GRADE VI
CBAT 2018

Year-end Assessment Report 2019
Bhutan Council for School Examinations and Assessment

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FOREWORD

The Assessment and Monitoring Division (AMD) under Bhutan Council for School Examinations and Assessment (BCSEA) is mandated to conduct Competency Based Assessment Test (CBAT) annually for grades III and VI with an objective to assess competencies of students in various subjects. Apart from conducting CBAT-III and VI, AMD also conducts large scale assessments such National Education Assessment (NEA) at various age and grade levels to gauge the learning outcomes of students in fundamental subjects. In 2017, AMD administered Programme for International Student Assessment for Development (PISA-D) and successfully launched its report on 29th March 2019.

Since the introduction of CBAT in 2014, AMD has been analyzing CBAT-VI results and publishing the reports to enhance students' learning outcomes at upper primary exit level by providing authentic information to the stakeholders.

This CBAT-VI 2019 Report presents students' academic achievement in 2018 across five subjects: Dzongkha, English, Mathematics, Science and Social Studies along with the performance trend over the last three years (2016-2018). One new feature added to this report is the discrepancy in scores between the Central and School level evaluation.

I would like to commend the Dzongkhag Education Officers (DEOs), Thromde Education Officers (TEOs), principals, teachers and students for their support and participation.

Jamyang Choeden
Director
Bhutan Council for School Examinations and Assessment

LIST OF ABBREVIATIONS

AMD	Assessment and Monitoring Division
BCSEA	Bhutan Council for School Examinations and Assessment
CBA	Competency Based Assessment
CBAT	Competency Based Assessment Testing
DEO	Dzongkhag Education Officer
CS	Central School
TEO	Thromde Education Officer
D	Difficult
HSS	Higher Secondary School
LSS	Lower Secondary School
MoE	Ministry of Education
MSS	Middle Secondary School
NEA	National Education Assessment
PISA-D	Programme for International Student Assessment for Development
PS	Primary School
Pub	Public
Pvt.	Private
R	Remote
REC	Royal Education Council
SPSS	Statistical Package for the Social Sciences
SR	Semi-remote
SU	Semi-urban
U	Urban
VR	Very remote

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EXECUTIVE SUMMARY

With an intent to enhance the individual student learning competencies at various key stages, BCSEA introduced CBAT from 2014. Since then BCSEA has been analyzing CBAT data for various purposes over the years. The CBAT-VI 2019 Report presents the findings of students' achievement and the performance trend across the subjects (Dzongkha, English, Mathematics, Science and Social Studies). The report covers parameters such as Dzongkhag and Thromde schools, school location, school type, school level, gender and discrepancy in scores between school level and central level evaluation.

In 2018, a total of 12,950 from 219 schools under 20 Dzongkhags and 4 Thromdes registered for CBAT-VI, out of which, 1097 sample students' raw marks achieved in BCSEA's CBAT-VI 2018 were collected for analysis.

The main purposes of this study were to:

1. gauge the learning outcomes of students in subjects taught at grade VI (Dzongkha, English and Mathematics, Science and Social Studies);
2. establish baseline of students' academic achievement across the subjects;
3. provide authentic feedback to the stakeholders on students' performance in CBAT-VI 2018 for policy interventions;
4. find out if there was any discrepancy in scores between central and school level evaluation; and
5. study the performance trend of grade VI students in CBAT (2016, 2017 and 2018).

The key research questions for this study were as follows:

1. What is the learning outcome of students at grade VI in 2018?
2. What is the baseline mean score for each subject?
3. What is the performance of students studying in Dzongkhags and Thromde, various school types, school levels, school locations etc.?
4. Is there any discrepancy in scores between central and school level evaluation?
5. How is the performance of male and female students?
6. How is the students' performance trend in CBAT-VI from 2016 to 2018?

A total of 12,950 students from 405 schools across 20 Dzongkhags and 4 Thromdes appeared for grade VI CBAT in 2018, out of which 1097 students' data from 219 schools were collected for analysis. Of the 1097 students, 1066 students were from public schools and 31 students were from private schools. A total of 519 were male while 578 were female.

The schools located in rural (R) had the highest representation with 306 students followed by schools in urban (U) with 228 students and the least was from schools located in semi-urban (SU) with 62 students. Trashigang had the maximum representation of population (97) consisting of 19 sample schools followed by Samtse (83) consisting of 16 sample schools and the least was from Samdrup Jongkhar Thromde (5 students) with just 1 sample school.

Of the various levels of schools, Primary School (PS) had the largest student population of 577 followed by Lower Secondary School (LSS) with 195 students while the least number of students was from Higher Secondary School (HSS) with just 26 students.

