

**A Report on**

**Students' Performances in Competency-based Test Items:**

**A Review Analysis of Students' Answer Scripts of PECE 2018**



**Faculty of Testing and Evaluation**

**National Academy for Primary Education (NAPE)**

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## ACKNOWLEDGEMENTS

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The procedure used to assess student learning at the system level is variously referred to as a learning assessment, system assessment and assessment of learning outcomes. One of the key indicators of quality education is checking students' performance in their taught subjects. Conducting summative assessment on a large scale helps to understand what extent students are able to achieve competency in particular subjects and which regions perform better.

PECE is considered as the largest arrangement of summative assessment in our country and has started since 2009. In the early years, traditional items were used to assess students' learning in summative assessment. From 2012, Competency-based Test Items (CBTIs) were first introduced in PECE; where only 10% of the traditional test items were replaced by CBTIs.

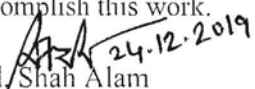
NAPE is entitled to develop competency-based test items which are being used to assess the achievement of students' learning competencies. The gradual inclusion of competency-based items in PECE, by replacing traditional items, implemented in previous consecutive years. In 2018, all the PECE questions were 100% competency-based and MCQ items were excluded from PECE, and different eight sets of questions were administered in different regions across the country.

Like as previous years, in collaboration with MoPME and DPE, NAPE has prepared such kind of report by reviewing students' answer scripts of PECE 2018. The main purpose of this study is to provide information for policy planning, enhance classroom teaching and improve instructions in order to improve students' achievement.

I would like to give my heartfelt thanks to the Faculty of Testing and Evaluation and NAPE faculty members who have been prepared this report by putting their critical thoughts, professionalism and sincere work. NAPE also thanks DPEOs and the UEOs for providing the sample student's answers scripts as requested to accomplish this analysis report on time.

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Especially, NAPE is delighted to convey gratitude to the Secretary, Ministry of Primary and Mass Education and Director General, Directorate of Primary Education for their intensive support to accomplish this work.

 24.12.2019  
Md. Shah Alam  
Director General  
National Academy for Primary Education (NAPE)  
Mymensingh

# EXECUTIVE SUMMARY

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Involvement of students in the assessment process can take place in mainly two ways: formative assessment and summative assessment. The summative assessment focuses on measurement and reports on student achievement mainly for administrative purposes, like- certifying competence, promoting one class to another and informing stakeholders.

PECE was first introduced in 2009 with a view to ensuring quality education. Since 2012, a great initiative has taken by the authority to introduce Competency-based Test Items (CBTIs) in PECE, where only 10% of the traditional test items were replaced by CBTIs. Following the gradual inclusion of CBTIs in previous years, in PECE 2018, the items were 100% competency-based. And different sets of questions were administered across the county for each subject.

Like as previous years, NAPE prepares this study report by reviewing the students' answer scripts. The objectives of the study are- (a) to know what extent students are performing in the CBTIs on each subject; (b) to visualize the students' performance in CBTIs in each region; and (c) to find out the quality of marking in assessing the students' answer scripts.

A total of 800 answer scripts for five subjects (Bangla, English, Mathematics, Bangladesh and Global Studies, Elementary Science) were collected from eight regions by stratified random sampling procedure which covered the entire country. After completing the data entry, subject-wise five online database files were created automatically which were then converted to Statistical Package for the Social Sciences (SPSS) data files for analysis. Simple descriptive statistics such as frequency, mean and standard deviation were used for analysis. Simple graphs such as bar charts, column charts were used to represent data where suitable.

After analyzing students' answer scripts, the following **findings** have been devised:

## **Subject wise students' performances:**

- In Bangla, students' performance of Chandpur region was very satisfactory and that was above 92%. On the contrary, the students' performance of Mymensingh and Dinajpur regions was not up to the mark and that was below 69%.
- Students' performance in English, the students of Chandpur region showed high performance and that was above 95%. On the contrary, Mymensingh region was not up to the mark and that was below 60%.

- In Mathematics, the overall performance of students in Chandpur region was high and that was above 97%. On the contrary, the students' performance of Dinajpur region was not up to the mark in mathematics and that was below 55%.
- Students' performance in Bangladesh and Global Studies (BGS), Chandpur region showed the best performance with average marks of about 94. Students of Cox's Bazar region showed a better performance with an average of above 80% marks. On the contrary, Dhaka and Mymensingh regions demonstrated the lowest performance bearing average marks about 68.
- In Elementary Science, Chandpur region showed the best performance with the average marks of about 93. The Students of Chattogram and Cox's Bazar regions showed better performance with averages of above 80% marks. Whereas, Sylhet region demonstrated the lowest performance bearing average marks about 48.50. It is also mentionable that students of Gazipur and Mymensingh regions also showed comparatively lower performance with averages of 65.75 and 67.30 respectively.

#### **Region-wise students' performances:**

- The students of Chandpur region got above 90% in all subjects and it indicated a high achievement. They got a high score of about 97% marks in Mathematics and their lowest mark was 92.6% and that is in Science subject.
- The students of Chattogram region got above 75% in all subjects and it indicated a satisfactory result. They got the highest marks in Mathematics about 87% marks and the lowest mark was 75.7% in English subject.
- The students of Cox's Bazar region got above 75% in all subjects and it indicated a satisfactory result. They got the highest marks in Bangla about 83% marks and the lowest mark was 75.2% in English subject.
- The students of Dhaka region got above 68% in all subjects and it indicated a satisfactory performance. In Mathematics, they got a high score of about 78% marks and their lowest mark was 68.83% and that is in Bangladesh and Global Studies subject.
- The students of Dinajpur region got above 54% in all subjects and it indicated a low performance in all subjects. Besides, they got the highest marks in Science subject at 77% marks and the lowest mark was 54.05% in Mathematics subject.
- The students of Gazipur region got above 65% in all subjects and it indicated an average performance. In addition, they got the highest marks in Bangladesh and Global Studies about 80% marks and the lowest mark was 65.75% in Science subject.

- The students of Mymensingh region got above 59% in all subjects and it indicated a low performance in each subject. Besides, they got the highest marks in Bangladesh and Global Studies about 68% marks and the lowest mark was 59.1% in English subject.
- The students of Sylhet region got above 48% in all subjects and it indicated a low performance in each subject. Besides, they got the highest marks in Mathematics about 77% marks and the lowest mark was 48.5% in Science subject.
- It is observed that the students of all regions got on an average about 73% to 78% marks in each subject; and it showed satisfactory performance in each subject.
- While justifying **the quality of marking**, it is found inappropriate marking happened more or less in all subjects. In most of the cases, over marking was occurred in SCRQ and CRQ type test items. Some of the examiners gave overall marks except for giving individual marks on sub-questions. Examiners also did mistakes in calculating the total marks. Besides, they missed or forgot to put marks on one or more given answers which affect students' final results.

### **Recommendations**

The researcher made the following recommendations by surmising the facts.

- Classroom teaching should have improved especially in English and Mathematics subjects. As students' weaknesses were found in answering short questions and composition writing in English; and they also faced problem in doing problem-solving in the subject of Mathematics.
- Provide opportunities for students to practice answering the question in each subject through competency-based items. Furthermore, it is need to develop competency-based items in school level for terminal and annual examinations by the teachers themselves and orient the students about the competency-based test items.
- Training should have arranged in field level on Test Item Development and Marking Students' Answer Scripts in an effective way to enhance the professional capacity of teachers. Few incongruities were observed in marking answer scripts, those issues could be solved if the teachers are trained on this matter.
- It needs to allocate sufficient time for the marker to assess the students' answer scripts appropriately. Time limitation could be a factor in under marking and over marking as found in students' answer scripts.
- Emphasis should give in improving teaching-learning practices and school monitoring of Dinajpur and Mymensingh regions as the students of those regions are not able to show satisfactory performance in all subjects in PECE.

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## LIST OF ACRONYMS

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Acronyms	
BGS	Bangladesh and Global Studies
CBTI	Competency-Based Test Item
CRQ	Constructed Response Question
DPE	Directorate of Primary Education
DFID	Department for International Development
GoB	Government of Bangladesh
MCQ	Multiple Choice Question
MoPME	Ministry of Primary and Mass Education
NAPE	National Academy for Primary Education
NCTB	National Curriculum and Textbook Board
NSA	National Student Assessment
PECE	Primary Education Completion Examination
PEDP	Primary Education Development Programme
SCRQ	Short Constructed Response Question
SD	Standard Deviation
SDG	Sustainable Development Goals
SPSS	Statistical Package for the Social Sciences

# 1 INTRODUCTION

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Bangladesh has made tremendous progress over the last decades in ensuring access to primary education for all. Improving educational quality has become a top strategic priority of our government; which also considered as a key issue to achieve Sustainable Development Goals (SDG). Quality Education helps in building careers and also broadens our vision and thought processes, besides it also provides learners with the opportunity to acquire knowledge and skills needed to contribute to the national economy. Quality primary education enhances students' cognitive skills, knowledge, and tastes that lead to greater productivity, earnings and health ( Shafiq, 2013). Thus, improving the educational performance of primary grade students is significant for both economic and social progress (NSA Report, 2017).

Assessment entails measurement of learning, analysis to diagnose problems, and use of the findings to guide remedial action. A national assessment is a survey of schools and students (and sometimes teachers) that is designed to provide evidence, at the level of the education system, about students' achievements at a particular stage of education (DFID, 2011). Effective use of assessment findings includes applying the information gained to improve the quality of student learning. It also indicates the integration of assessment information into Education Management Information Systems for making decisions for the future.

Involvement of students in the assessment process can take place in mainly two ways: formative assessment and summative assessment. A learner could be assessed what they are being taught in the school. Moreover, students could also be assessed by measuring the skills and competencies that they have learned from their entire education cycle (Roy, 2016, p. 09). Formative assessment deals with how judgments about the quality of student performances can be used to shape and improve the student's competence more (Sadler, 1989). Whereas the summative focus on measurement and report on student achievement mainly for administrative purposes, like- certifying competence, promoting one class to another, informing stakeholders, etc (Restrepo, 2017).

A major component of initiatives taken by the Government of Bangladesh is an improved Primary Education Completion Examination (PECE) and considered the assessment as a key to the progress in the development of ensuring the quality of education. After completing grade 5, students were asked to sit for Primary Education Completion Examination and it is considered as a summative assessment in Bangladesh.

## Review analysis of answer scripts of PECE 2018

An examination for assessing competency gains is a new concept in Bangladesh. Therefore, teachers and students have very little experience in answering and assessing competency-based test items. There were concerns that many students might fail to pass the examinations and at the same time examiners might face difficulties in assessing the answer scripts. That is why Competency-Based Test Items (CBTIs) started to be introduced since the 2012 PECE, where only 10% of the traditional test items were replaced by CBTIs.

### **1.1 BACKGROUND OF PECE**

In previous years, traditional test items were used to assess students' performance in PECE rather than including competency-based test items. According to Roy (2016), students could be assessed by using textbook contents or taken contents from outside the textbook by maintaining a similar difficulty level. General practices of good assessment apply when assessing any subject competencies. It is critically important that the array of content assessments taken by Grade 5 students should be fair and valid (National Academy for Primary Education, 2014).

PECE was first introduced in 2009 with a view to ensuring quality education. In PEDP3 main document (2011), one of the important disbursement-linked indicators was strengthening Grade-5 examination by introducing competency-based test items considering the terminal competencies of the recent curriculum which was developed by NCTB. It also suggested increasing the percentages of competency-based items in grade-5 examination each year gradually (Directorate of Primary Education, 2011).

An examination for assessing competency achievements was a new concept in Bangladesh. Teachers and students had very little experience in assessing and answering competency-based test items. There were concerns that many students might fail to pass the examinations and at the same time examiners might face difficulties in assessing the answer scripts. That is why, the Competency-Based Test Items (CBTIs) started to introduce since the 2012 PECE, where only 10% of the traditional test items were replaced by CBTIs (NAPE, 2015). According to the plan of GoB and PEDP3, in 2013 PECE, 25% of the test items were CBTI, in 2014 35%, in 2015 50%, in 2016 65% and in 2017 80% of the test items were CBTI. Following this step in 2018, the entire PECE was administered through competency-based, meaning the entire test was comprised of CBTIs; and different sets of questions were administered in PECE across the country.

## **1.2 PRIMARY EDUCATION COMPLETION EXAMINATION 2018**

In 2018, the PECE was administered from November 18 to November 26 across the country. A total number of 27,77,270 students appeared in the examinations; where 12,78,742 are male and 14,98,528 are female (Bangla News 24, 2018). From this year, there was no MCQ in the exam which was used in previous years. Besides, different sets of questions were administered in PECE across the country like as previous years. In total, 26,52,896 students attended all the exams of PECE, among which 25,88,904 students emerged successfully. The result published on 24 December 2018 and the pass rate was 97.59 per cent (The Daily Star, 2018). It is considered as a large student assessment arrangement in our country as well as in the world.

