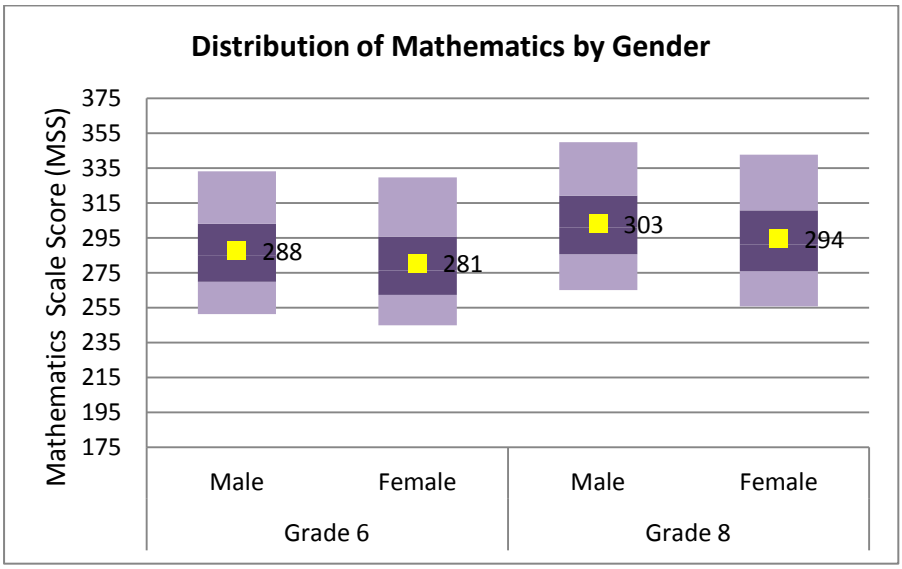
4.5 Mathematics achievement by Gender

In mathematics there was a small difference between boys and girls in both grades, favouring boys. The difference is small and is likely to have very little practical significance and it is consistent for both the grades

Table 39 Mathematics performance by Gender

Gender	Grade 6			Grade 8		
	Number of Students	Mean	Std. Deviation	Number of Students	Mean	Std. Deviation
Male	3464	287.6	24.6	3668	303.3	25.2
Female	3689	280.5	25.7	3517	294.4	26.1
Total	7153	284.0	25.4	7185	298.9	26.0
Effect size		0.3			0.3	

Figure 23 Distribution in mathematics performance by gender



The figure above depicts that boys are slightly performing better than their girl counterpart. But the difference between the low achievers and high achievers within the group is similar.

4.5.1 Band distribution of Mathematics achievement by Gender

Table 40 Band distribution in mathematics by gender

Grade	Gender	Band 1	Band 2	Band 3	Band 4	Band 5
Grade 6	Male	19%	39%	21%	15%	6%
	Female	32%	37%	15%	11%	5%
Grade 8	Male	5%	26%	28%	26%	15%
	Female	12%	36%	23%	19%	10%

Six per cent of Grade 6 and 15 per cent of Grade 8 boys performed at Band 5 while 5 per cent of Grade 6 and 10 per cent of Grade 8 girls performed at Band 5. A high percentage, 19 and 32 per cent of boys and girls respectively, performed at Band 1 in Grade 6.

4.5.2 Trend in Grade 8 Mathematics achievement between years by Gender

Table 41 Trend in mathematics a achievement between years

Gender	Year 2012			Year 2013			Effect Size
	Number of Students	Mean	Std. Deviation	Number of Students	Mean	Std. Deviation	
Male	4154	302.9	24.1	3668	303.3	25.2	0.01
Female	4124	297.1	25.5	3517	294.4	26.1	0.11
Total	8278	300.0	25.0	7185	298.9	26.0	0.04

Table 42 Trend in mathematics band distribution between years by Gender

Year	Gender	Band 1	Band 2	Band 3	Band 4	Band 5
Yr2012	Male	5%	28%	26%	25%	16%
Yr 2013	Male	5%	26%	28%	26%	15%
Yr 2012	Female	10%	35%	22%	21%	13%
Yr 2013	Female	12%	36%	23%	19%	10%

Between 2012 and 2013, there is no change in mathematics performance is observed for boys and a small change in mathematics performance is observed for girls.

The distribution of both boys and girls are similar during 2012 and 2013.

4.6 Mathematics performance by Examination Board

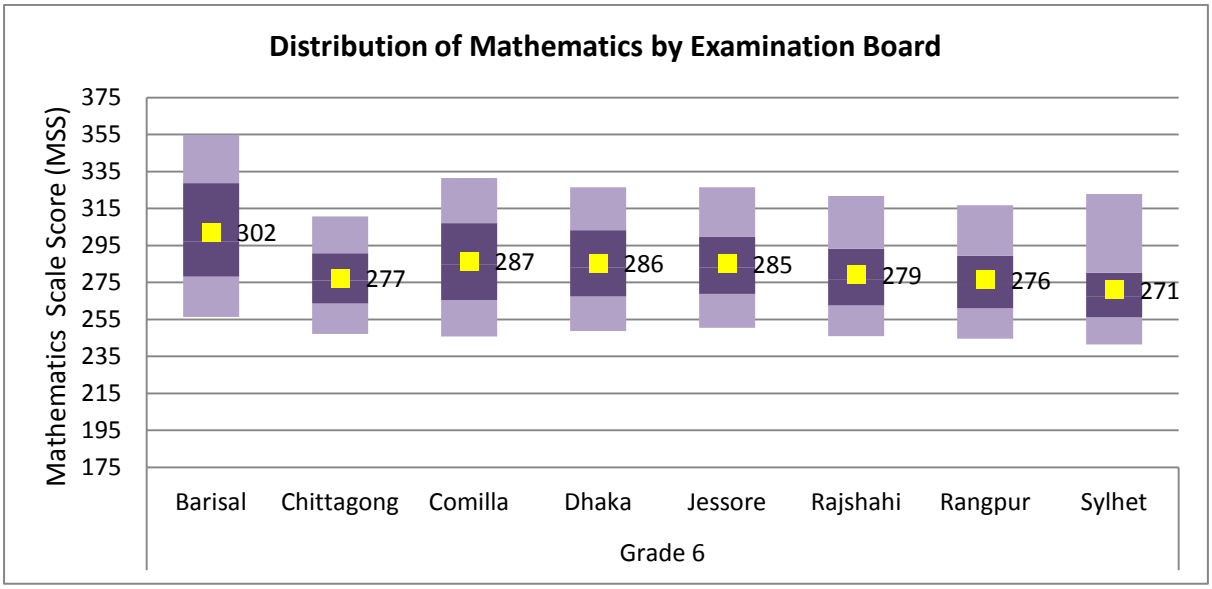
Table 43 Mathematics achievement by Examination board

Examination Board	Grade 6			Grade 8		
	Number of Students	Mean	Std. Deviation	Number of Students	Mean	Std. Deviation
Barisal	775	302.2	31.3	767	314.0	27.6
Chittagong	443	277.4	19.8	427	290.9	23.0
Comilla	390	286.6	26.6	417	300.1	25.5
Dhaka	1985	285.5	23.9	2084	303.3	26.7
Jessore	1245	285.2	23.6	1197	296.0	24.4
Rajshahi	958	279.1	22.7	927	294.3	25.5
Rangpur	1004	276.4	22.3	991	293.0	21.6
Sylhet	353	271.0	23.0	375	287.5	21.1
Total	7153	284.0	25.4	7185	298.9	26.0

Performance of Barisal students was considerably higher than students from other examination boards at Grade 6. The mean scale score for Barisal was 16 to 31 scale score points higher than other Examination Board. Dhaka and Khulna students had mean scale scores of 285 while Sylhet had the lowest mean scale score (271).

The pattern of achievement was reflected in the Grade 8 data; Barisal was the highest in mathematics (314), Dhaka was the second best while Sylhet had the lowest average mean scale score (287). The difference between other boards is considered small to moderate in terms of statistical significance.

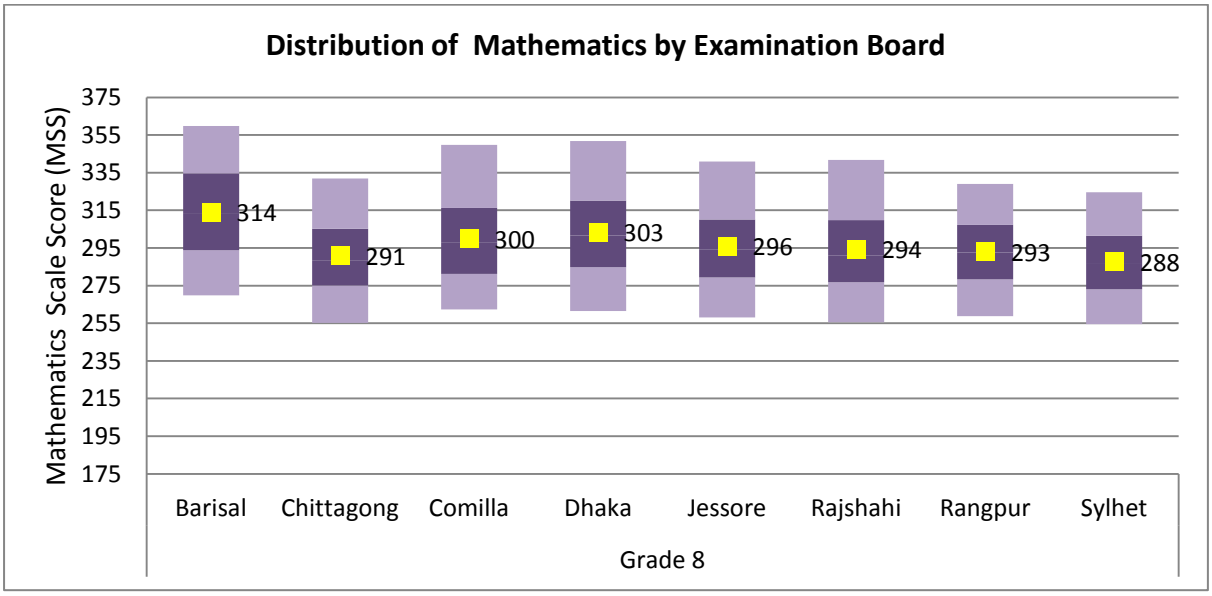
Figure 24 Grade 6 distribution of mathematics achievement by examination board



The distribution of students in Chittagong has the lowest range while Barisal has the highest range compared to other boards. The spread between 75th percentile and 95th percentile for

Syhlet is very high as compared to others. In Shylhet examination board 25 per cent students scored at or less than 255 score points however in Barisal just 5 per cent students score at or less than 255 score point.

Figure 25 Grade 8 distribution of mathematics achievement by examination board



Rangpur and Shylet have the lowest range of distribution while Dhaka has the highest range of distribution in Grade 8. In Chittagong, Rajshahi and Sylhet examination board near 25 per cent students scored at or less than 275 scale score point however, in Barisal examination board just little over 5 per cent students score at or less than 275 score point.