Findings

1. The overall students' performance was highest in Science with a mean score of 61.35 followed by Dzongkha (55.48) and Social Studies (54.47) respectively.
2. Female students performed slightly better than the male students across all subjects except in Mathematics. The mean scores were 58.08 (female) and 52.58 (male) in Dzongkha, 48.09 (female) and 45.49 (male) in English, 42.99 (female) and 43.71 (male) in Mathematics, 61.49 (female) and 61.20 (male) in Science and 54.71 (female) and 54.20 (male) in Social Studies.
3. The students in Tashiyangtse topped in Dzongkha (62.14) and Thimphu Thromde topped in English (57.57), Gelephu Thromde topped both in Mathematics (53.05) and Social Studies (68.50) while Samdrup Jongkhar Thromde topped in Science (68.00).
4. Students of very remote (VR) location outperformed in Dzongkha (60.28) while students in urban (U) location outperformed in English (50.08). The students in semi-urban (SU) location performed better in Mathematics (46.59), while the students in difficult (D) location outperformed both in Science (65.01) and Social Studies (57.50).
5. Students in private schools outperformed the students in public schools across all the subjects.
6. Students in Primary Schools (PS) topped in Dzongkha (59.01), Science (63.37) and Social Studies (57.37), while Higher Secondary Schools (HSS) topped in English (50.37) and Mathematics (46.98).
7. Over the years the performance of students across all subjects showed inconsistency when considering the central level evaluation. However, the performance in Mathematics, Science and Social Studies in 2018 was better than their baseline mean scores in 2016.
8. Over the years, the performance of students across all subjects indicated inconsistency except in Social Studies while considering the school level evaluation. The performance in Social Studies had been progressive over the years. However, there had been a significant improvement in all subjects in 2018 when compared to their baseline mean scores in 2016.

9. Though there was slight improvement in Mathematics performance in 2018 compared to its baseline mean score in 2016, the performance over the years in Mathematics had been the lowest amongst all subjects.
10. There was a huge discrepancy in scores between school level and central level evaluation, especially in English and Dzongkha.

CHAPTER 1: INTRODUCTION

1.1 Background

In alignment with the recommendation from McKinsey Project Compact for 2010–2013, Competency Based Assessment was introduced in Bhutan through CBAT-III and VI year-end assessment conducted by BCSEA.

Though the question papers for CBAT-VI are developed by BCSEA, the test administration and evaluation are being done by the respective schools as an integral part of school-based assessment. The question papers are set on 100 marks each and the corresponding weightages accorded by Royal Education Council (REC) are: 25% in English, 25% in Dzongkha, 40% in Mathematics and 30% each in Science and Social Studies. These weightages are added to the continuous assessment (CA) marks for students' promotion at the end of the academic year. BCSEA has been generating reports on the performance of grade VI students based on the raw marks obtained in their CBAT since 2015, and the findings are accordingly disseminated to the stakeholders and published on the agency's website (www.bcsea.bt).

1.2 Main purpose of the study

The main purposes of this study were to:

1. gauge the learning outcomes of students in subjects taught at grade VI (Dzongkha, English and Mathematics, Science and Social Studies);
2. establish baseline of students' academic achievement across the subjects;
3. provide authentic feedback to the stakeholders on students' performance in CBAT-VI 2018 for policy interventions;
4. find out if there was any discrepancy in scores between central and school level evaluation; and
5. study the performance trend of grade VI students in CBAT (2016, 2017 and 2018).

The key research questions for this study were as follows:

1. What is the learning outcome of students at grade VI in 2018?
2. What is the baseline mean score for each subject?
3. What is the performance of students studying in Dzongkhags and Thromde, various school types, school levels, school locations etc.?
4. Is there any discrepancy in scores between central and school level evaluation?
5. How is the performance of male and female students?
6. How is the students' performance trend in CBAT-VI from 2016 to 2018?

1.3 Significance of the study

The study aims to determine grade VI students' learning outcomes alongside the performance trend of grade VI over the years (2016-2018). It is also intended to provide feedback on the current evaluation practices in schools.

CHAPTER 2: METHODOLOGY

This chapter presents the research methods and procedures used in the study for CBAT-VI result analysis across five subjects (Dzongkha, English, Mathematics, Science and Social Studies). It specifies the procedures followed in sequence such as test instrument development, test instrument moderation, data collection, data entry, data cleaning and analysis and report writing.

2.1 Sampling

The sample design adopted for the study is a stratified two-stage cluster sample design. This allowed the use of sample design table (Ross, 1987) to provide estimates of the number of schools and students required to obtain a sample with an "effective sample size" (Kish, 1965:259) of 400.

Expression used to estimate primary and secondary sampling units in the two-stage cluster sample is:

$$a = \frac{400}{b} \times (1 + (b - 1)roh)$$

where:

a = number of primary sampling units (schools),

b = number of secondary sampling units (students) and

rho = coefficient of intraclass correlation.