## **1.3 THE RATIONALE OF THE STUDY**

Reviewing the answer scripts of PECE students is an initiative of the Ministry of Primary and Mass Education (MoPME) to evaluate students' achievement after completion of the primary education cycle. A key purpose of this review analysis is to provide accurate data and information to inform policy planning, enhance classroom teaching, and improve instructions in order to improve student achievement.

A summative assessment like PECE helps to get the overall idea of students' performance in all major subjects that were taught in school. In previous years, traditional test items were used to assess students' performance in PECE rather than including competency-based test items. According to Roy (2016), in recent days competency-based assessment is getting priority than content-based assessment. In the competency-based testing process, the competencies fixed for the students should be both measurable and observable. Students could be assessed by using textbook contents or taken contents from outside the textbook by maintaining a similar difficulty level.

The gradual inclusion of competency-based items in the PECE raises some issues to know, like- to what extent students are able to perform in achieving learning competencies in each taught subject? What are the learning gaps in achieving the desired competencies? So, it needs to conduct a study to explore the answers to those questions. NAPE has been entitled to conduct this review study and disseminate the findings to the authority concerned as well as to field level for further action.

#### **1.4 OBJECTIVES OF THE STUDY**

This study focuses on the competency-based test items used in PECE 2018. The objectives of the study are:

- (a) to know what extent students are performing in the CBTIs on each subject;
- (b) to visualize the students' performance in CBTIs in each region; and
- (c) to find out the quality of marking in assessing the students' answer scripts.

## 2 METHODOLOGY

A total of eight sets question paper was administered in the whole country for PECE where the country is divided into eight regions considering district as a unit. Each region consisting of eight districts and one set of question among the eight sets is supplied in each region for conducting the examination.

### 2.1 SAMPLE AND SAMPLING

A total of 800 answer scripts for five subjects (Bangla, English, Mathematics, Bangladesh and Global Studies, Elementary Science) were selected by stratified random sampling procedure which covered the entire country. Strata were selected according to the regions which make eight strata for eight regions. From each region, a total of 100 answer scripts were selected, 20 from each of the five subjects were selected randomly. Then NAPE sent a request letter to Directorate of Primary Education (DPE) for supplying the selected sample answer scripts. DPE issued a letter to the requested Upazilas to send the required number of scripts to NAPE.

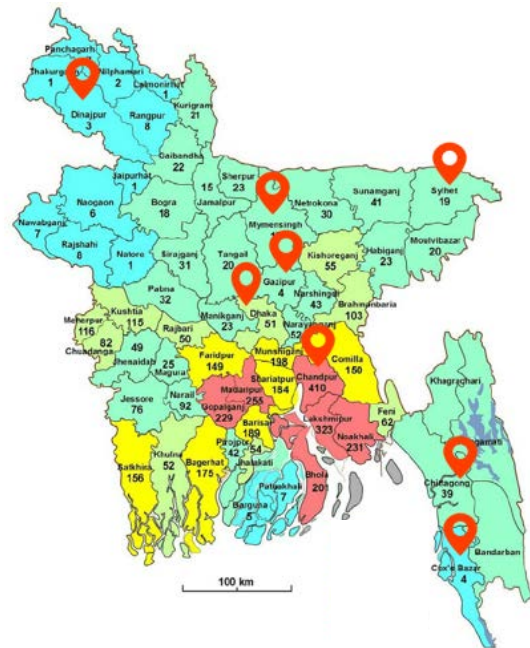


Figure 1: Regions for sample selection

Table 1: Sampling at a glance

Regions	Number of answer scripts					
	Bangla	English	Math	BGS	Science	Total
Chandpur	20	20	20	20	20	100
Chattogram	20	20	20	20	20	100
Cox's Bazar	20	20	20	20	20	100
Dhaka	20	20	20	20	20	100
Dinajpur	20	20	20	20	20	100
Gazipur	20	20	20	20	20	100
Mymensingh	20	20	20	20	20	100
Sylhet	20	20	20	20	20	100
<i>Total</i>	<i>160</i>	<i>160</i>	<i>160</i>	<i>160</i>	<i>160</i>	<i>800</i>



## **2.2 DATA CLEANING, ENTRY AND QUALITY CONTROL**

After getting the answer scripts, NAPE distributed the answer scripts to the subject specialists to review the scripts by following the marking scheme. Then subject-wise data were input into a form developed by using an online platform so that inputted data could be checked in live. Data were inputted by the subject specialists as they are the key persons who developed the marking schemes and they could maintain the quality of data, especially when they identified over marking and under marking of the answer scripts.

## **2.3 DATA ANALYSIS**

After completing the data entry, subject-wise five online database files were created automatically which were then converted to SPSS data files for analysis. Simple descriptive statistics such as frequency, mean and standard deviation were used for analysis and also correlation was devised as inferential statistics. Simple graphs such as bar chart, column chart were used where suitable.

### 3 ANALYSIS OF STUDENTS' PERFORMANCES

The presented data have derived by reviewing students answer scripts and presented according to the objectives of the study.

#### 3.1 SUBJECT-WISE STUDENTS' PERFORMANCES

##### 3.1.1 Bangla Subject

General Features of the Bangla PECE 2018 Question:

*Table 2: Matrix of Bangla Question*

Number of Total Items	14
Exam duration	2 hours and 30 minutes
Types of texts	Seen Texts, Unseen Texts, Poem
Item types	Matching, Fill in the blanks, Short Questions, Creative Writing
Learning Domain Addressed	Remembering, Understanding, Applying

Table 2 describes the matrix of PECE-2018 Bangla questions. Different eight sets of questions were administered in different regions across the country. A total number of 14 questions were given in the question paper and time duration for exam was 2 hours and 30 minutes. Both seen text and unseen text were used in Bangla question; besides descriptive text, imaginative texts and poem were used in a different set of questions. Students were asked to give their answers by answering matching, fill in the blanks, short questions, letter writing and composition writing. Learning sub-domain like-remembering, understanding and applying were addressed in those questions.

*Table 3: Students' performance in seen text*

Questions	N		Allocated marks	Mean	Standard Deviation (SD)
	Answered	Not answered			
1.Word meaning	159	0	5	4.05	1.27
2.SCRQ	159	0	10	7.79	2.30
<b>Total</b>	<b>159</b>		<b>15</b>	<b>11.84</b>	<b>3.10</b>

Table 3 illustrates the students' performances in word meaning and short constructed response question of seen text by giving their mean score and standard deviation.

In word meaning, the average mark of students was around 4 marks out of 5 and the marks deviation was observed with a low range of about 1.3. Besides, the students' mean score was about 8 marks (out of 10) in short questions, and the standard deviation was 2.30. In the seen text, the average achieved score was around 12 marks (out of 15) with the range of deviation of about 3.

## Review analysis of answer scripts of PECE 2018

Overall, all examinees responded all the items given in the seen text, and the mean score of students' achievements indicated good performance in seen text items, and the standard deviation in their achieving marks observed low.

*Table 4: Students' performance in unseen text*

Questions	N		Allocated marks	Mean	SD
	Answered	Not answered			
1. Fill in the blanks	158	1	5	4.63	0.75
2. SCRQ	153	6	15	10.41	3.49
<b>Total</b>	<b>159</b>		<b>20</b>	<b>14.62</b>	<b>4.27</b>

Table 4 describes the students' performances in fill in the blanks and short constructed response question of unseen text by giving their mean score and ranges of deviation.

In fill in the blanks, students got around 5 marks out of 5 and the marks deviation was observed very low with a range of about 0.75. Besides, the students' mean score was about 11 marks (out of 15) in short questions, and the standard deviation was 3.49. The average achieved score was around 15 marks (out of 20) in the items of unseen text with a range of deviation of 4.27.

Overall, all of the students responded to all the items given in unseen text (except 7 students), and the mean score of students' achievements indicated good performance in unseen text items. The standard deviation of answering short questions was higher in comparison with the standard deviation of answering fill in the blanks.

*Table 5: Students' performance in grammar*

Questions	N		Allocated marks	Mean	SD
	Answered	Not answered			
1. Transformation of verbs	158	1	5	4.22	1.35
2. Making interrogative sentence	153	6	5	4.16	1.22
3. Compound letter and making words and sentences	157	2	10	8.81	1.90
4. Punctuation marks	154	5	5	3.81	1.21
5. Express in a word	159	0	5	4.28	0.98
6. Synonym-Antonym	158	1	5	4.34	1.05
<b>Total</b>	<b>159</b>		<b>35</b>	<b>29.18</b>	<b>5.88</b>

Table 5 shows the information about the students' performances in grammar-related test items (like-transformation of verbs, making interrogative sentence, compound letter, using punctuation, express in a word and synonym-antonym) by giving their mean score and standard deviation.

Students' average marks in the transformation of verbs, making interrogative sentence, compound letter, using punctuation, express in a word and synonym-antonym were 4.22, 4.16, 8.81, 3.81, 4.28

## Review analysis of answer scripts of PECE 2018

and 4.34 respectively. The highest standard deviation observed in compound letter related items and the lowest standard deviation observed in 'express in a word' related item. Besides, the students achieved on an average about 30 marks (out of 35) in six different grammar-related items with the range of standard deviation of around 6.

Overall, most of the examinee responded to all the grammar-related items, and the mean score of students' achievements showed a good performance in grammar. Students exposed a good performance in synonym-antonym but their average performance in using punctuation marks was comparatively low.

*Table 6: Performance in seen poems*

Questions	N		Allocated marks	Mean	SD
	Answered	Not answered			
1. 1st SCRQ	149	10	2	1.75	0.49
2. 2nd SCRQ	130	29	5	3.38	1.20
3. 3rd SCRQ	128	31	3	2.41	0.78
<b>Total</b>	<b>150</b>		<b>10</b>	<b>6.73</b>	<b>2.59</b>

Table 6 displays the students' performances in seen poems by giving their mean score and standard deviation.

In first short question, students' average mark was 1.75 (out of 2), and in second and third question the numbers were 3.38 (out of 5) and 2.41 (out of 3) respectively. In poem related questions, the students got on an average about 7 marks out of 10, the standard deviation of their performance was around 3.

Overall, few examinees did not respond to all the items given in seen poem, and the number of students was 31 who did not answer the third short question. Students' performance was observed satisfactory in answering the three different questions given in the seen poem.

*Table 7: Students' performance in creative writing*

Questions	N		Allocated marks	Mean	SD
	Answered	Not answered			
1. Writing an application/a letter	151	8	5	3.88	1.23
2. Essay writing	145	14	10	6.72	2.21
<b>Total</b>	<b>155</b>		<b>15</b>	<b>10.06</b>	<b>3.71</b>

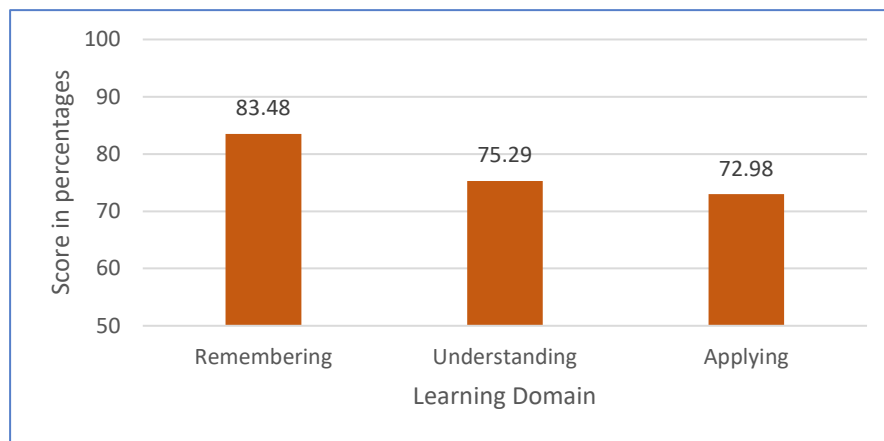
Table 7 describes the students' performances in creative writing (writing application and essay writing) with telling their mean score and standard deviation.

## Review analysis of answer scripts of PECE 2018

In writing application or letter, the average mark of students was around 4 marks out of 5 and the marks deviation was observed with a low range of 1.23. Besides, the students' mean score was below 7 (out of 10) in essay writing, and the standard deviation was 2.21.

In creative writing, the average achieved score was around 10 (out of 15) with the range of deviation of 3.71.