4.6.1 Band distribution of Mathematics achievement by Examination Board

Table 44 Band distribution of mathematics by Examination board

Grade	Examination Board	Band 1	Band 2	Band 3	Band 4	Band 5
Grade 6	Barisal	12%	31%	16%	17%	24%
	Chittagong	31%	43%	20%	5%	1%
	Comilla	26%	30%	19%	20%	5%
	Dhaka	22%	36%	21%	17%	3%
	Jessore	20%	42%	20%	13%	4%
	Rajshahi	31%	40%	17%	10%	2%
	Rangpur	35%	41%	16%	6%	3%
	Sylhet	47%	38%	7%	5%	3%
Grade 8	Barisal	3%	18%	21%	27%	31%
	Chittagong	12%	42%	23%	17%	6%
	Comilla	7%	32%	24%	26%	11%
	Dhaka	7%	26%	25%	26%	16%
	Jessore	9%	33%	28%	21%	8%
	Rajshahi	12%	36%	25%	17%	11%
	Rangpur	10%	35%	30%	21%	5%
	Sylhet	15%	42%	24%	16%	3%

Forty one per cent of students from Barisal board achieved at Band 4 and 5 in Grade 6 compared with 8 per cent and 9 per cent from Syhlet and Rangpur respectively. Syhlet and Rangpur have the highest percentage of students performing at Band 1 in Grade 6.

In Grade 8 more than half (58 per cent) of the students of the Barisal board performed at Band 4 and 5. Syhlet had the highest percentage (15 per cent) of students performing at Band 1 and only 19 percent of its students performed at Band 4 and 5

4.6.2 Trend in Grade 8 Mathematics achievement between years by Examination Board

Table 45 Trend in mathematics achievement by Examination board between years

Examination Board	Year 2012			Year 2013			Effect size
	Number of Students	Mean	Std. Deviation	Number of Students	Mean	Std. Deviation	
Barisal	944	314.9	27.2	767	314.0	27.6	0.03
Chittagong	534	295.0	21.0	427	290.9	23.0	0.19
Comilla	522	300.4	22.3	417	300.1	25.5	0.01
Dhaka	2230	302.4	25.3	2084	303.3	26.7	0.04
Jessore	1483	301.6	24.8	1197	296.0	24.4	0.23
Rajshahi	1041	296.2	22.1	927	294.3	25.5	0.08
Rangpur	1122	291.6	21.3	991	293.0	21.6	0.07
Sylhet	402	284.8	22.5	375	287.5	21.1	0.13
Total	8278	300.0	25.0	7185	298.9	26.0	0.04

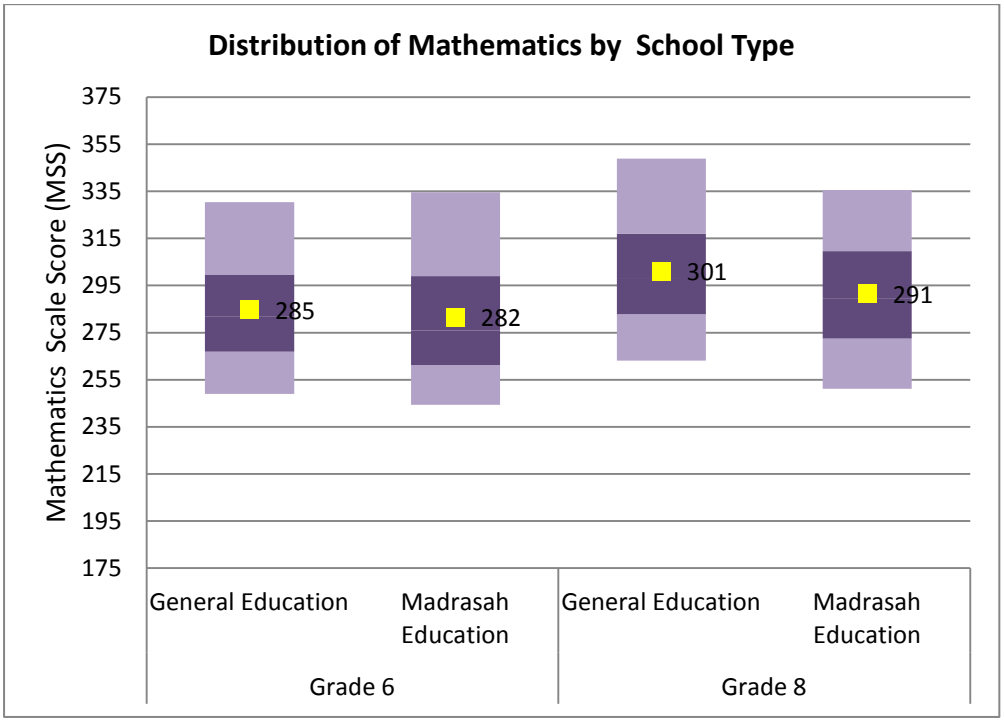
Performance trends between boards between years are nearly same in mathematics with a very small effect size. The change is highest in Jessore and lowest in Barisal and Dhaka examination board.

4.7 Mathematics performance by School type

Table 46 Mathematics achievement by School type

School Type	Grade 6			Grade 8		
	Number of Students	Mean	Std. Deviation	Number of Students	Mean	Std. Deviation
General Education	5605	284.6	24.7	5639	301.0	25.7
Madrasah Education	1548	281.5	27.9	1546	291.4	25.8
Total	7153	284.0	25.4	7185	298.9	26.0
Effect Size		0.1			0.4	

Figure 26 Distribution in mathematics achievement by school type



There was a difference of 9 scale score points between General Education and Madrasah Education at Grade 8 which is moderately significant while there was a small difference of 3 scale score points between the two school groups at Grade 6.

The above figure depicts that in grade 6 the difference between low performers and high performers are relatively higher for Madrasha education as compared to general education. In Grade 8 though students from Madrasah education performed lower than General education, the difference between low performers and high performers is more or less same.

4.7.1 Band distribution of Mathematics achievement by School type

Table 47 Band distribution of mathematics achievement by school type

Grade	School Type	Band 1	Band 2	Band 3	Band 4	Band 5
Grade 6	General education	23%	39%	19%	13%	5%
	Madrasah Education	34%	33%	14%	13%	7%
Grade 8	General education	7%	30%	27%	23%	14%
	Madrasah Education	16%	34%	22%	19%	8%

Eighteen per cent of students performed at Band 4 and 5 from General Education schools at Grade 6 while 20 per cent of Madrasah school students performed at Band 4 and 5.

Thirty seven per cent of students of Grade 8 from General Education schools performed at Band 4 and 5 in comparison to 23 per cent of students from Madrasah schools. 16 per cent of Madrasah education school students performed at Band 1 in comparison only 7 per cent of students from General Education schools performed at Band 1.

4.7.2 Trend in Grade 8 Mathematics achievement between years by School type

Table 48 Trend in mathematics achievement by school type

School Type	Year 2012			Year 2013			Effect Size
	Number of Students	Mean	Std. Deviation	Number of Students	Mean	Std. Deviation	
General Education	6494	302.1	24.6	5639	301.0	25.7	0.05
Madrasah Education	1784	292.4	25.0	1546	291.4	25.8	0.04
Total	8278	300.0	25.0	7185	298.9	26.0	0.04

Table 49 Trend in mathematics band distribution between 2012 and 2013

Year	School Type	Band 1	Band 2	Band 3	Band 4	Band 5
Yr2012	General education	6%	29%	25%	25%	15%
Yr2013	General education	7%	30%	27%	23%	14%
Yr2012	Madrasah Education	12%	42%	20%	15%	11%
Yr2013	Madrasah Education	16%	34%	22%	19%	8%

The mean performance between years for both General and Madrasah education was more or less same. Within the General education the band distribution across the different level is similar but in Madrasah education performance was slightly better during 2012 as compared to 2013.

Chapter V Other Findings and Factors Impacting Learning Outcomes

5.1 Student Performance in Bangla, English and Mathematics between Schools

Large variation between schools is detrimental to achieving equity and reflects variations in quality in education. LASI 2013 has large to moderate between school variation and large to small in school variation.

Table 50 Within and between school variation of learning achievement in three subjects

Subjects	Grade 6		Grade 8	
	Between School Variance	Within School Variance	Between School Variance	Within School Variance
Bangla	39%	61%	48%	52%
English	58%	42%	70%	30%
Mathematics	72%	28%	76%	24%

For Bangla, 39 per cent of the variation was between schools while within school variation was large at 61 per cent for Grade 6. While at Grade 8 the variation between schools and within school was very similar, 48 per cent and 52 percent respectively.

For English, at Grade 6, the between school variation was 58 percent and within school variation was 42 per cent while at Grade 8, the between school variation was high at 70 per cent and within school variation was 30 per cent.

For Mathematics, at Grade 6 and Grade 8, the between school variation was 72 per cent and 76 per cent respectively while the within school variation was 28 per cent and 24 per cent respectively.

5.2 Bangla between School variation

Figure 27 Variation in Bangla learning achievement in Grade 6

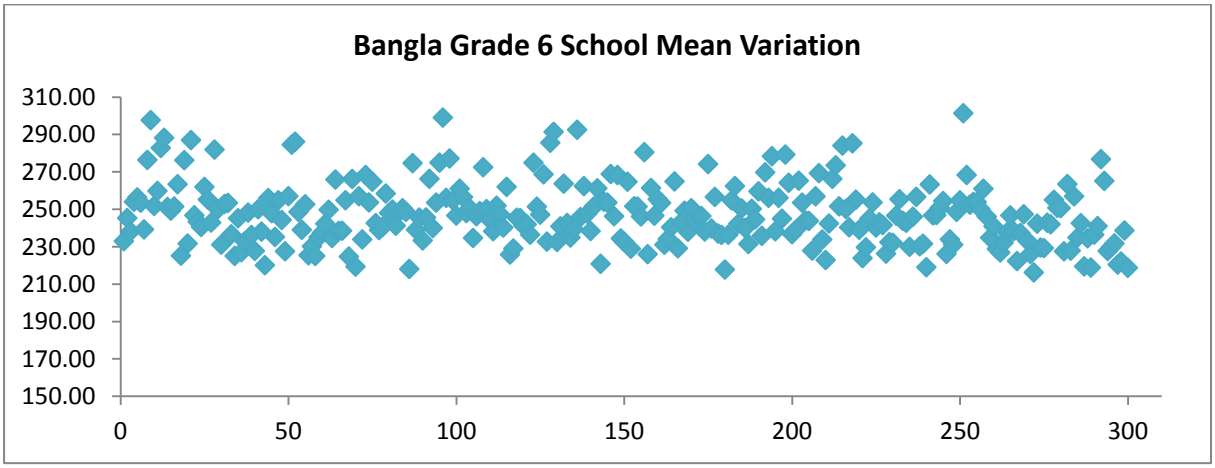
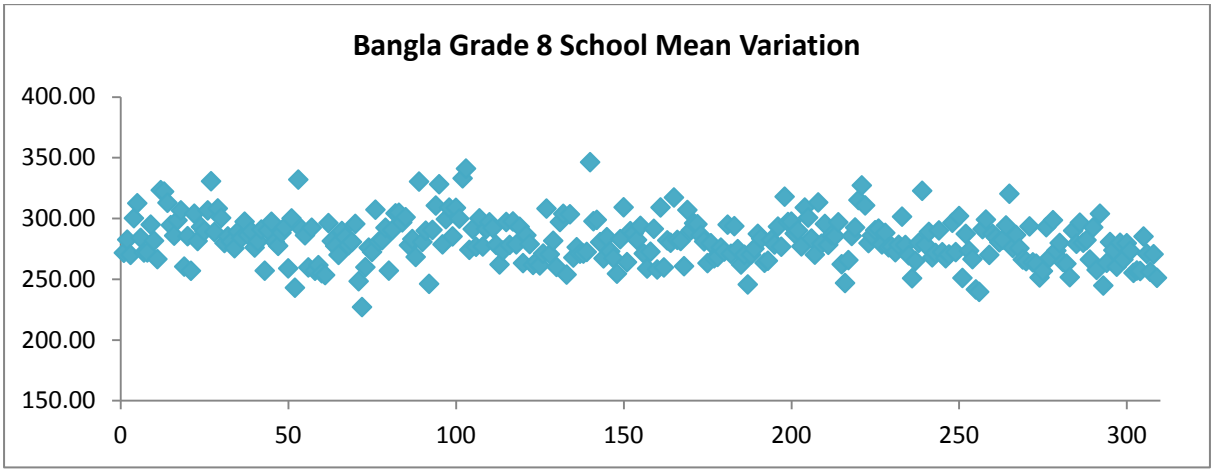