In this study the cluster size of 5 was selected as this represented a manageable cluster size for data collection within any single school. The value of the co-efficient of intra-class correlation for Competency Based Assessment for Classes III and VI in 2017 was around 0.3. From the sample design tables in Annexure 35, it may be seen that, in order to obtain a two-stage cluster sample with an effective sample size of 400, it is necessary to select a sample of 176 schools – which results in a total sample size of 880 students for roh value of 0.3. However, for this study a sample size of 224 schools was used so that the number of schools could be proportionately allocated across strata.

Probability of selection is given by

$$Probability = S_h \times \left(\frac{N_{hi}}{N_h}\right) \times \left(\frac{n_{hi}}{n_h}\right)$$
$$= \frac{S_h \times n_{hi}}{N_h}$$

where:

S_h = the number of schools selected in stratum h,

N_h = the total number of students in stratum h,

N_{hi} = the total number of students in school i in stratum h, and

n_{hi} = the number of students selected from school i.

Excluded population in the sample frame includes; schools with less than 5 class VI students, special schools and all non-Bhutanese students.

A total of 1112 students' data from 219 sample schools were considered for the actual study.

2.2 Test instrument development

CBAT-VI test blueprint, test instruments, model answers and marking schemes were developed under the guidance of BCSEA officials based on the input and expertise from the subject teachers of various schools. The test instruments were developed as classified in the Bloom's Taxonomy that catered to different cognitive abilities of the students. It also comprised of variety of formats including closed constructed response and open constructed response covering all the requirements as outlined in the curriculum framework and mode of assessment prescribed by REC and BCSEA.

The assessment question papers were set on 100 marks with a writing time of 2 hour and 15 minutes. The question paper consisted of 50% traditional items and 50% competency-based items.

Traditional items measure students' lower order cognitive abilities such as recalling of facts and figures, procedural knowledge and basic conceptual understanding of the curriculum content rather than their capacity to process and use facts and figures in different contexts.

Competency based items demand students to use and apply knowledge, soft skills and attitudinal attributes that they have acquired through learning processes into various contexts of their everyday life.

2.3 Dzongkha and English

The CBAT Dzongkha and English for grade VI were assessed on the following three strands:

1. Writing

2. Grammar
3. Reading

2.4 Mathematics

Grade VI CBAT Mathematics was assessed on the following four strands:

1. Number and relationship
2. Patterns and operations
3. Measurement and geometry
4. Data and probability

These categories of learning topics characterize the range of mathematical content central to its discipline and illustrate the broad areas that guide the development of the test instruments.

2.5 Science

CBAT-VI Science was assessed on two dimensions:

I. Content dimension covering the following twelve (12) chapters:
   1. Elements, acids and alkalis
   2. Chemical change
   3. Separating mixture
   4. Mass and weight
   5. Light and sound
   6. Electricity and magnetism
   7. Living things and their environment
   8. Green plants
   9. Classification of animals
   10. Diet and human system
   11. Work and energy
   12. Earth, Moon and the Sun

II. Cognitive dimension encompassing the range of cognitive processes involved in learning science concepts as per Bloom's Taxonomy.

2.6 Social Studies

Grade VI CBAT Social Studies was assessed on two dimensions:

I. Content dimension covering the following three (3) units:
   1. The environment
   2. People and places
   3. Society

II. Cognitive dimension encompassing the range of cognitive processes involved in learning concepts of Social Studies as per Bloom's Taxonomy.

2.7 Test administration and evaluation

CBAT-VI was administered across all schools in the country from 19th – 24th November 2018 as per BCSEA's timetable. The answer scripts were evaluated in the respective schools based on the marking scheme and model answers provided by BCSEA.

2.8 Re-evaluation of the answer scripts

The CBAT-VI answer scripts of the sample students across the country were collected and re-evaluated as per the marking scheme and model answers developed by BCSEA which was further standardized by the teachers during the Central Level Evaluation Programme held at College of Science and Technology (CST), Rinchhending, Phuentsholing Thromde from 20th – 30th January 2019.

2.9 Data format

The data analysis was carried out based on the raw marks of the sample students secured in central level evaluation of the CBAT-VI 2018. A standard data punching format was used in securing the data for analysis. The data cleaning and analysis was done using Excel and SPSS software.

2.10 Limitations

The performance trend of students in Gelephu Thromde could not be studied as their CBAT-VI data for 2017 was not submitted to BCSEA.

2.11 Demographic information

A total of 12,950 students from 405 schools across 20 Dzongkhags and 4 Thromdes appeared for grade VI CBAT in 2018, out of which 1097 students' data from 219 schools were collected for analysis. Of the 1097 students, 1066 students were from public schools and 31 students were from private schools. A total of 519 were male while 578 were female.