Overall, students' performance in letter or application writing was better in comparison with writing essay. Few numbers of students did not respond to the items of creative writing.



*Figure 2: Domain wise overall students' performance*

Figure 2 illustrates the students' performances in the category of learning domains especially in remembering, understanding and applying related questions.

In remembering type questions, the average mark of students was around 84%. Besides, they got about 75% and 73% in understanding and applying related questions respectively.

Overall, students' performance in remembering type questions was better in comparison with understanding and applying related questions. Students got on an average of around 75% in understanding and applying related questions.

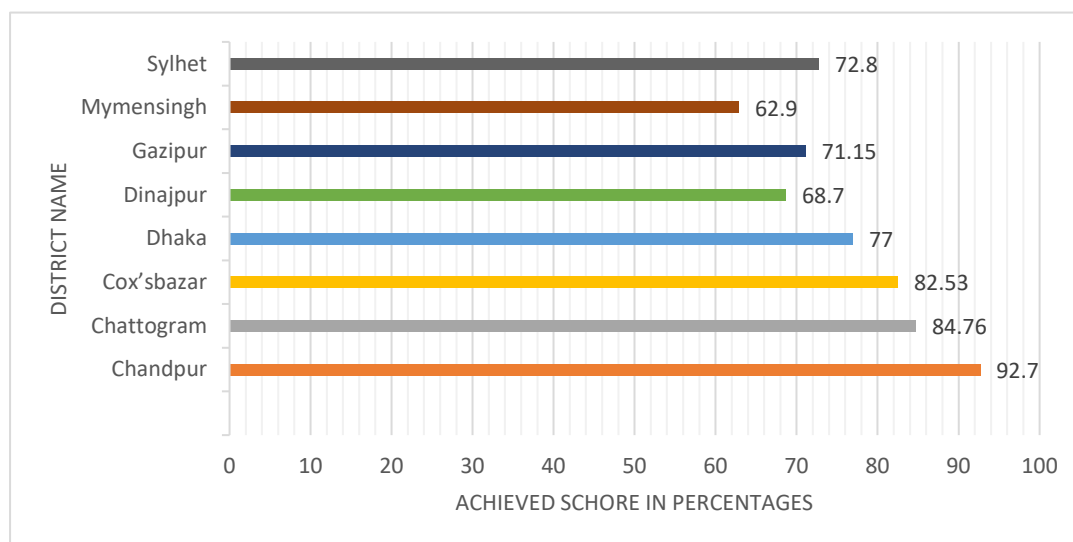


Figure 3: Region-wise overall students' performance

Figure 3 illustrates the percentage of students' performances in different regions in Bangla. The students of Chandpur scored the highest marks at around 93%, whereas the students of Mymensingh got the lowest marks at about 63%. On the other hand, the students of Sylhet, Gazipur, Dinajpur, Dhaka, Cox'sbazar and Chattogram achieved about 73%, 71%, 69%, 77%, 83% and 85% marks respectively.

Overall, the performance of students of Mymensingh and Dinajpur regions was not up to the mark and that was below 69%, on the contrary, the students' performance of Chandpur region was satisfactory and that was above 92%.

### 3.1.2 English Subject

#### General Features of the English PECE 2018 Question

Table 8: Matrix of English Question

Number of Total Items	13
Exam duration	2 hours and 30 minutes
Types of texts	Seen Texts, Unseen Texts
Item types	Matching, Fill in the blanks, Re-arrange, Form fill up, Short Questions, Creative Writing
Learning Domain Addressed	Remembering, Understanding, Applying

Table 8 illustrates the matrix of PECE-2018 English questions. Different eight sets of questions were administered in different regions across the country. A total number of 13 questions were given in the question paper and time duration for exam was 2hours and 30 minutes. Both seen text and unseen text were used in English question; besides descriptive text and imaginative texts were used in a different set of questions. Students were asked to give their answer by answering matching, fill in the

## Review analysis of answer scripts of PECE 2018

blanks, form fill up, short questions, letter writing and composition writing. Learning sub-domain like- remembering, understanding and applying were assessed through those questions.

*Table 9: Students' performance in seen text*

Questions	N		Allocated marks	Mean	SD
	Answered	Not answered			
1. Matching/Fill in the Blanks	158	2	5	4.37	1.11
2. True/False	160	0	6	5.21	1.16
3. SCRQ	160	0	12	7.57	3.55
4. Short Composition	156	4	10	5.46	3.40
<b>Total</b>	<b>160</b>		<b>33</b>	<b>22.41</b>	<b>7.55</b>

Table 9 presents the students' performances in a matching, true-false, short question and short composition of seen text by giving their mean score and standard deviation.

In matching/ fill in the blank items, the average mark of students was around 4 marks out of 5 and the marks deviation was observed with a low range of about 1.1. Students' average mark in true-false was 5.21 (out of 6) with a standard deviation of around 1.2. Besides, the students got on average about 8 marks (out of 12) in short questions, and the standard deviation was little high 3.40. Whereas, in short composition writing students got low average marks at about 5 (out of 10), and the standard deviation was 3.4.

In seen text related items, the average achieved score was around 22 marks (out of 33) with a high range of standard deviation of about 8.

Overall, most of the examinees responded all the items given in the seen text, and the mean score of students' achievements indicated an average performance in seen text items, and the standard deviation in their achieving marks observed high. Students' performance in writing short composition were low in comparison with other items in seen texts.

*Table 10: Students' performance in unseen text*

Questions	N		Allocated marks	Mean	SD
	Answered	Not answered			
1. Fill in the Blank	160	0	5	4.51	0.96
2. True-False	159	1	6	5.43	0.83
3. SCRQ	149	11	10	6.72	3.12
4. Letter Writing	149	11	10	6.93	2.52
<b>Total</b>	<b>160</b>		<b>31</b>	<b>22.63</b>	<b>6.79</b>

Table 10 shows the students' performances in fill in the blanks, true-false, short question and letter writing of unseen text by giving their average score and standard deviation.

## Review analysis of answer scripts of PECE 2018

In fill in the blank items, the average mark of students was 4.5 marks out of 5 and the marks deviation was observed with a low range of about 1. Students' average mark in true-false was 5.43 (out of 6) with a low standard deviation of around 0.8. Besides, the students got on average about 7 marks (out of 10) in short questions, and the standard deviation was little high 3.12. Whereas in letter writing, students got on an average of about 7 (out of 10), and the standard deviation was 2.5.

In seen text related items, the average achieved score was around 23 marks (out of 31) with a high range of standard deviation of about 7.

Overall, most of the examinees responded all the items given in the unseen text, but few students did not respond short question and letter writing items, and the mean score of students' achievements indicated satisfactory performance in unseen text items. Students' performances in answering short questions were low in comparison with other items in unseen texts.

*Table 11: Students' performance in writing*

Questions	N		Allocated marks	Mean	SD
	Answered	Not answered			
1.Short Composition	156	4	10	5.46	3.40
2.Letter Writing	149	11	10	6.93	2.52
3.WH Question	156	4	10	6.96	3.15
4.Time/date/day	152	8	5	4.22	1.29
5.Rearrange	156	4	10	8.15	2.51
6.Form Fill up	159	1	5	4.86	0.43
<b>Total</b>	<b>160</b>		<b>50</b>	<b>35.34</b>	<b>11.29</b>

Table 11 represents the students' performances in writing activities (like- creative writing, grammatical question and form fill up) by showing their mean score and standard deviation.

Six different activities were given to assess students writing skills in English. In writing a short composition, students' average mark was 5.46 out of 10. Their mean scores were about 7 (out of 10) in letter writing and making WH questions. Besides, they got on an average 4.22 (out of 5), 8.15 (out of 10) and 4.86 (out of 5) in time-date-day, rearrange and form fill up related items respectively.

In writing-related items, the average achieved score was around 35 marks (out of 50) with a high range of standard deviation of about 11.

Overall, the total mean score of students' achievements indicated satisfactory performance in writing-related items. Students showed their good performances in answering rearrange and form fill up items. On the other hand, students' performance was observed low in composition writing in compare with other items of writing.



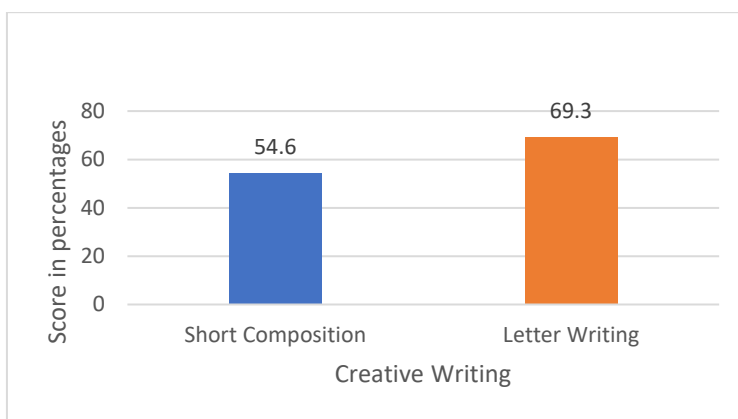


Figure 4: Students' performance in creative writing

Figure 4 shows the students' performance in writing a short composition and letter writing in percentages. Students had the opportunity to express their ideas freely in short composition and letter writing in terms of creative writing. It is observed that students performed higher in letter writing than writing short composition by around 15%.

Table 12: Skill-wise overall performance

Questions	N		Allocated marks	Mean	SD
	Answered	Not answered			
Reading	160	0	50	37.41	9.70
Writing	160	0	50	35.34	11.29

Table 12 represents the students' performances in reading and writing items by giving their mean score and standard deviation. Students' average scores were 37.41 and 35.34 in reading and writing items respectively.

Overall, students' performance in reading items was a bit better than writing items. Students writing score differences (standard deviation) was much higher than reading scores.

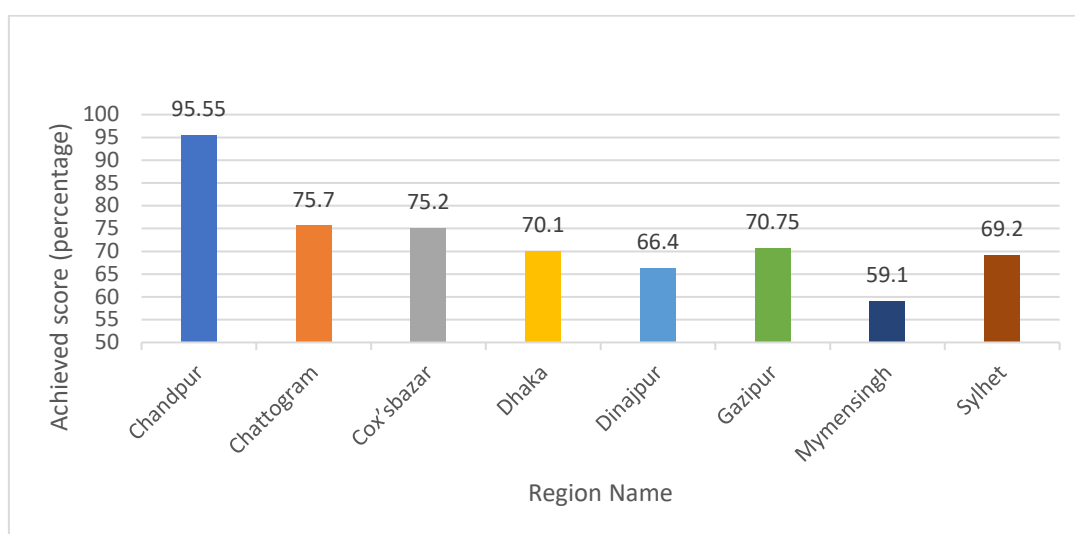


Figure 5: District wise students' performances

## Review analysis of answer scripts of PECE 2018

Figure 5 illustrates the percentage of students' performances in different regions in English. The students of Chandpur scored the highest marks at around 96%, whereas the students of Mymensingh got the lowest marks at about 59%. On the other hand, the students of Chattogram, Cox's Bazar, Dhaka, Dinajpur, Gazipur and Sylhet achieved about 76%, 75%, 70%, 66%, 71% and 69% marks respectively.

Overall, the performance of students in Mymensingh region was not up to the mark and that is below 60%. On the contrary, the students' performance of Chandpur region was very good and that was above 95%.