Figure 28 Variation in Bangla learning achievement in Grade 7



Figures 27 and 28 depict that mean Bangla performance of some schools was high (295 at Grade 6 and 350 at Grade 8) and some performed very low, 210 at Grade 6 and 225 at Grade 8. There is a difference of nearly 100 score points on the BSS between the means of the highest and the lowest achieving schools. The mean of highest performing school at Grade 6 is at Band 4 while the lowest performing school are at Band 1. The mean of the highest performing school at Grade 8 is at Band 5 while the lowest are at Band 2.

5.3 English between School variation

Figure 29 Variation in English learning achievement in Grade 6

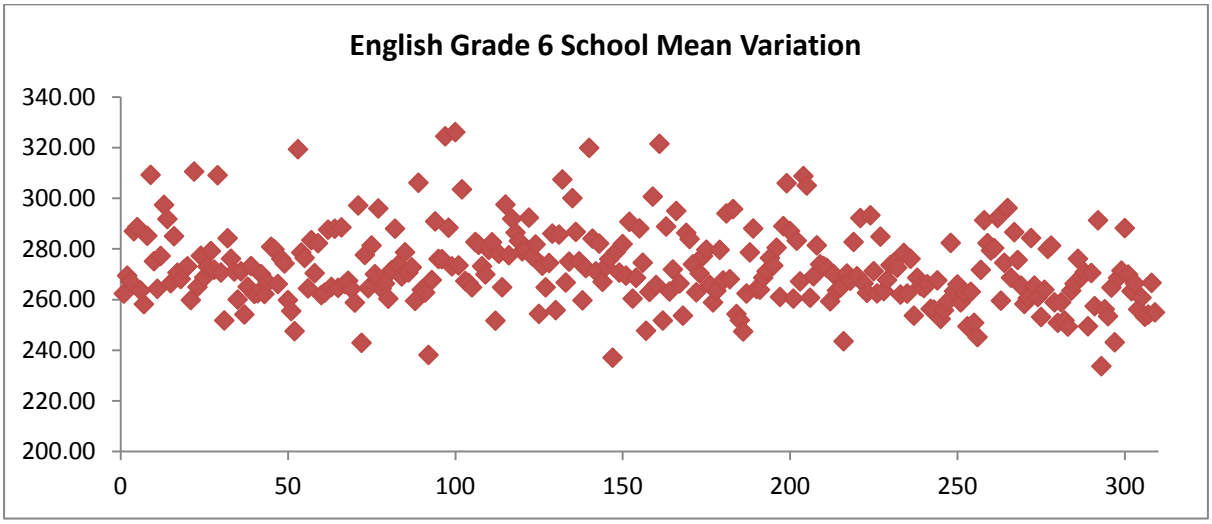


Figure 30 Variation in English learning achievement in Grade 8

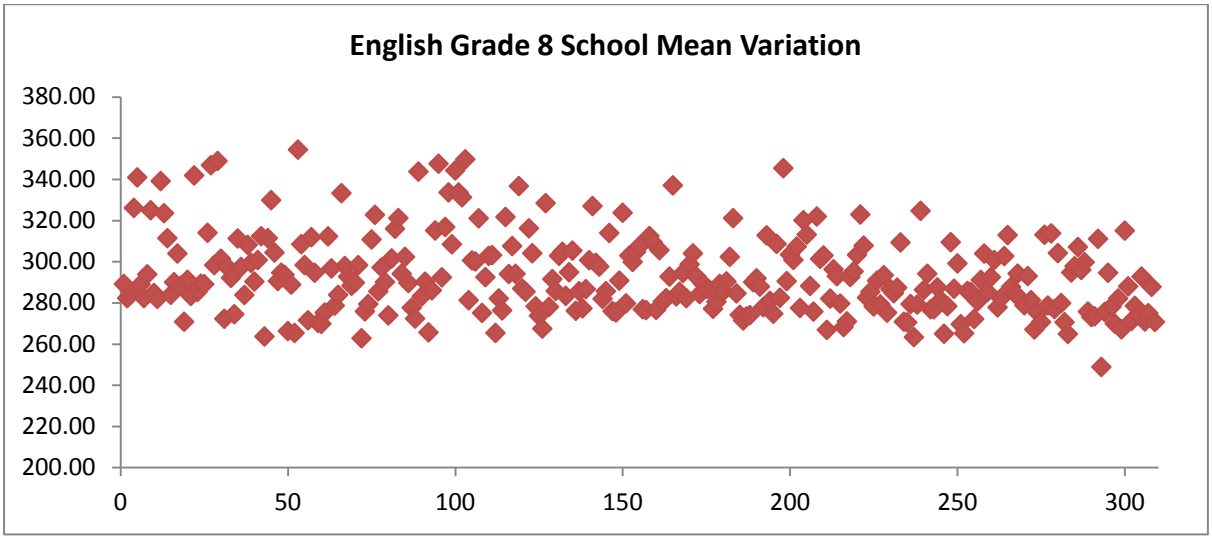


Figure 29 and 30 depict that English mean performance variations between schools and within schools. The lowest performing school's mean was around 230 while the highest performing schools had a mean of 325 for Grade 6. At Grade 8, lowest performing schools had a mean of 260 and high performing schools had 345. The high performing schools for Grade 6 are at Band 4 and the low performing are at Band 1. The high performing schools for Grade 8 are at Band 5 and low performing schools are at Band 2.

5.4 Mathematics between School variation

Figure 31 Variation in mathematics learning achievement in Grade 6

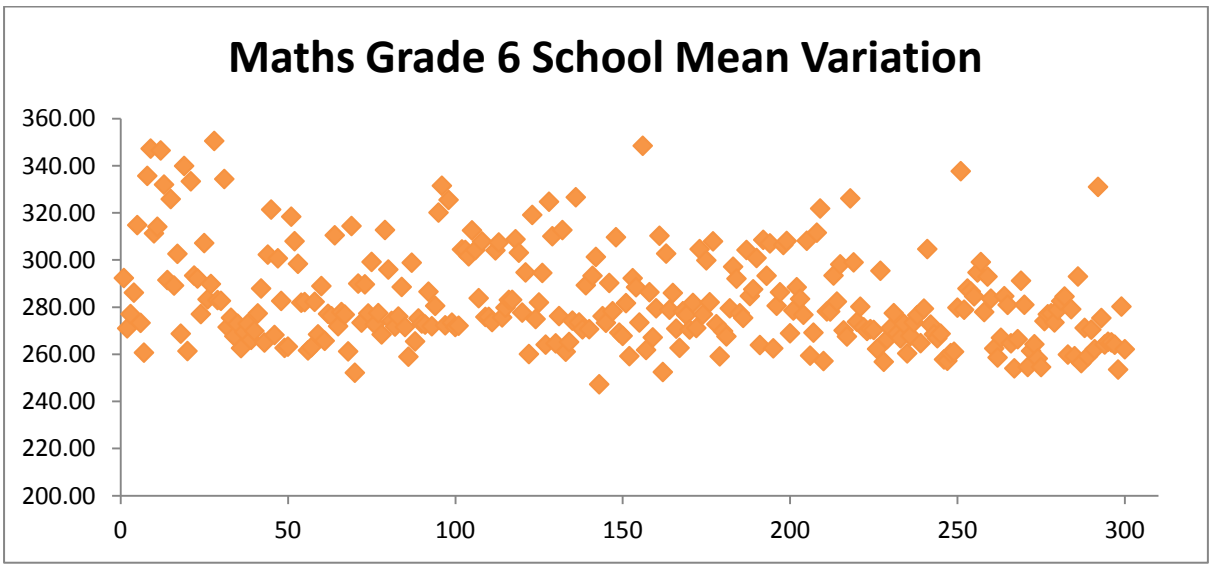


Figure 32 Variation in mathematics learning achievement in Grade 8

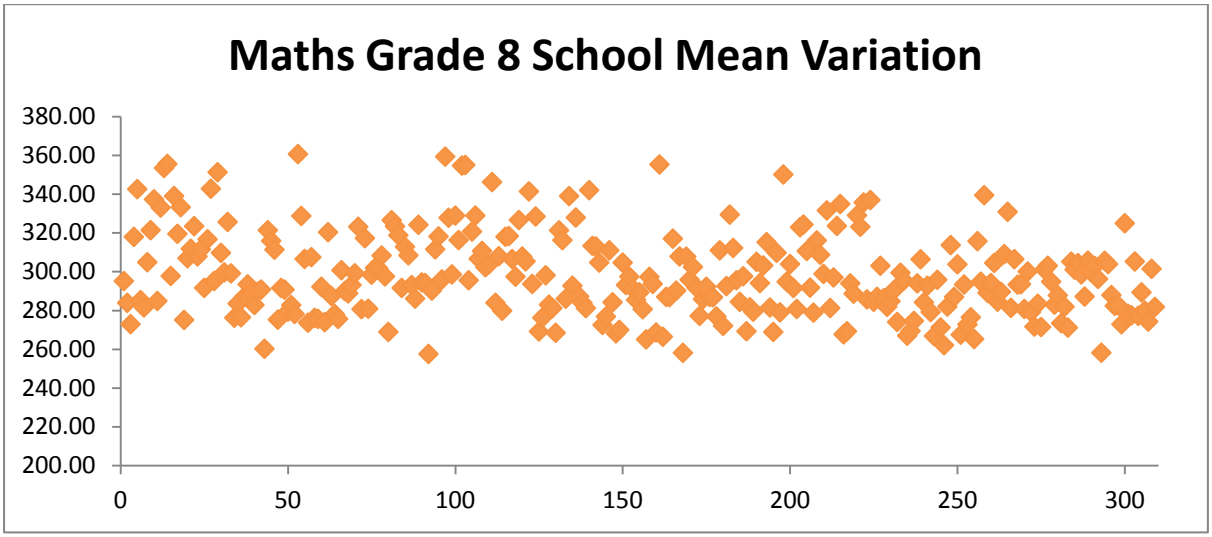


Figure 31 and 32 shows that the highest performing school's mean is around 350 while low performing school's mean is around 250 at Grade 6. At Grade 8 the difference is around 100 MSS, the mean of high performing school is around 360 and low performing schools is at 260. Schools achieved at Band 1 and Band 5 in both grades.