### 3.1.3 Mathematics Subject

#### General Features of the Mathematics PECE 2018 Question

*Table 13: Matrix of Mathematics Question*

Number of Total Items	Short Question-20, CRQ- 10(2/3 part in each CRQ)
Exam duration	2 hours and 30 minutes
Key areas	Numbers and calculation, Measurement, Geometry, Statistics
Item types	Short Questions, Constructed Response Question (CRQ)
Learning Domain Addressed	Procedural Knowledge, Conceptual Understanding, Problem Solving

Table 13 describes the matrix of PECE-2018 Mathematics questions. Different eight sets of questions were administered in different regions across the country. A total number of 20 short questions and 10 CRQs were given in the question paper and time duration for exam was 2hours and 30 minutes. Each CRQ has three parts and each question has an alternative option. Students were asked to give their answer by answering short questions and CRQs. Learning sub-domain like- procedural knowledge, conceptual understanding, problem-solving were addressed through those questions.

*Table 14: Region-wise performance in SCRQs*

Regions	Allocated marks	Mean	SD
Chandpur	20	19.85	0.37
Chattogram	20	19.35	0.88
Cox's Bazar	20	18.05	2.37
Dhaka	20	17.35	3.12
Dinajpur	20	17.80	3.24
Gazipur	20	17.50	2.35
Mymensingh	20	18.20	2.67
Sylhet	20	18.85	1.53

Table 14 describes the students' performances of different regions in answering short questions in mathematics by giving their mean score and standard deviation.

Twenty short questions of different levels (like-procedural knowledge, conceptual understanding and problem-solving) were given to students to answer. Students have no alternative options but answers all short questions.

On average, the students of Chandpur and Chattogram regions scored above 19 marks (out of 20) with a minimum standard deviation of about 1.

The students of Cox's Bazar, Mymensingh and Sylhet got average marks about 18; on the other, the students of Dhaka, Dinajpur and Gazipur regions got a low average and mean score was around 17 with a high standard deviation of about 3.

Overall, the students of Chandpur and Chattogram regions scored high in short questions in compare with other regions. On the contrary, the students of Dhaka, Dinajpur and Gazipur showed the least performances in short questions related items with a high range of standard deviation.

*Table 15: Students' Performances in numbers and calculation*

Questions	N (160)		Allocated marks	Mean	SD
	Answered	Not answered			
Problems involving four rules	160	0	8	6.48	2.72
LCF & HCF	150	10	8	6.52	2.62
Fraction	152	8	16	11.82	5.12
Average	155	5	8	6.66	2.35
Percentage	145		8	5.41	3.13

Table 15 depicts the students' performances of different learning areas of mathematics in answering problem-solving related questions by giving their mean score and standard deviation.

It is evident that different four types of questions (like- Problem involving four rules, LCF & HCF, Fraction, Average and Percentage) were given in the exam under the category of numbers and calculation. In a problem involving four rules, LCF & HCF and Average related competency-based items students' mean scores were 6.48, 6.52 and 6.66 respectively. It indicated students' performances were satisfactory in those times. Whereas, students scored below in the percentage related items in compare with other number and calculation related items with a high range of standard deviation. Students showed also average performances in fraction related items where their mean score was about 12 (out of 16) with a standard deviation of around 5.

## Review analysis of answer scripts of PECE 2018

Overall, under the category of numbers and calculation related items, students' performance was satisfactory in Problem involving four rules, LCF & HCF and Average related competency-based items. On the other hand, in Percentage and Fraction related items students scored very low and few students did not attempt in the LCF & HCF, Fraction and Percentage related items.

*Table 16: Region-wise performance in number and calculation*

Regions	Allocated marks	Mean	SD
Chandpur	48	47.15	1.31
Chattogram	48	42.40	4.56
Cox's Bazar	48	35.25	15.06
Dhaka	48	36.20	10.97
Dinajpur	48	20.05	14.71
Gazipur	48	37.90	13.19
Mymensingh	48	26.55	12.83
Sylhet	48	35.95	11.74

Table 16 illustrates region-wise students' performances in number and calculation related questions by giving the mean score and standard deviation.

It is found that the students of Chandpur and Chattogram regions scored high in comparison with other regions, their mean score was around 47 and 42 respectively with a low figure of standard deviation. The mean score of students of Cox's Bazar, Dhaka, Gazipur and Sylhet regions was about 35, 36, 38 and 36 respectively with a high range of standard deviation. It indicates the average performances of the students of those regions. However, the students of Dinajpur and Mymensingh scored very low in comparison with other regions and the mean scores were around 20 and 27 respectively with a high range of standard deviation.

Overall, the students of Chandpur region got the highest marks in number and calculation related items in compare with other regions; whereas, the students of Dinajpur region got the lowest marks in that competency-based item. Besides, the standard deviation of Cox's Bazar indicates the gap between students' score was very high.

*Table 17: Region-wise performance in measurement*

Regions	Allocated marks	Mean	SD
Chandpur	12	12.00	.00
Chattogram	12	8.75	2.53
Cox's Bazar	12	7.15	4.36
Dhaka	12	8.55	4.14
Dinajpur	12	5.35	3.59
Gazipur	12	8.70	4.38
Mymensingh	12	5.41	3.28
Sylhet	12	7.75	3.95

Table 17 displays region-wise students' performances in measurement related items by giving the mean score and standard deviation.

It is evident that the students of Chandpur region scored very high in comparison with other regions, their mean score was around 12. The mean score of students of Chattogram, Cox's Bazar, Dhaka, Gazipur and Sylhet regions was about 9, 7, 9, 9 and 8 respectively with a high range of standard deviation. It indicates an average performance of the students in this item. However, the students of Dinajpur and Mymensingh scored very low in comparison with other regions and the mean scores were around 5 with a high range of standard deviation.

Overall, the students of Chandpur region got the highest marks in measurement related items in compare with other regions; whereas, the students of Dinajpur region got the lowest marks in that competency-based item.

*Table 18: Region-wise performance in Geometry*

Regions	Allocated marks	Mean	SD
Chandpur	12	10.35	1.39
Chattogram	12	9.80	2.38
Cox's Bazar	12	9.45	2.33
Dhaka	12	10.05	2.48
Dinajpur	12	8.32	2.08
Gazipur	12	9.65	2.58
Mymensingh	12	10.21	2.86
Sylhet	12	9.35	3.25

Table 18 portrays region-wise students' performances in geometry related items by indicating mean score and standard deviation.

The mean scores of the students' performance of Chandpur and Mymensingh regions were above 10 with a low range of standard deviation. It indicates good performance. In comparison, the mean scores of students' performances of Chattogram, Cox's Bazar, Dhaka, Dinajpur, Gazipur and Sylhet were below 10; and it shows an average performance of those regions.

Overall, in geometry related item, the students of Chandpur region got the highest marks in comparison with other regions; whereas, the students of Dinajpur region got the lowest marks in geometry. It is noted that the students of Mymensingh region performed better in geometry items than other competency-based items.

*Table 19: Region-wise performance in statistics*

Regions	Allocated marks	Mean	SD
Chandpur	8	7.70	.57
Chattogram	8	6.45	1.73
Cox's Bazar	8	5.79	2.25
Dhaka	8	5.55	2.52
Dinajpur	8	4.69	3.05
Gazipur	8	5.00	2.36
Mymensingh	8	5.78	2.05
Sylhet	8	6.18	2.30

Table 19 represents region-wise students' performances in statistics related items by showing mean score and standard deviation.

The mean score of the students' performance of Chandpur was about 8 with a low range of standard deviation. It indicates a high performance of students. In contrast, the mean scores of students' performances of Chattogram, Cox's Bazar, Dhaka, Mymensingh and Sylhet were around 6. It indicates the average performance of students. Whereas, the students of Gazipur and Dinajpur scored 5 and 4.69 respectively. It is evident that students' performance of Dinajpur was very poor and it was about 5 with a high range of standard deviation.

## Review analysis of answer scripts of PECE 2018

Overall, in statistics related item, the students of Chandpur region got the highest marks in comparison with other regions; whereas, the students of Dinajpur region got very poor marks in statistics with a high range of standard deviation.

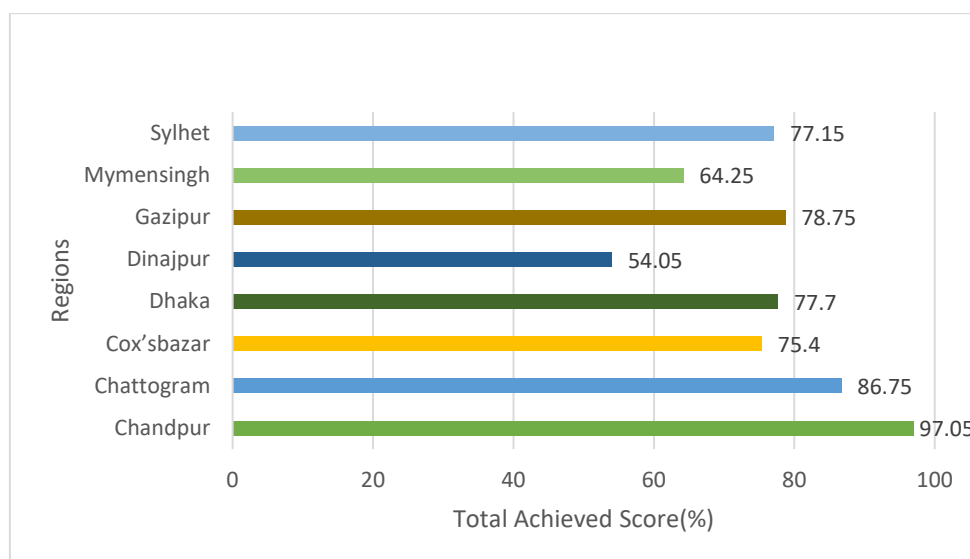


Figure 6: Region-wise overall performance in mathematics

Figure 6 illustrates the percentage of overall students' performances in different regions in Mathematics.

The students of Chandpur scored the highest marks at around 97%, whereas the students of Dinajpur got the lowest marks at about 54%. On the other hand, the students of Sylhet, Mymensingh, Gazipur, Dhaka, Cox's Bazar and Chattogram achieved about 77%, 64%, 79%, 78%, 75% and 87% marks respectively.

Overall, the performance of students of Dinajpur region was not up to the mark in mathematics and that was below 55%; on the contrary, the students' performance of Chandpur region was high and that was above 97%.

### 3.1.4 Bangladesh and Global Studies

General Features of the Bangladesh and Global Studies PECE 2018 Question

Table 20: Matrix of BGS Question

Number of Total Items	Short Questions-15, Fill in the Blanks-14, Matching-1, CRQs-10
Exam duration	2 hours and 30 minutes
Item types	Matching, Fill in the blanks, Short Questions, CRQ
Learning Domain Addressed	Remembering, Understanding, Applying

## Review analysis of answer scripts of PECE 2018

Table 20 shows the matrix of PECE-2018 Bangladesh and Global Studies questions. Different eight sets of questions were administered in different regions across the country. A total number of 15 short questions, 14 fill in the blanks, 1 matching and 10 CRQs were given in the question paper and time duration for exam was 2 hours and 30 minutes. Options were given in Fill in the Blanks and CRQs; students had the opportunity to choose any 12 Fill in the blanks and any 8 CRQs. Learning sub-domain like- remembering, understanding and applying were addressed through those questions.

*Table 21: Overall Performance in BGS*

Questions	N		Allocated marks	Mean	SD
	Answered	Not answered			
1.SCRQ	160	0	30	25.14	5.79
2.Fill in the blanks	160	0	12	10.88	1.77
3.Matching	160	0	10	9.71	1.13
4.CRQ	159		48	31.98	11.05

There are four types of questions in Bangladesh and Global Studies which are as Short Constructed Response Question (SCRQ) in question-1, Fill in the blanks in question-2, Matching in question-3 and Constructed Response Question (CRQ) in question-4.

It is revealed from Table 21 that all students (160) answer SCRQ type item and the overall mean score is 25.14 where the allocated marks for this type of question is 30. The standard deviation for this item is 5.79.

Allocated mark for fill in the blanks is 12 and the overall mean score is 10.88 with 1.77 standard deviation. It is also seen that all students answer this question. Total allocated marks for matching is 10 and the average score achieved by the students is 9.71 with 1.13 standard deviation.

In CRQ type items, students of all regions got 31.98 marks out of 48 where the standard deviation is 11.05 which is relatively higher indicates more variations in performance.

*Table 22: Region-wise performance in SCRQ*

Regions	Allocated marks	Mean	SD
Chandpur	30	29.90	0.45
Chattogram	30	25.42	3.99
Cox's Bazar	30	28.20	2.59
Dhaka	30	20.53	6.96
Dinajpur	30	23.32	7.33
Gazipur	30	25.10	3.73
Mymensingh	30	21.16	6.83
Sylhet	30	27.30	3.80



## Review analysis of answer scripts of PECE 2018

Students were asked for answering 15 short constructed response questions (SCRQ) out of 15 and 2 marks are allocated for each SCRQ. Table 22 describes region-wise students' performance in SCRQ with the mean and standard deviation (SD) of their achieved marks.