5.4 Result of background variables

The background variables include the institutional and demographic background. School environment and conditions of learning were clubbed and taken into account for analysis. In recent years school climate has gained increased attention of researchers. Many are convinced that the school climate has a direct impact on the attitudes and behaviour of the students. For this report school environment includes instructional practices, peer perception, detention, SEQAEP intervention, PMT Stipend, bullying and head teacher's perception of teacher efficiency and school resources. Demographic factors are student's tribal background, and father's education. Appendix I provide the table of composite index used for this analysis.

Results of a multilevel model analysis for each of the three subjects are presented and discussed. It examines simultaneously the relationships of the student and teacher level variables on the respective subject.

One of the first results of interest that emerge from the analysis is information regarding the variance associated with the levels in the analysis. Table 50 presents results of the estimation of variance components (for an explanation of how these were calculated see Raudenbush & Bryk, 2002) that are required to calculate the variance (a) associated with the between-student level and the between-teachers levels respectively and (b) accounted for at each level by the final model.

5.4.1 Teacher Variance Analysis

Table 50 Between Student and Between Teacher Variance

	Variance associated with		Variance accounted for by final model between	
Subjects	**Teachers***	**Students**	**Teachers***	**Students**
Bangla	78%	22%	12%	9%
English	63%	37%	5%	8%
Mathematics	48%	52%	9%	9%

*In the two level HLM analyses, the average of teacher responses within a school were used at the teacher level (level-2). The 309 units at level 2 consisted of the averages for two schools with 1 teacher response, 10 schools with 2 teacher responses, 110 with 3 teacher responses, 70 schools with 4 teacher responses, 111 schools with 5 teacher responses, 6 schools with 6 teacher responses.

As can be seen in Table 50, the variance components differ quite considerably for the three subjects. For Bangla, a bit over three quarters (78%) of the total variance in achievement is associated with the student level while 22 per cent are associated with the teacher level. In contrast, in mathematics, the apportioning of the variance between the two levels is nearly even: Slightly more than half of the variance is associated with students (52%) while slightly less than half of the variance (48%) is associated with teachers. Put differently, the differences in mathematics performance is related much less to differences between students within schools and much more to differences between teachers across schools when compared to performance differences in Bangla.

Table 51 provides a summary of the effects that emerge from the HLM analyses of the final model for each outcome. At level 1, instructional strategies, uncooperative peers, father's education and whether or not students belong to a tribe have significant effects on achievement. Thus, students who report greater levels of being hit or threatened by other students, disruptive behaviour of other students in class and other students spreading rumours about them perform at a lower level in Bangla, English and Mathematics. In addition, students who report that their teachers make the classes and learning interesting, explain things clearly and want to help students to learn perform at a higher level than their peers in Bangla, English and Mathematics.

5.4.2 Teacher and Student Factors link with Learning outcome

Table 51 Factors associated with learning outcomes

	Subjects		
	Bangla	**English**	**Mathematics**
Level-2, Teachers			
Teaching experience (TCHEXP; n of years)	Ns	ns	✓
Teacher educational level (TCHQUAL; 0-HSC or Graduate; 1-Masters)	Ns	✓	ns
Bachelor of Education (BED; 0-no; 1-yes)	✓	✓	ns
Level-1, Students			
Instructional strategies (INSTRAT)	✓	✓	✓
Uncooperative peers (UNCPEER)	✓ (-)	✓ (-)	✓ (-)
Academic self concept (SELCONC)	ns	ns	ns
House type (HOUSETYP; 0-Katcha; 1-(semi-)pucca)	ns	ns	ns
Father's education (FED; 0-Illiterate/compl. prim; 1-secondary or above)	✓	✓	✓
Gender (GENDERR; 0-female; 1-male)	ns	✓	✓
Belonging to a tribe (TRIBAL; 0-no; 1-yes)	✓ (-)	✓ (-)	✓ (-)

Notes:

✓ Significant positive effect on outcome. For coding see notes in brackets.

✓ (-) Significant negative effect on outcome. For coding see notes in brackets.

ns Effect not significant.

Figure 33 Grade 6 Students' Indigenous background and Learning outcomes

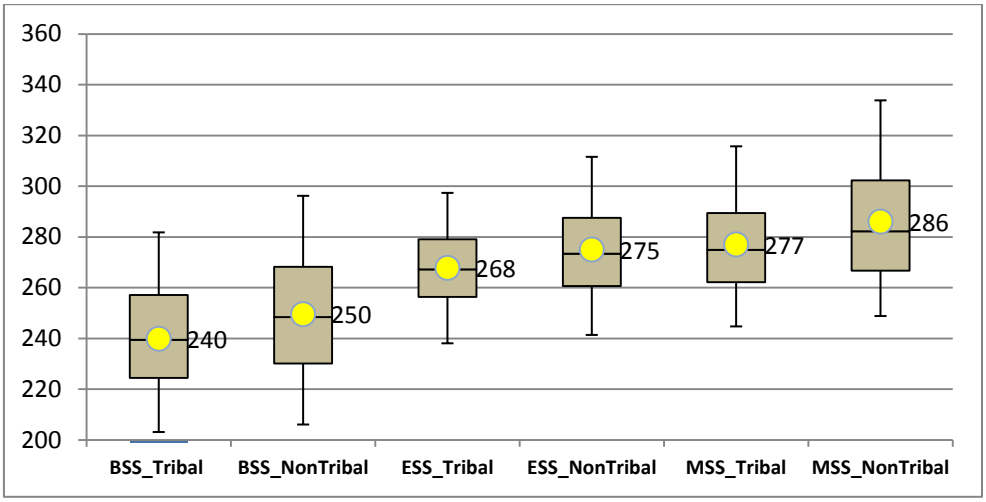


Figure 34 Grade 8 Students' Indigenous background and Learning outcomes

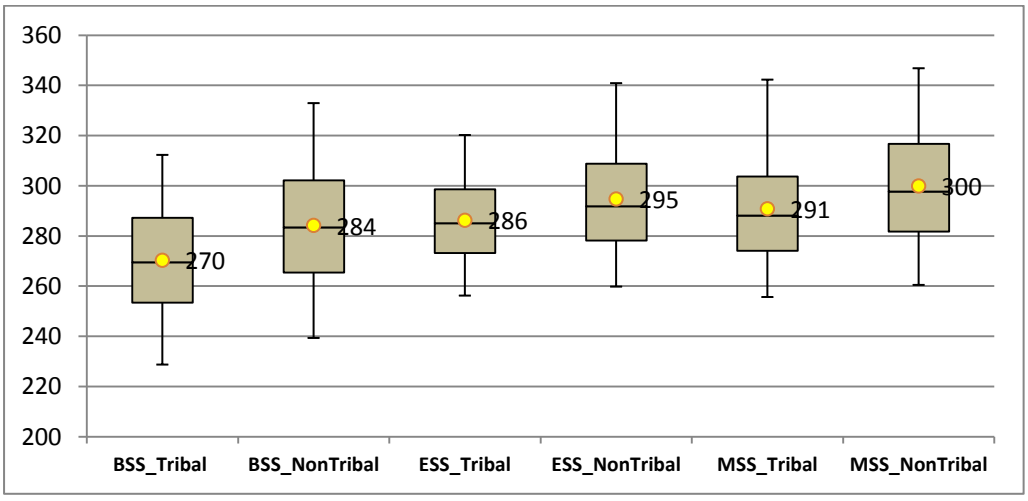


Figure 33 and 34 depict that students from non-tribal background performed better as compared to their tribal counterparts in all the three subjects. This trend is similar for both grade 6 and 8 students.

In terms of home background, while father's education has a significant positive effect on performance in Bangla, English and Mathematics, belonging to a tribe has a significant negative effect on all three outcomes. The type of house, whether it is Pucca/Semi- pucca or Katcha is not significantly related to any of the three outcomes after all other effects have been taken into account.

At level two, students taught by teachers who have a Masters level qualification perform at a significantly higher level in English but not in Bangla or Mathematics. A significant positive effect on achievement in Bangla and English - but not in Mathematics - can be observed for students who are taught in schools where more teachers hold a Bachelor of Education

qualification. In Mathematics, a significant positive effect on performance emerges for the number of years of teaching experience. In other words, students taught in schools where teachers have been teaching for longer perform at a higher level than students in schools where teachers have shorter teaching experience. Further analysis can be undertaken to understand the effect years of experience is having on student achievement.

It should be noted that all effects can be observed even after the effects of other variables that are important for educational achievement, for example father's education and teacher education, have been taken into account at both the student and the teacher levels.

While the summary table above indicates whether or not the effects examined in the initial model are significant, Tables 52 to 54 present details regarding the size of the coefficients and the associated standard error of those variables that were found to be significant and included in the final model for each subject (Table 52 for Bangla, Table 53 for English, Table 54 for Mathematics).

5.4.3 Factors associated with Bangla Learning outcomes

Table 52 Effect of teacher and student level variables on Bangla achievement

Level	Fixed Effect	Coefficient	Error	Significant level
	Intercept	262.0	1.8	Sig. at 0.01 level
Teacher level variable	Teacher's professional qualification	6.6	2.6	Sig. at 0.01 level
Student level variables	Father Education	3.0	0.65	Sig. at 0.01 level
	Tribal background	-13.1	1.7	Sig. at 0.01 level
	Students perception about teachers teaching strategy	3.3	0.44	Sig. at 0.01 level
	Students perception about their peers	-7.1	0.5	Sig. at 0.01 level

Table 52 shows the impact of demographic factors on learning achievement of student in Bangla. It informs that Bangla mean scale score will be 261 if all other variables included in this analysis remain constant that is zero. The positive coefficient indicates that the factor helps in improving student learning outcome in the subject however a negative coefficient indicates that the factor is impacting student learning negatively. For example the Bangla scale score will increase by three points for students whose father has at least attended secondary school while this score is reduced by 13 points for students who report belonging to a tribal group.

The results in Table 52 indicate that students who report that their teachers make the classes and learning interesting, explain things clearly and want to help students to learn perform at a higher level than their peers in Bangla. In contrast, students who report greater

levels of being hit or threatened by other students, disruptive behaviour of other students in class and other students spreading rumours about them perform at a lower level in Bangla, English and Mathematics.

5.4.4 Factors associated with *English Learning outcomes*

Final estimation of fixed effects (with robust standard errors)

Table 513 Effect of teacher and student level variables on English achievement

Level 1	Fixed Effect	Coefficient	Error	Significant level
	Intercept	277.2	1.8	Sig. at 0.01 level
Teacher level variable	Teacher Qualification	5.2	2.0	Sig. at 0.01 level
	Teacher's professional qualification	5.0	2.0	Sig. at 0.01 level
Student level variables	Father Education	2.0	0.5	Sig. at 0.01 level
	Tribal background	-7.8	1.5	Sig. at 0.01 level
	Gender	2.2	0.6	Sig. at 0.01 level
	Students perception about teachers teaching strategy	1.3	0.3	Sig. at 0.01 level
	Students perception about their peers	-3.2	0.4	Sig. at 0.01 level

In Table 53, informs the student achievement in English when all other variables included in this analysis remain constant. Hence, the average performance of students in English will remain 277 when a student has a father who is illiterate or has completed only primary school, who do not belong to a tribal group, are female and who attend schools in which fewer teachers have a Bachelor of Education degree. This score increases by two points for students whose father has at least attended secondary school and by 2.23 points if they are male. This score is reduced by 7.79 points for students who report belonging to a tribal group.

Again, Table 53 results also indicate that students who report that their teachers make the classes and learning interesting, explain things clearly and want to help students to learn perform at a higher level than their peers in Bangla. In contrast, students who report greater levels of being hit or threatened by other students, disruptive behaviour of other students in class and other students spreading rumours about them perform at a lower level in Bangla, English and Mathematics.

5.4.5 Factors associated with *Mathematics Learning outcomes*

Final estimation of fixed effects (with robust standard errors)

Table 524 Effect of teacher and student level variables on Mathematics achievement

Level 2	Fixed Effect	Coefficient	Error	Significant level
	Intercept	284.7	2.1	Sig. at 0.01 level
Teacher level variable	Teaching Experience	0.3	0.14	Sig. at 0.05 level
Student level variables	Father Education	1.3	0.5	Sig. at 0.01 level
	Tribal background	-5.9	1.1	Sig. at 0.01 level
	Gender	6.6	0.6	Sig. at 0.01 level
	Students perception about teachers teaching strategy	1.4	0.3	Sig. at 0.01 level
	Students perception about their peers	-2.8	0.34	Sig. at 0.01 level

At level 2, the positive coefficients for teacher qualification (5.22) and Bachelor of Education (4.96) indicate that students who are taught in schools where more teachers have a Masters as well as a Bachelor of Education degree perform at a higher level than peers in schools with teachers who have lower qualifications.

In Table 54, the results of the final two-level model for Mathematics are presented. The value of the intercept indicates the Mathematics score when the values of the predictors in the model are zero. Hence, the average performance of students with a father who is illiterate or has completed only primary school, who do not belong to a tribal group, are female and who attend schools where teachers have less teaching experience is a score of 284.74 with a standard error of 2.06. This score increases by 1.27 points for students whose father has at least attended secondary school and by 6.56 points if they are male. This score is reduced by 5.87 points for students who report belonging to a tribal group.

As for the previous two outcomes Table 54 also shows a positive coefficient for instructional strategies (1.42) and negative coefficient for uncooperative peers (-2.75). These results indicate that students who report that their teachers make the classes and learning interesting, explain things clearly and want to help students to learn perform at a higher level than their peers in Bangla. In contrast, students who report greater levels of being hit or threatened by other students, disruptive behaviour of other students in class and other students spreading rumours about them perform at a lower level in Bangla, English and Mathematics.

At level 2, the positive coefficient for teaching experience (0.29) indicates a very slight but non-trivial effect which suggests that students who are taught in schools where teachers have longer teaching experience perform at a slightly higher level than students who are taught in schools where teachers have shorter average teaching experience.

5.4.6 Detention in previous grade and Learning Outcomes

Figure 35 Detention in previous grade and Learning outcomes of Grade 8 students

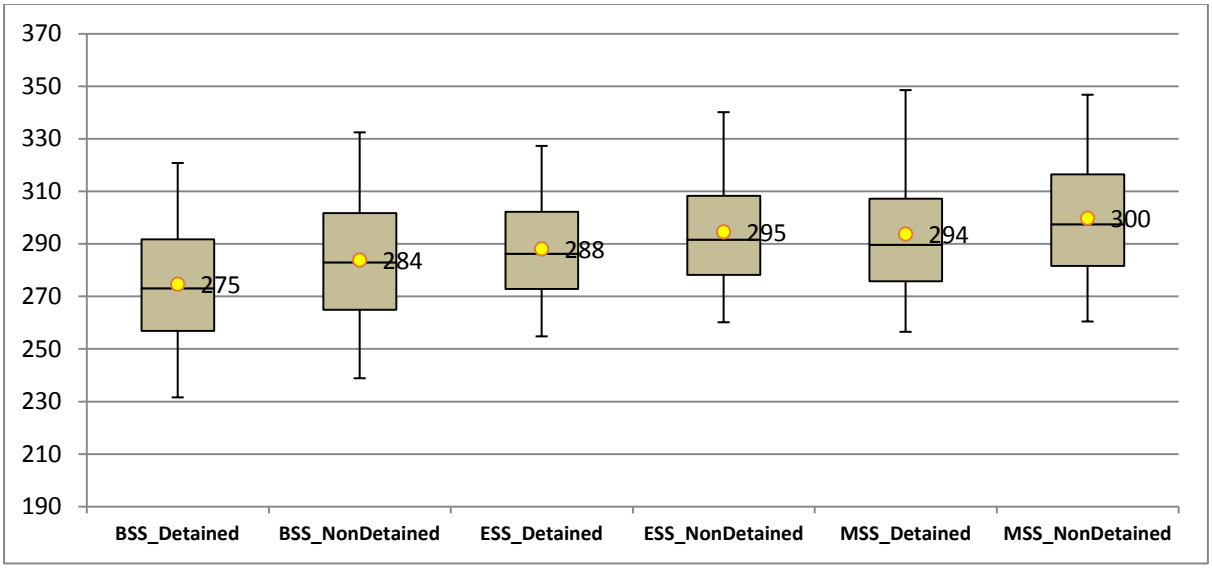
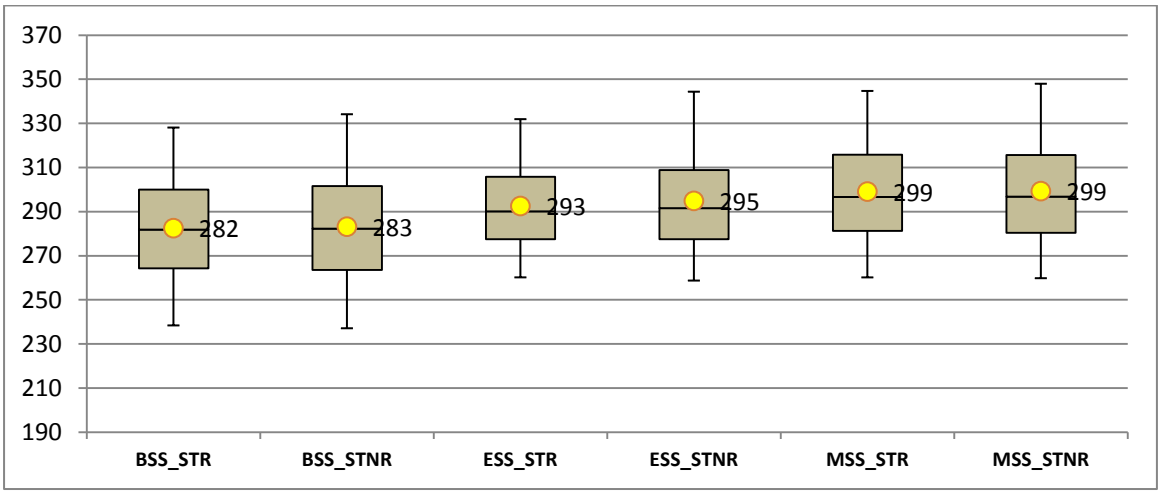


Figure 35 depicts that students are performing better in all three subjects when they are not detained in previous classes as compared to the students who were detained in previous classes.

5.4.7 PMT stipend and Learning outcomes

Figure 36 PMT stipend and Learning outcomes of Grade 8 students



The figure 36 shows the performance distribution of students who received stipend and who did not receive stipend in all three subjects. The distribution shows that both these groups performed similarly in all three subjects.

5.4.8 Head Teachers' perception on Teacher Efficiency and Student learning outcomes in Mathematics

For the purpose of this report the analysis for Head teacher's perception have been undertaken only for Mathematics. Head teachers were asked to respond about job satisfaction, understanding of

institutional goal and teaching performance of the teachers working in the school. A composite index for these three aspects was developed through Principal Component Analysis (PCA). A scatter below depicts the mathematics achievement and the head teacher's perception about his teacher's competency. Similar analysis can be undertaken for English and Bangla.