It is found that out of 30 the highest average marks were obtained by the students of Chandpur region and their SD is also the lowest which indicates the lowest variations of performance among the students. Students of Cox's Bazar, Sylhet and Gazipur regions performed comparatively better while Dhaka, Mymensingh and Dinajpur regions showed relatively lower performance. It is also noticed that lower performed regions had higher SD indicating higher variation among the students.

*Table 23: Region-wise performance in fill in the blanks*

Questions	Allocated marks	Mean	SD
Chandpur	12	11.90	0.31
Chattogram	12	11.58	0.69
Cox's Bazar	12	11.35	0.88
Dhaka	12	8.63	3.20
Dinajpur	12	11.09	1.38
Gazipur	12	10.43	1.54
Mymensingh	12	11.11	1.29
Sylhet	12	10.90	1.37

In fill in the blanks, students have to write appropriate words in the blanks to given sentences. They had to answers 12 out of 14 fill in the blanks where each blanks bearing single marks. Table 23 illustrates the region-wise average and SD of achieved scores.

It is found that students of five regions (Chandpur, Chattogram, Cox's Bazar, Dinajpur and Mymensingh) scored an average of over 11 marks. Dhaka region showed the lowest performance in this question type and their SD is also relatively high (3.20) which also indicate more variations in students' performance in this region.

*Table 24: Region-wise performance in matching*

Questions	Allocated marks	Mean	SD
Chandpur	10	10.00	0.00
Chattogram	10	9.58	0.84
Cox's Bazar	10	10.00	0.00
Dhaka	10	9.32	1.25
Dinajpur	10	9.36	2.17
Gazipur	10	9.71	1.31
Mymensingh	10	10.00	0.00
Sylhet	10	9.70	0.98

## Review analysis of answer scripts of PECE 2018

The allocated marks for matching was 10 and students have to match 5 items from given items in two columns. It is noticeable from Table 24 that all students of Chandpur, Cox's Bazar and Mymensingh got full marks while students of other regions scored over an average of 9 marks. Dinajpur region has the highest SD of 2.17.

*Table 25: Region-wise overall performance in CRQ*

Questions	Allocated marks	Mean	SD
Chandpur	48	42.30	3.48
Chattogram	48	30.53	9.25
Cox's Bazar	48	32.70	8.03
Dhaka	48	30.16	11.09
Dinajpur	48	30.95	14.70
Gazipur	48	34.43	8.69
Mymensingh	48	25.79	10.61
Sylhet	48	28.45	12.23

Students have to answers eight (8) CRQ questions out of 10 questions where each question contains six (6) marks which makes a total of 48 marks. Table 25 gives the mean and SD of achieved marks according to the regions.

Students of Chandpur regions got the highest average marks (42.30) with SD 3.48 which is the lowest of all the regions. It is then depicting that students of Chandpur regions performed best and all the sample students had the lowest variation in performance.

*Table 26: Region-wise overall performance in BGS*

Regions	Allocated marks	Mean	SD
Chandpur	100	94.10	3.54
Chattogram	100	77.11	12.93
Cox's Bazar	100	82.25	8.35
Dhaka	100	68.63	16.90
Dinajpur	100	73.32	21.27
Gazipur	100	79.67	11.79
Mymensingh	100	68.05	16.61
Sylhet	100	76.35	16.07

Table 26 illustrates the overall performance in Bangladesh and Global Studies with mean and SD. It is revealed that Chandpur regions showed the best performance with average marks of about 94 and 3.54 SD. Beside Chandpur region, students of Cox's Bazar region showed better performance with an average of above 80% marks while their standard deviation is the second highest with 8.35.

## Review analysis of answer scripts of PECE 2018

Students of other regions who performed relatively better were the student of Gazipur (79.67), Chattogram (77.11) and Sylhet (76.35).

Dhaka and Mymensingh regions demonstrated the lowest performance bearing average marks about 68 with about 17 standard deviation that also indicated greater variation among the students. It is also discovered that though the students of Dinajpur regions got a relatively higher score than Dhaka and Mymensingh regions, their standard deviation is the highest (21.27) that signified the greater variations among the performance of the students of this region.

### 3.1.5 Elementary Science

#### General Features of the Elementary Science PECE 2018 Question

*Table 27: Matrix of Elementary Science Question*

Number of Total Items	Short Question-15, Fill in the Blanks-14, Matching-1, CRQs-10
Exam duration	2 hours and 30 minutes
Item types	Matching, Fill in the blanks, Short Questions, CRQ
Learning Domain Addressed	Remembering, Understanding, Applying

Table 27 depicts the matrix of PECE-2018 Elementary Science questions. Different eight sets of questions were administered in different regions across the country. A total number of 15 short questions, 14 fill in the blanks, 1 matching and 10 CRQs were given in the question paper and time duration for exam was 2hours and 30 minutes. Options were given in Fill in the Blanks and CRQs; students had the opportunity to choose any 12 Fill in the blanks and any 8 CRQs. Learning sub-domain like- remembering, understanding and applying were addressed through those questions.

*Table 28: Performance in Elementary Science*

Questions	N		Allocated marks	Mean	SD
	Answered	Not answered			
1.SCRQ	159	1	30	24.06	5.84
2.Fill in the blanks	160	0	12	9.88	2.36
3.Matching	159	1	10	9.52	1.38
4.CRQ	158	2	48	31.63	12.58

There are four types of questions in Elementary Science similar to Bangladesh and Global Studies which are as Short Constructed Response Question (SCRQ) in question-1, Fill in the blanks in question-2, Matching in question-3 and Constructed Response Question (CRQ) in question-4.

## Review analysis of answer scripts of PECE 2018

It is found from Table 28 that about all students (159) answers SCRQ type items and the overall mean score is 24.06 where the allocated marks for this type of question is 30. The standard deviation for this item is 5.84.

Allocated mark for fill in the blanks is 12 and the overall mean score is 9.88 with 2.36 standard deviation. It is also seen that all students answer this question.

All students except one answer the item matching where their mean score is 9.52 and standard deviation is 1.38 which is comparatively lower.

In CRQ items, among 160 sample students, 2 of them did not answer these items. It is seen that the mean score for CRQ type item is 31.63 with the standard deviation 12.58.

*Table 29: Region-wise performance in SCRQ*

Regions	N		Allocated marks	Mean	SD
	Answered	Not answered			
Chandpur	20	0	30	29.45	1.64
Chattogram	20	0	30	25.40	3.30
Cox's Bazar	20	0	30	28.15	2.62
Dhaka	20	0	30	25.10	4.95
Dinajpur	19	1	30	25.11	5.00
Gazipur	20	0	30	21.30	5.81
Mymensingh	20	0	30	21.95	5.13
Sylhet	20	0	30	16.10	4.77

In Elementary Science students have to answers 15 short SCRQ items out of 15 and 2 marks are allocated for each item. Table 29 describes region-wise students' performance in SCRQ with the mean and standard deviation (SD) of their achieved scores.

It is obtained from the data that the highest average marks were achieved by the students of Chandpur region (29.45 out of 30) and their SD is also the lowest (1.64) which indicates the minimum variations of performance among the students of that region.

Students of Cox's Bazar (28.15), Chattogram (25.40), Dhaka (25.10) and Dinajpur (25.11) regions performed comparatively better while Gazipur and Mymensingh regions showed relatively lower performance. On the contrary, Sylhet region scored the lowest marks (16.10) with a higher SD (4.77). It is also noticeable that lower performed regions had higher SD which indicates higher variations among the students.

*Table 30: Region-wise performance in fill in the blanks*

Regions	N		Allocated marks	Mean	SD
	Answered	Not answered			
Chandpur	20	0	12	11.90	0.45
Chattogram	20	0	12	11.10	0.79
Cox's Bazar	20	0	12	10.50	1.28
Dhaka	20	0	12	8.45	3.33
Dinajpur	20	0	12	10.90	1.80
Gazipur	20	0	12	8.60	2.37
Mymensingh	20	0	12	10.10	1.71
Sylhet	20	0	12	7.50	2.01

In fill in the blanks, students have to write appropriate words in the blanks to given sentences. They have to answers 12 out of 14 fill in the blanks where each blanks bearing single marks.

Table 30 illustrates the region-wise average and SD of achieved scores. It is revealed that students of Chandpur, Chattogram, Dinajpur and Cox's Bazar regions scored an average of about 11 marks where Mymensingh regions scored an average of just over 10 marks.

Students of Dhaka and Sylhet regions showed the lowest performance (8.45 and 7.50 respectively) in this question type and their SD is also relatively high (3.33 and 2.01 respectively) which also indicate more variations in students' performance in those regions.

*Table 31: Region-wise performance in matching*

Regions	N		Allocated marks	Mean	SD
	Answered	Not answered			
Chandpur	20	0	10	10.00	0.00
Chattogram	20	0	10	9.90	0.45
Cox's Bazar	19	1	10	10.00	0.00
Dhaka	20	0	10	8.70	2.36
Dinajpur	20	0	10	10.00	0.00
Gazipur	20	0	10	9.70	0.98
Mymensingh	20	0	10	10.00	0.00
Sylhet	20	0	10	7.90	2.10

The allocated marks for matching was 10 and students have to match 5 items from given items in two columns. It is noticeable from Table 31 that all students of Chandpur, Cox's Bazar, Dinajpur and Mymensingh got full marks. Besides, students of Chattogram region scored an average of 9.90 with a lower SD of 0.45.

On the other hand, students of Dhaka (8.70) and Sylhet (7.90) regions scored relatively lower average marks with higher SDs (2.36 and 2.10 respectively).

Table 32: Region-wise performance in CRQ

Regions	N		Allocated marks	Mean	SD
	Answered	Not answered			
Chandpur	20	0	48	41.25	7.83
Chattogram	20	0	48	39.80	5.03
Cox's Bazar	20	0	48	33.15	8.18
Dhaka	20	0	48	35.00	8.77
Dinajpur	18	2	48	35.83	10.25
Gazipur	20	0	48	26.15	13.80
Mymensingh	20	0	48	25.25	13.44
Sylhet	20	0	48	17.00	10.63

Table 32 gives the mean and SD of achieved marks according to the regions in CRQ type items.

Students of Chandpur regions got the highest average marks (41.25) with SD 7.83. It is then depicting that students of Chandpur regions performed best and all the sample students had the lowest variation in performance. Students of Chattagram region also performed better with an average score of 39.80.

Sylhet regions showed the lowest performance with the average score of 17 with 10.63 SD which is relatively higher. Gazipur and Mymensingh regions also bear displayed poorer performance having averages of 26.15 and 25.25 respectively.

Table 33: Region-wise overall performance in Elementary Science

Regions	Allocated marks	Mean	SD
Chandpur	100	92.60	9.37
Chattogram	100	86.20	7.82
Cox's Bazar	100	81.30	10.73
Dhaka	100	77.25	14.43
Dinajpur	100	77.00	20.93
Gazipur	100	65.75	20.80
Mymensingh	100	67.30	18.30
Sylhet	100	48.50	15.13

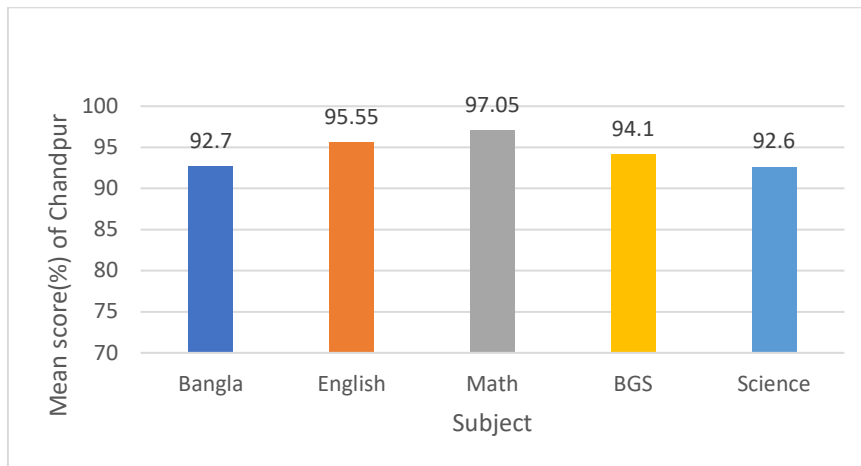
Table 33 illustrates the overall performance in Elementary Science with mean and SD. It is revealed that Chandpur regions showed the best performance with the average marks of about 93 with 9.37 SD. Besides the Chandpur region, students of Chattogram and Cox's Bazar regions showed better performance with averages of above 80% marks while their standard deviation is also comparatively lower. Students of Dhaka and Dinajpur regions have relatively better averages of about 77.