Figure 37 Head Teachers perception on his Teachers' efficiency and mathematics achievement

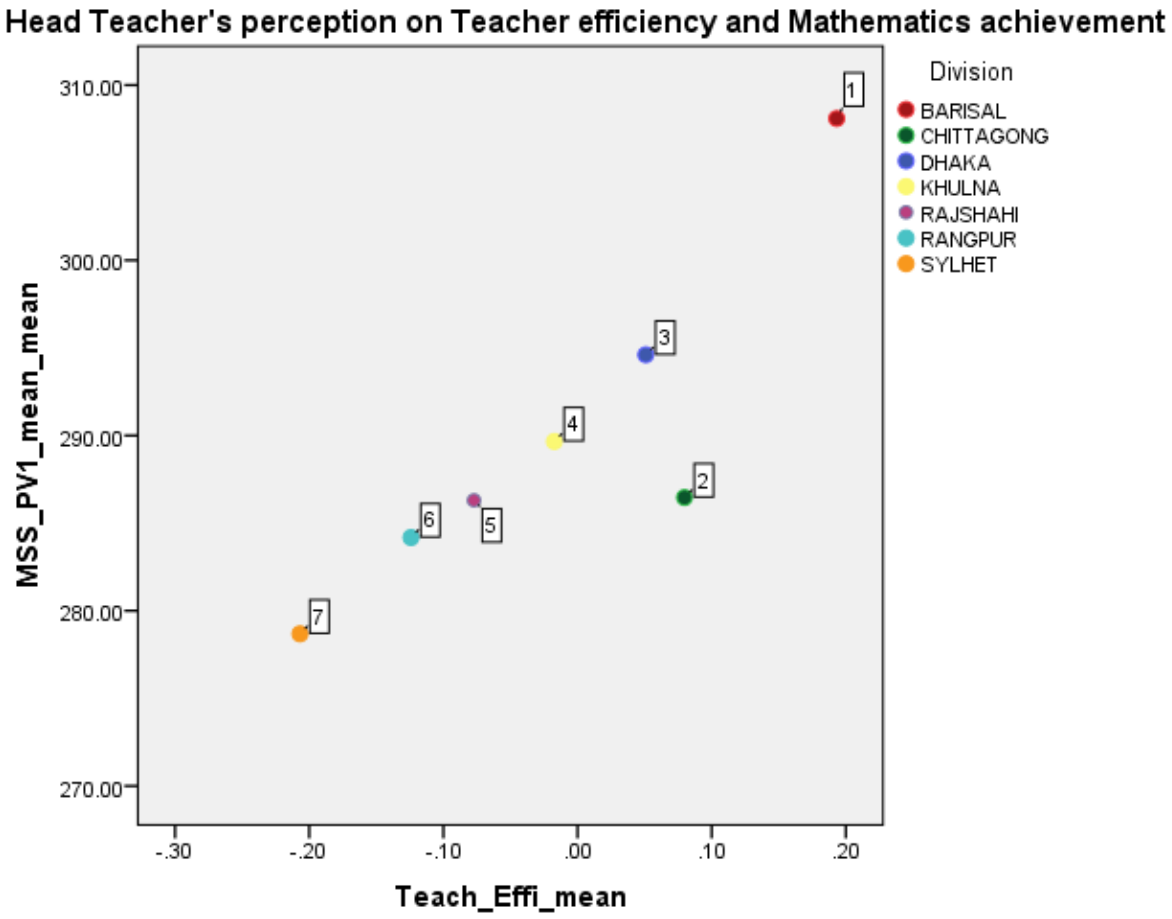
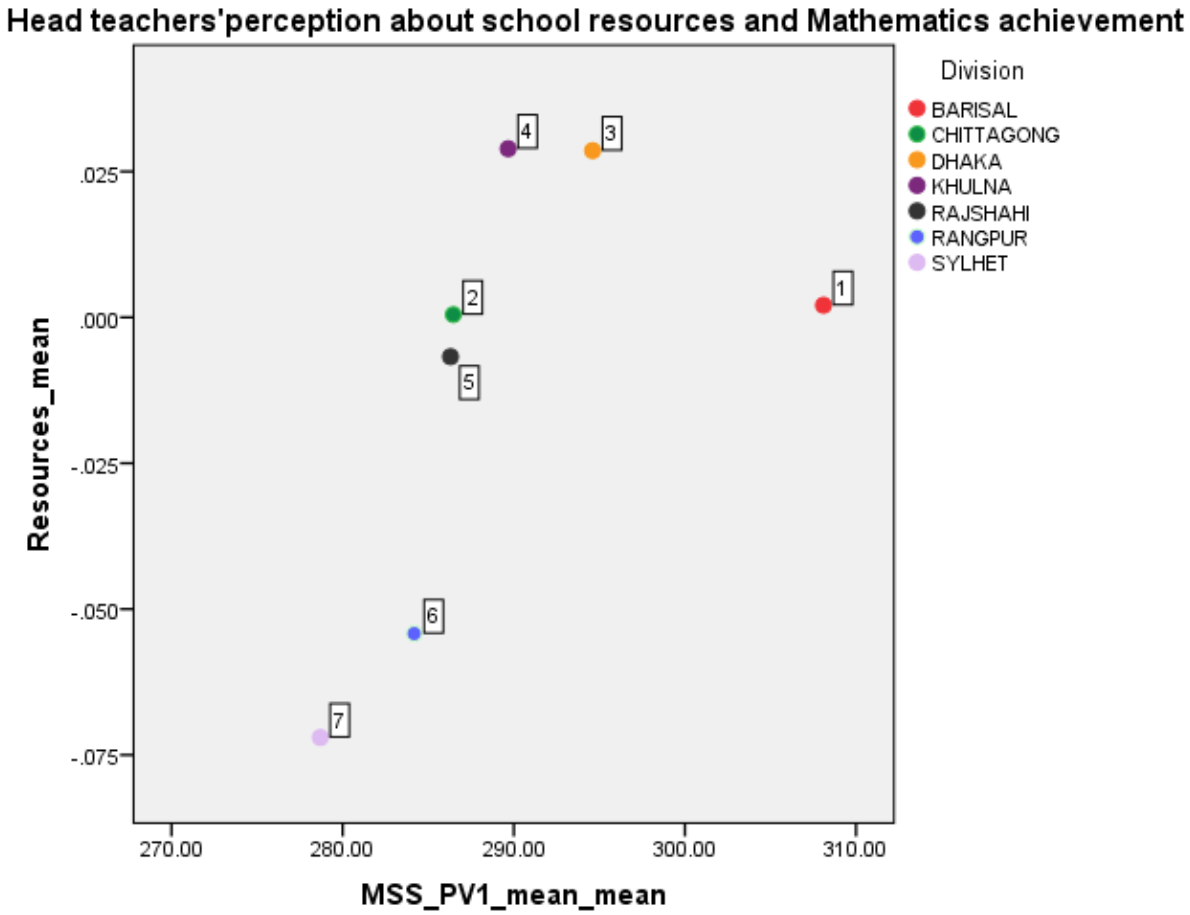


Figure 37 shows a linear and positive association between teacher efficiency and mathematics achievement. Students in school, from the Bangladesh administrative divisions, are performing better in mathematics where the head teacher perceives that his teachers are satisfied with thier job, understand institutional goal and are good at teaching. Sylhet division is low in teaching efficiency index and also low in mathematics performance while Barisal division having high teacher efficiency score shows high mathematics score.

5.4.9 Head Teachers' perception on lack of school resources and Student learning outcomes in Mathematics

Head teachers were asked to respond about gravity of teacher vacancy, lack of institution operating fund, and lack of lab and special classroom in the school. For this report, on these three aspects a composite index was developed through Principal Component Analysis (PCA) for mathematics achievement. A scatter was drawn as below depicting the mathematics achievement and the head teacher's perception about lack of resources.

Figure 38 Head Teachers perception about lack of resources and mathematics achievement

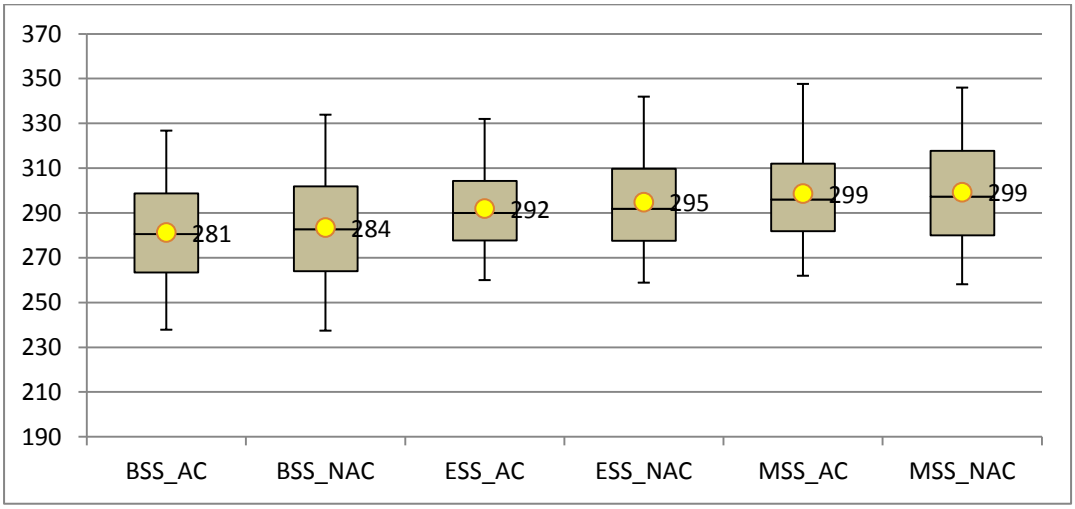


The scatter plot above shows that there is a linear and positive association between availability of resources in terms of teacher, operating fund and availability of lab and special classroom. Students from the Bangladesh administrative divisions perform better in mathematics when the head teacher perceives that these resources are adequate in his school. Head teachers from Sylhet division perceived that these resources are relatively scarce as compared to other division and also has low mathematics performance.

Similar analysis can be undertaken for Bangla and English.

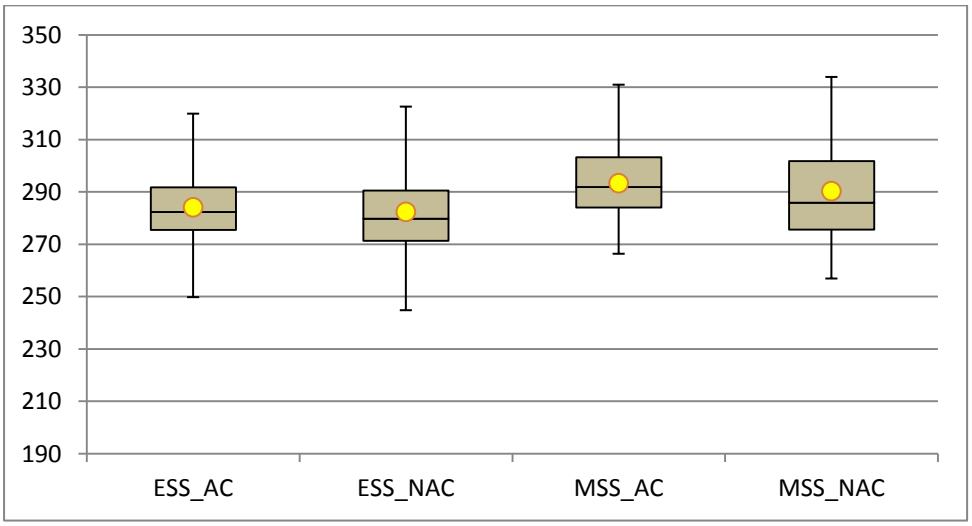
5.4.10 SEQAEP Intervention and Student Achievement

Figure 39 Students attending additional class under SEQAEP and Learning outcomes in Bangla, English and Mathematics



The figure above shows that the performance of students who have attended additional classes under SEQAEP similarly performed as compared to their counterparts who have not attended any additional classes under SEQAEP.

5.4.11 School Having Additional Classes and school mean achievement of students in English and Mathematics



Above graphs reveals that school mean scale score is slightly better in English and Mathematics where additional classes are undertaken under SEQAEP as compared to school s where additional classes are not taken.