## Review analysis of answer scripts of PECE 2018

Sylhet region demonstrated the lowest performance bearing average marks about 48.50 with about 15.13 standard deviation that also indicated greater variation among the students. It is also mentionable that students of Gazipur and Mymensingh regions also showed comparatively lower performance with averages of 65.75 and 67.30 respectively.

### 3.2 REGION-WISE STUDENTS' PERFORMANCES

#### 3.2.1 Chandpur Region



*Figure 7: Students' Performances of Chandpur Region*

Figure 7 displays the students' performance of Chandpur region in each subject by giving the mean score. It is evident that the students got above 90% in all subjects and it indicated a high achievement. Moreover, in Mathematics they got a high score of about 97% marks and their lowest mark was 92.6% and that is in Science subject.

### 3.2.2 Chattogram Region

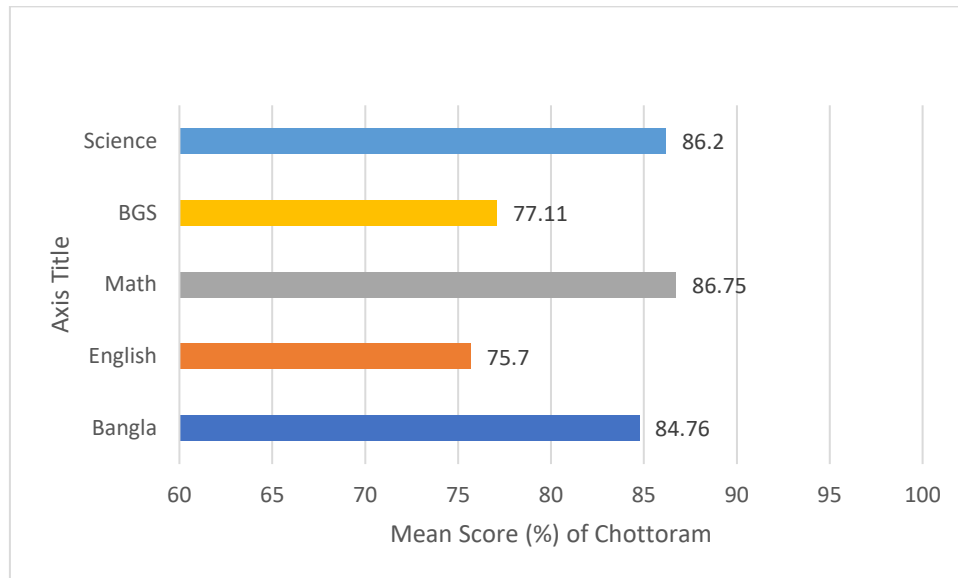


Figure 8: Students' Performances of Chattogram Region

Figure 8 portrays the students' performance of Chattogram region in each subject by their giving mean score. It is found that the students got above 75% in all subjects and it indicated a satisfactory result. Moreover, they got the highest marks in Mathematics about 87% marks and the lowest mark was 75.7% in English subject.

### 3.2.3 Cox's Bazar Region

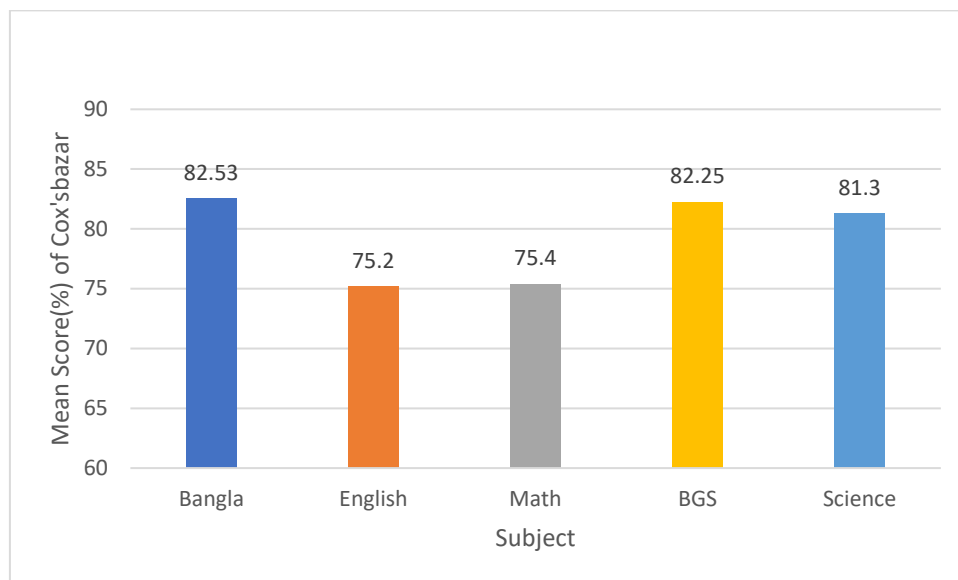


Figure 9: Students' Performances of Cox's Bazar Region

Figure 9 illustrates the students' performance of Cox's Bazar region in each subject by giving the mean score. It is derived that, the students got above 75% in all subjects and it indicated a satisfactory result. Moreover, they got the highest marks in Bangla about 83% marks and the lowest mark was 75.2% in English subject.



### 3.2.4 Dhaka Region

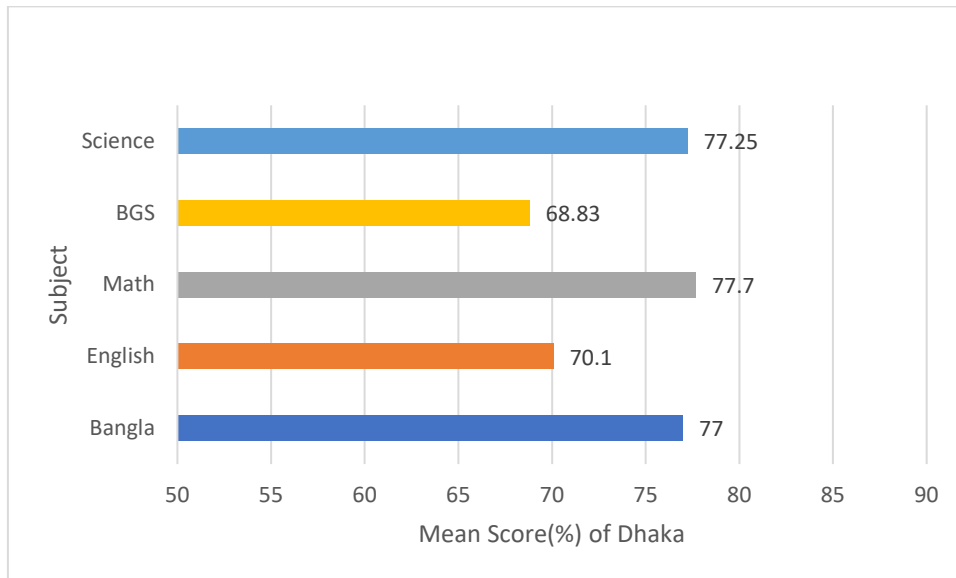


Figure 10: Students' Performances of Dhaka Region

Figure 10 shows the students' performance of Dhaka region in each subject by giving the mean score. It is observed that the students got above 68% in all subjects and it indicated a satisfactory performance. Besides, in Mathematics they got a high score of about 78% marks and their lowest mark was 68.83% and that is in Bangladesh and Global Studies subject.

### 3.2.5 Dinajpur Region

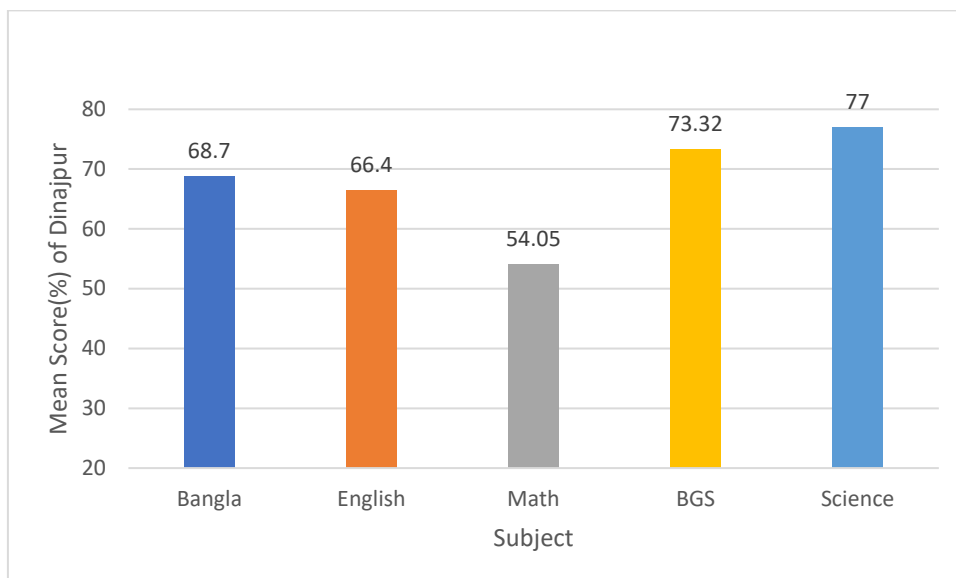


Figure 11: Students' Performances of Dinajpur Region

Figure 11 tells the students' performance of Dinajpur region in each subject by giving the mean score. It is derived that, the students got above 54% in all subjects and it indicated a low performance in all subjects. Besides, they got the highest marks in Science subject at 77% marks and the lowest mark was 54.05% in Mathematics subject.

### 3.2.6 Gazipur Region

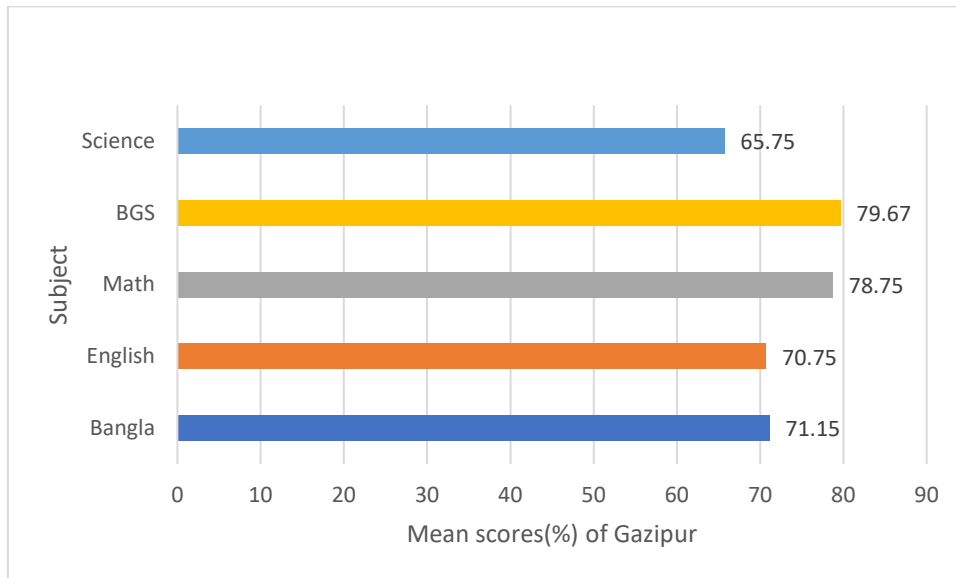


Figure 12: Students’ Performances of Gazipur Region

Figure 12 demonstrates the students’ performance of Gazipur region in each subject by giving the mean score. It is found that the students got above 65% in all subjects and it indicated an average performance. In addition, they got the highest marks in Bangladesh and Global Studies about 80% marks and the lowest mark was 65.75% in Science subject.

### 3.2.7 Mymensingh Region

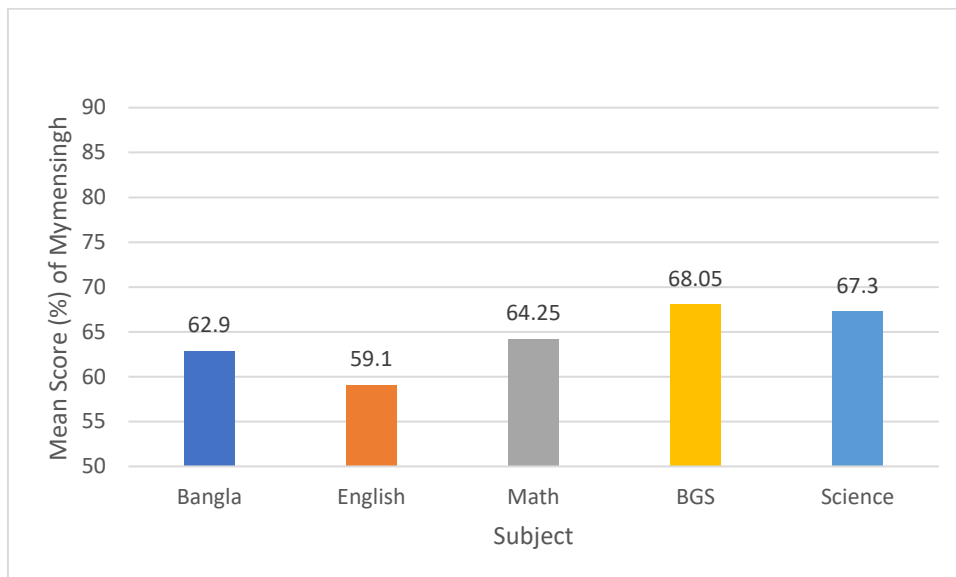


Figure 13: Students’ Performances of Mymensingh Region

Figure 13 illustrates the students’ performance of Mymensingh region in each subject by giving the mean score. It is found that the students got above 59% in all subjects and it indicated a low

## Review analysis of answer scripts of PECE 2018

performance in each subject. In addition, they got the highest marks in Bangladesh and Global Studies about 68% marks and the lowest mark was 59.1% in English subject.

### 3.2.8 Sylhet Region

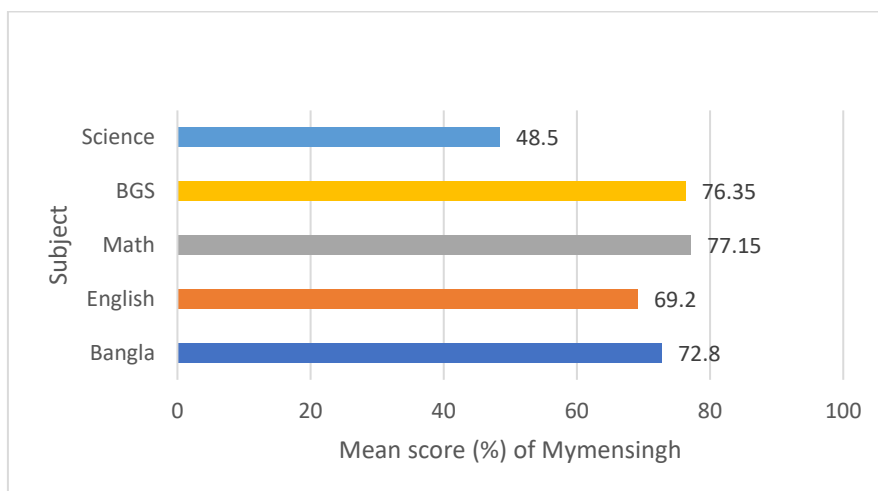


Figure 14: Students' Performances of Sylhet Region

Figure 14 portrays the students' performance of Sylhet region in each subject by giving the mean score. It is observed that the students got above 48% in all subjects and it indicated a low performance in each subject. Besides, they got the highest marks in Mathematics about 77% marks and the lowest mark was 48.5% in Science subject.

### 3.2.9 Overall students' performances in each subject

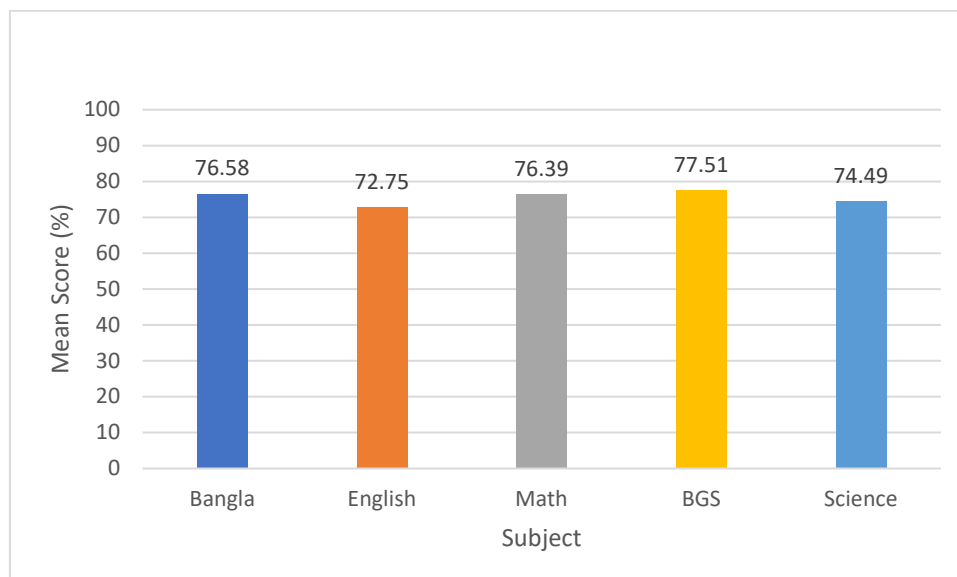


Figure 15: Students' Performances of all Regions in each Subject

Figure 15 represents the students' performance of all regions in each subject by giving the mean score. It is observed that the students of all regions got on an average about 73% to 78% marks in each subject; and it indicated satisfactory performance in each subject.

### **3.3 QUALITY OF MARKING**

Quality of marking describes the appropriateness of giving marks by the examiner. A score given by an examiner is called not appropriate when he/she put marks not following the instructions of marking scheme prepared and supplied by NAPE. After administering each subject in PECE, subject-wise marking scheme was prepared by a combination of subject specialists of NAPE and select expert teachers from the field.

There could be two types of inappropriate marking which are called under marking and over marking. A given score is called under marking when the examiner put marks on the answer script lower according to the instructions of marking scheme. Likewise, a given score is called over marking when the marks are higher according to the instructions of the marking scheme. There are also other types of inappropriateness in marking found such as errors in calculation of total number, mistakenly missed an answer for marking etc.

After analyzing the answer scripts by the subject specialists, it is found that inappropriate marking happened more or less in all subjects. In most of the cases, over marking was occurred in SCRQ and CRQ type test items which proved the lack of objectivity in these types of items. The incidence of lower marking happened comparatively lesser than over marking that revealed that examiner had a tendency for giving higher marking. There are two or more sub-questions in SCRQ and CRQ type questions in various subjects such as Bangla or Elementary Science. Individual mark distributions were given for the sub-questions so that examiners could asses them appropriately and gave marks individually. But it is found from the analysis that some of the examiners gave overall marks except for giving individual marks on sub-questions which is not a proper way of assessment and thus over marking or under marking occurs.

Examiners also did mistakes in calculating the total marks and this kind of incidences are few. Sometimes, they missed or forgot to put marks on one or more given answers which affect students' final results.

## 4 FINDINGS

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### 4.1 STUDENTS' PERFORMANCES IN DIFFERENT SUBJECTS

#### 4.1.1 Bangla

- All students responded all the items (word meaning and short questions) given in the seen texts, and the mean score of students' achievements indicated good performance (mean score was 11.84, out of 15) in seen text items, and the standard deviation in their achieving marks observed low.
- Most of the students responded all the items given in unseen text; and the mean score of students' achievements indicated good performance (mean score was 14.62, out of 20) in seen text items. The standard deviation of answering short questions was higher in comparison with the standard deviation of answering fill in the blanks.
- Most of the examinees responded to all the grammar-related items, and the mean score of students' achievements showed good performance (mean score was 29.18, out of 35) in grammar. Students exposed a good performance in synonym-antonym but their average performance in using punctuation marks was comparatively low.
- Some students did not respond to all the items given in seen poem, and the number of students was 31 who did not answer the third short question. Students' performance was observed satisfactory (mean score was 6.73, out of 10) in answering the three different questions given in the seen poem.
- Students' performance in writing letter or application was better in comparison with writing essay. Few numbers of students did not respond to the items given as creative writing.
- Overall, students' performance in remembering type questions was better in comparison with understanding and applying related questions. Students got on an average of around 85% in remembering type questions; whereas they got about 75% in understanding and about 73% in applying related questions.
- Overall, the students' performance of Mymensingh and Dinajpur regions was not up to the mark in Bangla and that was below 69%, on the contrary, the students' performance of Chandpur region was satisfactory and that was above 92%.

#### 4.1.2 English

- Most of the examinees responded all the items given in seen texts, and the mean score of students' achievements indicated an average performance (mean score was 22.41, out of 33)

in seen text items, and the standard deviation in their achieving marks observed high. Students' performances in writing short composition were low in comparison with other items in seen texts.

- Most of the examinees responded all the items given in unseen text, but few students did not respond short question and letter writing items, and the mean score of students' achievement indicated a satisfactory performance (mean score was 22.63, out of 31) in unseen text items. Students' performances in answering short questions were low in comparison with other items in unseen texts.
- The total mean score of students' achievements indicated satisfactory performance (mean score was 55.34, out of 50) in writing-related items. Students showed their good performances in answering rearrange and form fill up items. On the other hand, students' performance was observed below in composition writing in compare with other items of writing.
- Students showed an average performance in writing short composition and letter writing in terms of creative writing. But it is observed that students performed higher in letter writing (about 70%) than writing short composition (55%).
- Overall, students' performance in answering reading items (37.41) was a bit better than writing (35.34) items. Students writing score differences (standard deviation) was much higher than reading scores.
- Overall, the performance of students in Mymensingh region was not up to the mark and that is below 60%. On the contrary, the students' performance of Chandpur region was very good and that was above 95%.

#### **4.1.3 Mathematics**

- The students of Chandpur (19.85) and Chattogram (19.35) regions scored high in short questions in compared with other regions. On the contrary, the students of Dhaka (17.35), Dinajpur (17.80) and Gazipur (17.50) showed the least performances in short questions related items with a high range of standard deviation.
- Under the category of numbers and calculation related items, students' performance was satisfactory (mean score was about 7, out of 8) in Problem involving four rules, LCF & HCF and Average related competency-based items. On the other hand, in Percentage (mean score was 5.41, out of 8) and Fraction (mean score was 11.82, out of 16) related items students scored very low and few students did not attempt in the LCF & HCF, Fraction and Percentage related items.

## Review analysis of answer scripts of PECE 2018

- The students of Chandpur region got the highest marks (mean score was 47.15, out of 48) in number and calculation related items in compare with other regions; whereas, the students of Dinajpur region got the lowest marks (mean score was 22.05, out of 48) in that competency-based item. Besides, the standard deviation of Cox's Bazar indicates the gap between students' score was very high.
- In measurement related items, the students of Chandpur region got the highest marks (mean score was 12, out of 12) in comparison with other regions; whereas, the students of Dinajpur region got the lowest marks (mean score was 5.35, out of 12) in that competency-based item.
- In geometry related questions, the students of Chandpur region got the highest marks (mean score was 10.35, out of 12) in comparison with other regions; whereas, the students of Dinajpur region got the lowest marks (mean score was 8.32, out of 12) in geometry. It is noted that the students of Mymensingh region performed better in geometry items than other competency-based items.
- In statistics related item, the students of Chandpur region got the highest marks (mean score was 7.70, out of 8) in comparison with other regions; whereas, the students of Dinajpur region got very poor marks (mean score was 5, out of 8) in statistics with a high range of standard deviation.
- Overall, the performance of students of Dinajpur region was not up to the mark in mathematics and that was below 55%; on the contrary, the students' performance of Chandpur region was high and that was above 97%.

### 4.1.4 Bangladesh and Global Studies

- All students (160) answers SCRQ type item and the overall mean score is 25.14 where the allocated marks for this type of question is 30. It is found that the highest average marks were obtained by the students of Chandpur region (29.90) while Dhaka, Mymensingh and Dinajpur regions showed relatively poorer performance. It is also noticed that lower performed regions had higher SD indicating higher variation among the students.
- Allocated mark for fill in the blanks is 12 and the overall mean score is 10.88 with 1.77 standard deviation. It is found that students of five regions (Chandpur, Chattogram, Cox's Bazar, Dinajpur and Mymensingh) scored an average of over 11 marks. Dhaka region showed the lowest performance in this question type.
- Total allocated marks for matching is 10 and the average score achieved by the students is 9.71. All students of Chandpur, Cox's Bazar and Mymensingh got full marks while students of other regions scored over an average of 9 marks.