5.5 Feedback: What Students Know and Can Do

Valuable diagnostic information can be interpreted from the LASI data for effective use by teachers at various levels of teaching learning processes. There is a wide variation of performances between students and between schools at both grade levels indicating that students are at different stages in learning and instruction quality varies from school to school. Item examples below illustrate what students can do at the easiest level and the highest level (Band 5).

BANGLA

GRADE 6

Q1

The item below tests the ability of pupils to locate and retrieve explicitly mentioned information from a persuasive text. Pupils need to first understand and locate the context ("during the vacation") and match the phrase "read a lot of books" (অনেক বই পড়ছি) to the option "reading books". The phrase is towards the beginning of a simple text set in a familiar context.

Strand	Reading Comprehension
Key	A
Skill	Knowledge
Descriptor	Retrieve explicitly stated information in

১ ছুটিতে সুমন কী করছিল?

ক বই পড়ছিল

খ মাকে সাহায্য করছিল

গ আত্মীয়দের সঙ্গে দেখা করছিল

ঘ বন্ধুদের সঙ্গে খেলাধুলো করছিল

Examination Board	B6Q01
Barisal	76.5%
Chittagong	70.4%
Comilla	74.1%
Dhaka	76.7%
Jessore	68.5%
Rajshahi	70.1%
Rangpur	70.5%
Sylhet	62.2%
Total	72.3%

Q18

This item tests the ability of pupils to identify information provided in different parts of a descriptive text and link them. They need to first locate comparisons between vegetables and parts of the lily plant, then they must identify which parts of the lily are being compared. Two layers of additional complexity in this item are the dense nature of the text and the requirement to write out the information. Teachers may also note that most of the questions where students had to write were found difficult.

Strand	Reading Comprehension
Scoring Guide	
Skill	A
Descriptor	Interpret by connecting related information in a short descriptive text

১৮ শাপলার কোন দুটি অংশকে সব্জির সঙ্গে তুলনা করা হয়েছে?

_____

Examination Board	B6Q18
Barisal	2.1%
Chittagong	7.7%
Comilla	5.9%
Dhaka	4.8%
Jessore	10.5%
Rajshahi	4.8%
Rangpur	4.9%
Sylhet	9.7%
Total	6.0%

GRADE 8

Q2

This item requires pupils to make pick out the correct piece of information in the presence of competing information. The various fundamental rights provided as options are mentioned in the text. Pupils are required to locate the information in the text and identify which one is mentioned as the one that requires the most support from the government. The information occurs towards the middle of the persuasive text.

২ জনগণের কোন মৌলিক অধিকার রক্ষার জন্য সরকারি সহায়তা দরকার সবচেয়ে বেশি?

ক অন্নের
খ বস্ত্রের
গ আধুনিক চিকিৎসার
ঘ যোগাযোগের

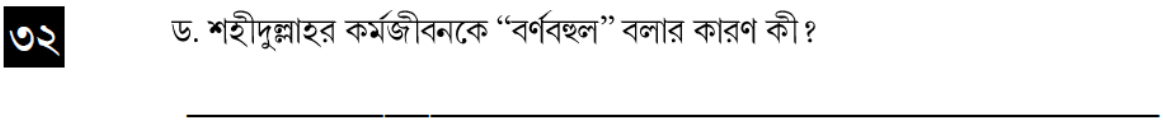
Strand	Reading Comprehension
Key	C
Skill	K
Descriptor	Retrieve explicitly stated information in a persuasive text

Examination Board	B8Q02
Barisal	88.9%
Chittagong	89.9%
Comilla	90.6%

Dhaka	88.1%
Jessore	87.1%
Rajshahi	89.0%
Rangpur	84.6%
Sylhet	86.9%
Total	87.9%

Q32

This item requires pupils to combine various pieces of information and summarise their essence. The pupils first need to understand the implicit link between the various details mentioned about Dr. Mohammed Shahidullah's life and the statement that he led a "colourful" life. Then, they must conclude that these details suggest that he was versatile. The fact that pupils must write out the answer adds some difficulty to the item. The text was an information text.



Strand	Reading Comprehension
Scoring Guide	অনুচ্ছেদ: ডঃ মহম্মদ শহীদুল্লাহ্ Item No.: 32 Item ID: BANBANMS005 প্রশ্ন: ডঃ শহীদুল্লাহ্‌র কর্মজীবনকে 'বর্ণবহুল' বলার কারণ কী? সম্ভাব্য সঠিক উত্তর (Code 01): • কারণ তিনি বিভিন্ন ধরণের কর্মে নিযুক্ত ছিলেন • কারণ তাঁর বিভিন্ন ধরণের কর্ম সম্পাদনের অভিজ্ঞতা ছিল। বেঠিক উত্তরের দৃষ্টান্ত (Code 0): • কারণ তিনি শিক্ষক/উপাধ্যক্ষ ইত্যাদি পদে কাজ করেছিলেন • কারণ তিনি ছাত্র থাকাকালেও চাকরি করেছিলেন
Skill	A
Descriptor	Synthesises information to arrive at a conclusion in a biographical text

Examination Board	**B8Q32**
Barisal	11.2%
Chittagong	10.3%
Comilla	14.9%
Dhaka	14.2%
Jessore	10.7%
Rajshahi	12.8%
Rangpur	12.7%

Sylhet	6.1%
Total	12.3%

ENGLISH

Grade 6

Q7

The item below tests the ability of pupils to locate details that are explicitly mentioned in a simple information text. Pupils need to understand that "every day" in text is actually "every school day" as mentioned in the key. The information is provided in the second paragraph and is easy to locate.

7 When does Ms Sumona teach English to Akash?

A from Monday to Sunday
B at lunchtime on Thursday
C on Monday before lunch
D every school day after lunch

Strand	Reading Comprehension
Key	D
Skill	K
Descriptor	Retrieve explicitly stated detail from a short information text

Examination Board	E6Q07
Barisal	77.5%
Chittagong	76.3%
Comilla	72.0%
Dhaka	77.0%
Jessore	74.4%
Rajshahi	68.4%
Rangpur	71.3%
Sylhet	59.5%
Total	73.5%

Q37

This item requires pupils to interpret and link information provided in an imaginative text. They need to understand that "meal" in the item refers to "dinner" in the text. Then they must link the details of the food provided in the text to the "dinner". Having pupils write out the answer adds a layer of difficulty to the item. The length of the text also contributes to the difficulty.

37 What meal did the two mice eat in the village?

_____

Strand	Reading Comprehension
Scoring Guide	

Serial No.	37
Item ID	BANENG1306TF03
Passage	Cousin's Visit
Question	What meal did the two mice eat in the village?
Possible Correct Answers (Code 01)	• rice • a few grains of rice/grains of rice • some rice/grains
Sample Wrong Answers (Code 0)	• bread • fruit • vegetables
Missing (Code 9)	Student has made no attempt to answer the question/ nothing written
Comments	Spelling and grammar **NOT** to be checked.

Skill	K
Descriptor	Link information across sentences in an imaginative text

Examination Board	E6Q37
Barisal	5.1%
Chittagong	.9%
Comilla	8.2%
Dhaka	9.8%
Jessore	12.0%
Rajshahi	8.9%
Rangpur	4.2%
Sylhet	1.6%
Total	7.7%

Grade 8

Q1

This item requires pupils to identify information from a narrative text that is explicitly mentioned. The information is provided in the very first paragraph and is easy to locate.

1 What was the argument about?

A who was colder
B who was louder
C who was cleverer
D who was stronger

Strand	Reading Comprehension
Key	D
Skill	K
Descriptor	Retrieve explicitly stated details from a short narrative text

Examination Board	E8Q01
Barisal	97.8%
Chittagong	98.6%
Comilla	99.0%
Dhaka	96.4%
Jessore	97.2%
Rajshahi	93.6%
Rangpur	96.8%
Sylhet	93.6%
Total	96.5%

Q29

This item tests pupils ability to identify the meaning of a word based on clues provided. The word "diet" is the title of a column in the table. Pupils need to understand that the heading often summarises the information in the column. They then need to match the option that best captures the information provided in the column with the word "diet". The text is a non-continuous information text.

29 What does ***diet*** mean in this text?

A what cats eat
B what size the cats are
C what animals hunt cats
D what animals live near the cats

Strand	Vocabulary
Key	A
Skill	A
Descriptor	Deduce the meaning of a word from contextual clues

Examination Board	E8Q29
Barisal	26.2%
Chittagong	12.5%
Comilla	18.2%
Dhaka	25.4%
Jessore	12.4%
Rajshahi	15.2%
Rangpur	19.0%
Sylhet	10.3%
Total	19.2%

Mathematics

Grade 6

BAN13GR6M004

১ ৯.০৩
-৩.১৭

সঠিক উত্তর কোনটি?

ক ৬.২০

খ ৬.১৪

গ ৫.৯৬

ঘ ৫.৮৬

File Name	Nick name	Key	Format
BAN13GR6M004	Decimal subtraction	D	MC

Content strand	K, A, U	Curr Ref TR1	Curr Ref TR2	Difficulty	Descriptor
Num	K	6N1.7		M	Subtract decimal numbers with regrouping

Option Reasoning	
Option A	Adds the decimal part and subtracts the integer part (Assumes the decimal and integer

	part as separate numbers)
Option B	9 – 3 is whole part and 17 – 3 is decimal part OR larger digit – smaller digit in each column
Option C	Missing carry over
Option D	Key

Examination Board	M6Q01
Barisal	86.2%
Chittagong	76.1%
Comilla	76.4%
Dhaka	83.1%
Jessore	83.5%
Rajshahi	81.1%
Rangpur	84.9%
Sylhet	73.9%
Total	82.2%

The item intends to assess the student ability to perform routine operations of addition and subtraction of decimal fractions that involve zero and regrouping of digits.

BAN13GR6M032

৩২ ৫০ জন ছাত্র-ছাত্রীকে ফুটবল অথবা ক্রিকেট পছন্দ করতে বলা হল। ফলাফল নিচে দেখানো হল।

	ছাত্র	ছাত্রী	মোট
ফুটবল	১৪	১২	২৬
ক্রিকেট	১৬	৮	২৪
মোট	৩০	২০	৫০

মোট ছাত্রীর কত ভাগ ক্রিকেট পছন্দ করে ?

ক $\frac{২০}{৫০}$

খ $\frac{৮}{৫০}$

গ $\frac{৮}{২৪}$

ঘ $\frac{৮}{২০}$

File Name	*Nick name*	*Key*	*Format*
BAN13GR6M032	*Tabular Data*	*D*	*MC*

Content strand	K, A, U	Curr Ref TR1	Curr Ref TR2	Difficulty	Descriptor
Data	U	6D8.1		M	Choose the fraction describing given subgroups from a two-way table

Option Reasoning	
Option A	Fraction of girl students
Option B	Fraction of girls in cricket of all students
Option C	Fraction of girls in cricket
Option D	Key

Examination Board	M6Q32
Barisal	44.5%
Chittagong	19.6%
Comilla	27.4%
Dhaka	22.6%
Jessore	22.7%
Rajshahi	20.4%
Rangpur	22.3%
Sylhet	15.9%
Total	24.4%

This item assesses students understanding of information or data presented in two-way tabular form. The students are expected to understand what do the numbers stand for and which data needs to be used to answer the question.