## Review analysis of answer scripts of PECE 2018

- In CRQ type items, students of all regions got an average of 31.98 marks out of 48. Students of Chandpur regions got the highest average marks (42.30) while Mymensingh regions showed the lowest average of about 25.
- Overall, Chandpur regions showed the best performance with average marks of about 94. Students of Cox's Bazar region showed a better performance with an average of above 80% marks. Dhaka and Mymensingh regions demonstrated the lowest performance bearing average marks about 68. It is also discovered that though the students of Dinajpur regions got a relatively higher score than Dhaka and Mymensingh regions, their standard deviation is the highest (21.27) that signified the greater variations among the performance of the students in this region.

### 4.1.5 Elementary Science

- The highest average marks in SCRQ were achieved by the students of Chandpur region (29.45 out of 30) whereas Sylhet region scored the lowest marks (16.10). It is also noticeable that lower performed regions had higher SD which indicates higher variations among the students.
- In fill in the blanks, students of Chandpur, Chattogram, Dinajpur and Cox's Bazar regions scored an average of about 11 marks where students of Dhaka and Sylhet regions showed the lowest performance (8.45 and 7.50 respectively).
- The allocated marks for matching was 10 and all students of Chandpur, Cox's Bazar, Dinajpur and Mymensingh got full marks. On the other hand, students of Dhaka (8.70) and Sylhet (7.90) regions scored relatively lower average marks.
- Students of Chandpur regions got the highest average marks (41.25) with SD 7.83 in CRQ type questions whereas Sylhet regions showed the lowest performance with the average score of 17 with 10.63 SD which is relatively higher.
- Overall, Chandpur region showed the best performance with the average marks of about 93 with 9.37 SD. Students of Chattogram and Cox's Bazar regions showed better performance with averages of above 80% marks. Sylhet region demonstrated the lowest performance bearing average marks about 48.50 with about 15.13 standard deviation that also indicated greater variation among the students. It is also mentionable that students of Gazipur and Mymensingh regions also showed comparatively lower performance with averages of 65.75 and 67.30 respectively.



## **4.2 REGION-WISE STUDENTS' PERFORMANCES**

- The students of Chandpur region got above 90% in all subjects and it indicated a high achievement. They got a high score of about 97% marks in Mathematics and their lowest mark was 92.6% and that is in Science subject.
- The students of Chattogram region got above 75% in all subjects and it indicated a satisfactory result. They got the highest marks in Mathematics about 87% marks and the lowest mark was 75.7% in English subject.
- The students of Cox's Bazar region got above 75% in all subjects and it indicated a satisfactory result. They got the highest marks in Bangla about 83% marks and the lowest mark was 75.2% in English subject.
- The students of Dhaka region got above 68% in all subjects and it indicated a satisfactory performance. In Mathematics, they got a high score of about 78% marks and their lowest mark was 68.83% and that is in Bangladesh and Global Studies subject.
- The students of Dinajpur region got above 54% in all subjects and it indicated a low performance in all subjects. Besides, they got the highest marks in Science subject at 77% marks and the lowest mark was 54.05% in Mathematics subject.
- The students of Gazipur region got above 65% in all subjects and it indicated an average performance. In addition, they got the highest marks in Bangladesh and Global Studies about 80% marks and the lowest mark was 65.75% in Science subject.
- The students of Mymensingh region got above 59% in all subjects and it indicated a low performance in each subject. Besides, they got the highest marks in Bangladesh and Global Studies about 68% marks and the lowest mark was 59.1% in English subject.
- The students of Sylhet region got above 48% in all subjects and it indicated a low performance in each subject. Besides, they got the highest marks in Mathematics about 77% marks and the lowest mark was 48.5% in Science subject.
- It is observed that the students of all regions got on an average about 73% to 78% marks in each subject; and it indicated satisfactory performance in each subject.

## **4.3 QUALITY OF MARKING**

- It is found that inappropriate marking happened more or less in all subjects. In most of the cases, over marking was occurred in SCRQ and CRQ type test items. The incidence of lower marking happened comparatively lesser than over marking that revealed that examiner had a tendency for giving higher marking.

## Review analysis of answer scripts of PECE 2018

- It is also found from the analysis that some of the examiners gave overall marks except for giving individual marks on sub-questions which is not a proper way of assessment and thus over marking or under marking occurs.
- Examiners also did mistakes in calculating the total marks and this kind of incidences are few.
- Sometimes, examiner missed or forgot to put marks on one or more given answers which affect students' final results.

## 5 RECOMMENDATIONS

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The study team has conducted this simple analysis for PECE 2018 by reviewing 160 students' answer scripts from 8 different regions. However, the findings could not be differentiated between the regions because for different items as well as different texts were used in different regions. However, the researcher made the following recommendations by surmising the facts.

- Classroom teaching should have improved especially in English and Mathematics subjects. As students' weaknesses were found in answering short questions and composition writing in English; and they also faced problem in doing problem-solving mathematics. These should have addressed in classroom teaching.
- Provide opportunities for students to practice answering questions in each subject through competency-based items. In school level, teachers need to prepare competency-based items and orient the students about these test items. In that case, training and motivation is needed for school teachers to develop question paper for the terminal and annual examinations by themselves. By doing so, students will feel confident to answer competency-based items in real exam like PECE.
- Training should have arranged in field level on Test Item Development and Marking Students' Answer Scripts to develop the professional capacity of teachers. Few incongruities were observed in marking answer scripts, those issues could be solved if the teachers are trained on this matter.
- It needs to allocate sufficient time for markers to assess the students' answer scripts appropriately. Time limitation could be a factor in under marking and over marking.
- Out of eight regions, the students of Dinajpur and Mymensingh regions were not able to show satisfactory performance in all subjects. So, it needs to give proper attention to teaching-learning practices and school monitoring in those regions.

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## ANNEX-A

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### Study Team for Preparing the Report

Sl. No.	Name	Designation
1.	Mr. Md. Shah Alam	Director General (Joint Secretary)
2.	Mr. Md. Yousof Ali	Director (Deputy Secretary)
3.	Mr. Md. Mahbub Elahi	Senior Specialist, NAPE
4.	Ms. Dilruba Ahmed	Deputy Director (Admin)
5.	Mr. Md. Zahurul Haque	Specialist, NAPE
6.	Mr. Mohammad Aminul Haque	Assistant Specialist, NAPE
7.	Mr. Md. Mazharul Haque	Assistant Specialist, NAPE
8.	Mr Md. Mazaharul Islam Khan	Assistant Specialist, NAPE
9.	Mr. Md. Abu Bakar Siddik	Assistant Specialist, NAPE
10.	Mr. Md. Saiful Islam	Assistant Specialist, NAPE

## ANNEX-B

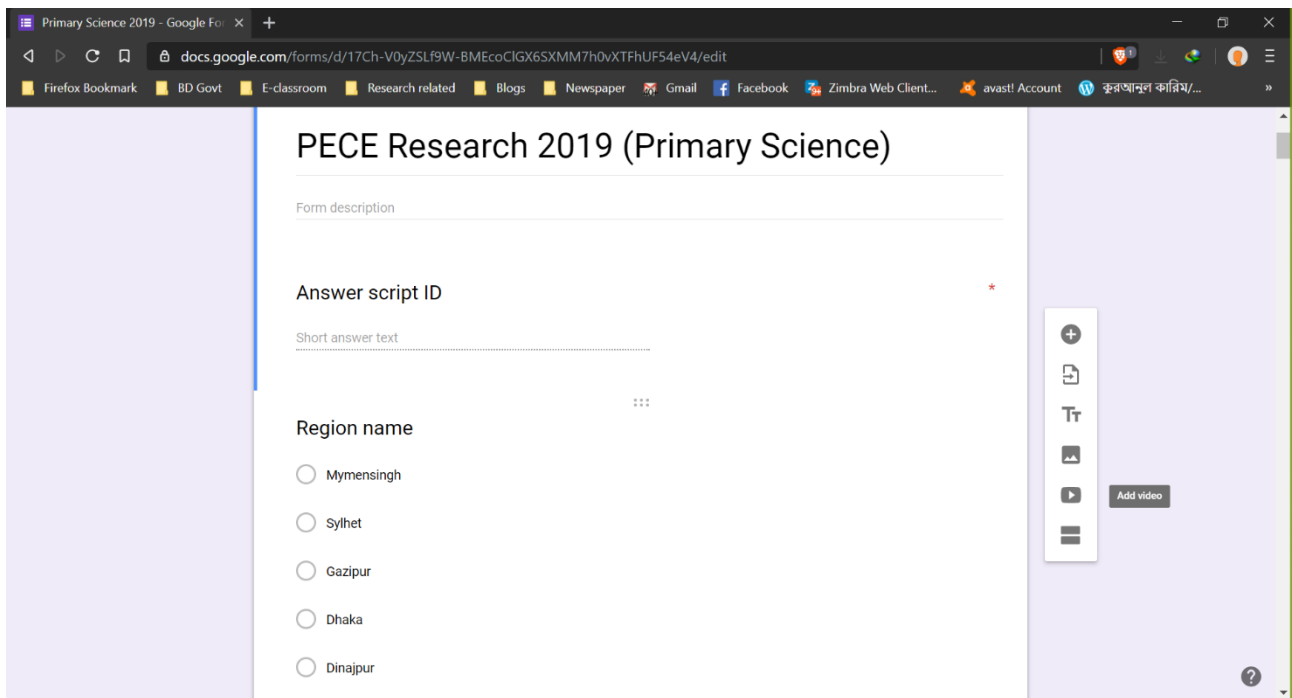


Figure A 1: Sample of online data entry platform

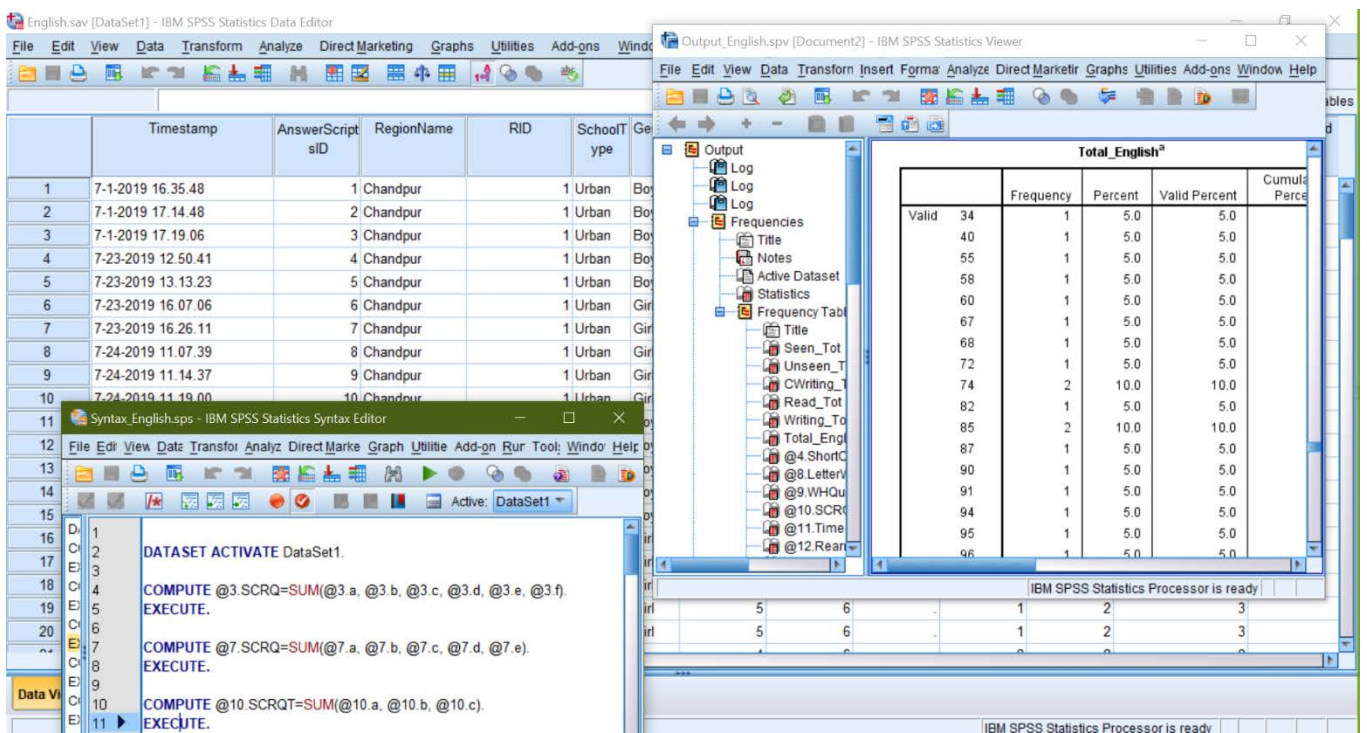


Figure A 2: Sample view of SPSS data, syntax and output files