BAN13GR6M039

৩৫ গত বছর একটি বিদ্যালয়ে ২৫০ জন ছাত্র ছিল।

এই বছর আরও ১০% ছাত্র ভর্তি হল। এখন বিদ্যালয়ের ছাত্র সংখ্যা কত?

সমাধান কর ।

উত্তর: ----------জন ছাত্র

File Name	Nick name	Key	Format
BAN13GR6M039	Percentage increase	275	CR

Content strand	K, A, U	Curr Ref TR1	Curr Ref TR2	Difficulty	Descriptor
Num	A	6N2.5		M	Find the increased number when percentage increase is given

Code 2:
275 students
Code 1:
25 (calculates 10% of 250 only)
Code 0:
Other incorrect responses

Examination Board	M6Q35
Barisal	49.2%
Chittagong	20.1%
Comilla	30.0%
Dhaka	24.6%
Jessore	26.4%
Rajshahi	20.1%
Rangpur	11.6%
Sylhet	15.3%
Total	24.7%

This item requires students to use percentages in real context and understanding of relation between increase by some given percentage and the total amount after increase.

Grade 8

BAN12NC24

8 একটি গাড়ির ৩০০ কিলোমিটার যেতে ৫ ঘন্টা সময় লাগে।

গাড়িটির গড় গতি কত?

উত্তর: = _____ কিলোমিটার প্রতি ঘন্টা।

Filename	BAN12NC24	**Nickname**	Km per hour
Key	60	**Descriptor**	Calculates a basic average speed
Option reasoning		**A**	
		B	
		C	
		D	

See Y8 Text book page 85 item 12

Code 1: 60
Code 0: Other responses

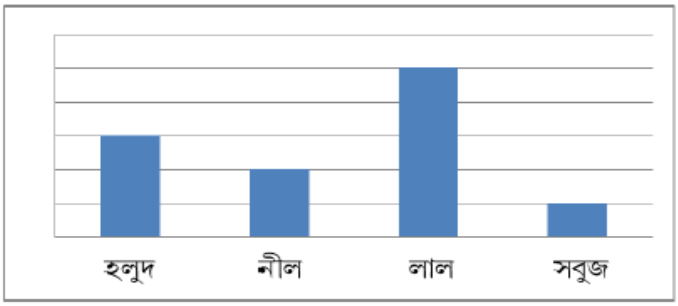
Examination Board	M8Q04
Barisal	90.1%
Chittagong	77.5%
Comilla	90.4%
Dhaka	83.2%
Jessore	78.0%
Rajshahi	81.8%
Rangpur	74.2%
Sylhet	71.2%
Total	81.1%

The item assesses student in using averages in daily life and real contexts.

BAN12RP1301

৩৪ ৩৩ জন শিক্ষার্থীর প্রত্যেকে একবার করে হলুদ, নীল, লাল এবং সবুজ —এই চারটি রঙের মধ্যে একটি করে নির্বাচন করল।

নিচের লেখচিত্রে শিক্ষার্থীরা কেমনভাবে রঙ নির্বাচন করেছে —তা দেখানো হয়েছে, কিন্তু সেখানে অক্ষ-এর মান উল্লেখ করা হয় নি।



কত জন শিক্ষার্থী লাল নির্বাচন করেছে?

উত্তর: = _____

_____ students.

Filename	BAN12RP1301	**Nickname**	Unlabelled graph
Key	15	**Descriptor**	Solve problems on ratio and proportion in some basic areas of real life situations.
Option reasoning		**A**	
		B	
		C	
		D	

Code 2: 15 with or without working
Code 1: Working shows each unit represents 3 students.
For example: Scale (3, 6, 9 ...) is written on the vertical axis
For example: G = 3 [Infer as meaning "3 students chose green."]
For example: 6 students chose blue [This shows that each unit represents 3]
For example: 33/11 [This shows that each unit represents 3]
Code 0: Other responses

Examination Board	M8Q34
Barisal	38.1%
Chittagong	16.6%
Comilla	18.9%
Dhaka	25.3%
Jessore	19.8%
Rajshahi	21.6%
Rangpur	20.6%
Sylhet	10.4%
Total	23.0%

This item intends to assess student ability to handle ratio and proportions in complex unfamiliar situations. They are expected to use proportional thinking to find the scale of the graph to work out the number of items in some category.

5.6 Concluding Comments and way forward

Bangladesh wants to see its children given the skills necessary to achieve their full potential, to see them able to participate effectively in the local and global economy, and to live better, more satisfying and rewarding lives and quality education is the key to this. A range of government initiatives have been introduced to improve access to education and to improve the learning outcomes for all Bangladeshi students.

LASI was established to measure just how well students learn and to monitor progress in learning. This information also provides insight into the effectiveness of the initiatives. It is important that the data from LASI is used to plan further support to the schools and allocate resources.. The LASI data from future assessment cycles will then inform the success and improvement of such interventions and effectiveness of the allocation of resources. A few critical matters that may be deliberated before finalising the future cycles

- Gender differences were not significant and indicate the equity of the Bangladesh education system.
- The difference between examination boards is small to medium in both grades all subjects. Syhlet consistently performed poorer than other boards.
- Difference between General Education schools and Madrasah needs further investigations.
- Disparities within SEQEAP schools are surprisingly large, yet the socio-economic status of these schools is relatively similar. Need to monitor current strategies carefully and perhaps target specific schools to investigate why some are doing so much better than others
- Further studies related to Tribal students may be undertaken to identify the issues and related solutions to ensure at par development.
- Analysis for factors impacting Bangla and English may be undertaken as has been done in Mathematics in this report.
- Research on school improvement informs that creating a culture of trust promotes learning steps may need to taken to support school leaders to create such an environment.
- Head Teacher's perception analysis indicates that there is a strong correlation between teacher efficiency and learning achievement due to their orientation towards institutional goals and their teaching practice. Including orientation sessions for teachers explaining institutional goals during Teacher training programs is recommended.
- SEQAEP institutions are dealing with marginalised students therefore in the future cycles it can be considered to collect academic data for student achievement to measure growth in learning as per interventions.
- To ensure educational reforms are well implemented and have across the country impact and are improving learning growth at secondary level it is recommended that the LASI program should include all secondary institutions in Bangladesh. However, since it is still critical to provide learning's to SEQAEP institutions to ensure the pace of learning a representative sample of SEQAEP institutions can be selected so as to support policy framework for SEQAEP.
- From the test development point of view, future administrations should focus on stretching out the top items and fill the gaps on the scale so as to assess students learning growth. The quality assurance process for test administration, evaluation and data entry needs to be further strengthened to ensure standardization of processes across the country. For evaluation computer based marking or scannable booklets are the two options that may be considered. It is further suggested that the trial should be conducted at the same time in the academic year as the main study, that is, if the main study is to be conducted at the end of the academic year in December then the trial should also be conducted in December of the year before**.** This recommendation arises from the trials for both cycles providing significantly

difference estimates of item difficulty from those in the main study. Alternatively, it can be considered to trial next cycles items with the main study.

- Detailed diagnostic information for teachers helps to improve classroom teaching and achievement. Reporting by sub-scales can provide more detailed information to the stakeholders of the strengths and weaknesses of students. The current assessment framework and test design allows assessing the core topics of the subjects, however it is recommended that the programme is expanded to include further sub-scale development in the next cycle. It is also recommended that writing be assessed and reported separately from reading. Writing is an important aspect of language development and learning and as the results are indicating students are not performing well in questions that expect them to write, it is recommended the writing be included in the next cycle of LASI.
- Dissemination of LASI results and findings and their relevance for classroom practice, school planning, and national education policy is recommended. Workshops should be organised in all districts that provide simplified and straightforward explanations to teachers of the findings and how NSA information can be used to improve student learning

Appendix I.

Table A Frequencies for original items forming attitudinal scales used in HLM analyses

INSTRAT - Instructional strategies: Factor score based on responses to the following statements	**Strongly agree**	**Agree**	**Neither agree nor disagree**	**Disagree**	**Strongly disagree**
Q26_11 My teachers are well prepared	65.9	26.9	3.3	2.4	1.5
Q26_14 My teachers listen to what I have to say	66.5	27.0	2.6	2.1	1.7
Q26_15 My teachers explain things to me clearly	68.4	25.2	3.0	1.8	1.7
Q26_22 My teachers really want to help me learn	72.6	23.4	1.8	1.1	1.0
Q26_26 My teachers make the work we do in class interesting	69.9	25.5	2.1	1.4	1.1
Q26_28 My teachers are easy to understand	62.1	30.6	3.4	2.4	1.5
Q26_35 My teachers make school work enjoyable	65.4	28.5	2.8	1.9	1.4
Q26_38 My teachers make learning interesting	71.0	24.2	1.8	1.4	1.6
UNCPEER - Uncooperative peers: Factor score based on responses to the following statements					
Q26_05 I have been teased in an unpleasant way recently at my school	15.7	14.5	11.3	28.7	29.8
Q26_16 I have been deliberately hit, kicked or threatened by another student recently	16.6	13.7	9.8	23.6	36.3
Q26_19 It's often hard to learn in class, because some students are really disruptive	27.2	23.7	9.0	20.4	19.6

Q26_20 I have been bullied recently at school	20.4	16.6	11.9	25.7	25.5
Q26_23 Other students often spread rumours about me at my school	15.0	13.1	11.9	26.3	33.7
Q26_24 The behaviour of some students in class makes it hard for me to do my work	24.3	21.1	8.8	24.4	21.4
Q26_34 It's often hard to listen to the teacher in class, because other students are misbehaving	28.1	25.0	9.8	18.1	19.0
SELCONC - Academic self-assessment: Factor score based on responses to the following statements					
Q26_12 I am good at my school work	52.0	35.5	5.2	4.4	3.0
Q26_18 I am keen to do very well at my school	73.0	23.3	1.7	1.0	1.0
Q26_32 I think I am generally successful at school	57.7	33.5	4.3	2.9	1.7
Q26_33 I am a very good student	59.6	32.4	4.3	2.4	1.3

References

Bandyopadhyay, S., Cornell, D. G., & Konold, T. R. (2009). Validity of three school climate scales to assess bullying, aggressive attitudes, and help seeking. *School Psychology Review*, *38*(3), 338-355.

Bond, L., Butler, H., Thomas, L., Carlin, J., Glover, S., Bowes, G.,& Patton, G. (2007). Social and school connectedness in early secondary school as predictors of late teenage substance use,mental health, and academic outcomes. *Journal of Adolescent Health*, *40*, 357.e9–357.e18.

Cohen, J., McCabe, E. M., Michelli, N. M., & Pickeral, T. (2009). School climate: Research, policy, practice, and teacher education. *Teachers College Record, 111*(1), 180-213.