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Of the various levels of schools, Primary School (PS) had the largest student population of 577 followed by Lower Secondary School (LSS) with 195 students while the least number of students was from Higher Secondary School (HSS) with just 26 students.

CHAPTER 3: MAJOR FINDINGS

3.1 Overall performance of students

Based on the mean scores obtained by students in the grade VI CBAT, the highest mean score secured was in Science (61.35) followed by Dzongkha (55.48) and Social Studies (54.47).

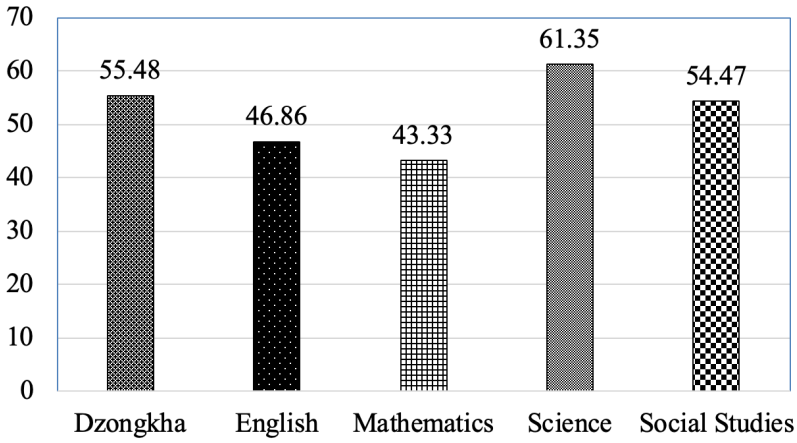


Figure 1: Overall performance of students across five subjects

3.1.1 Performance of students across Dzongkhags and Thromdes

Students in Trashiyangtse secured the highest mean score in Dzongkha (62.14) followed closely by the students of Trashigang (61.76), while the students of Gelephu Thromde secured the least (43.00).

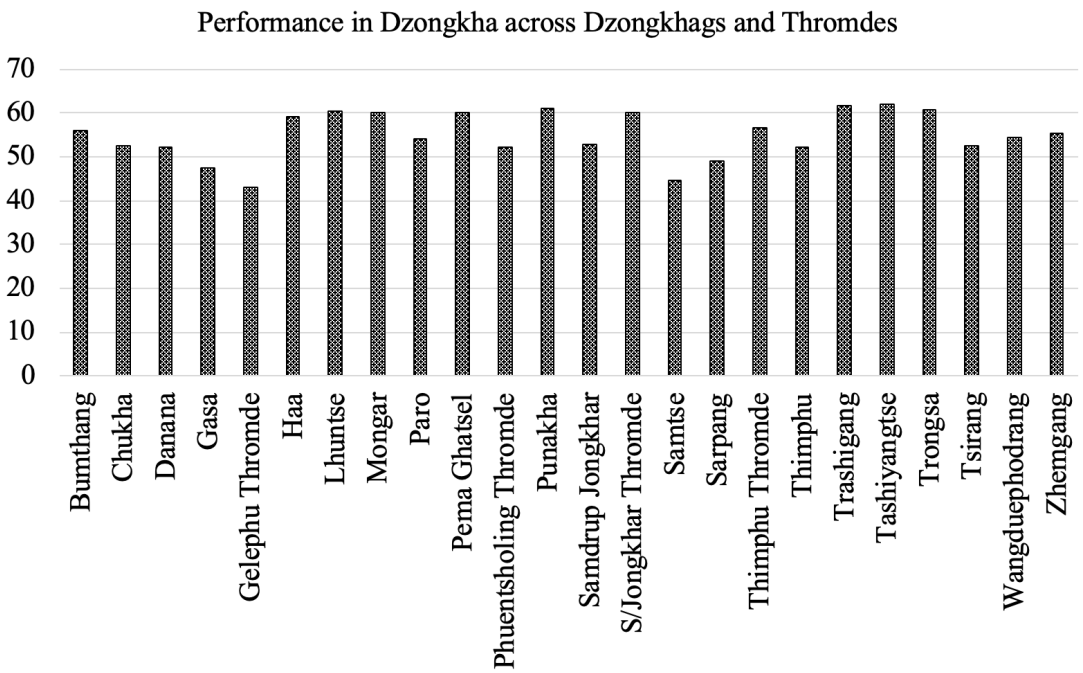


Figure 2: Performance in Dzongkha across Dzongkhags and Thromdes

In English, the students of Thimphu Thromde secured the highest mean score (57.57) followed by Haa (52.33). The least mean score was secured by the students of Sarpang (42.72).

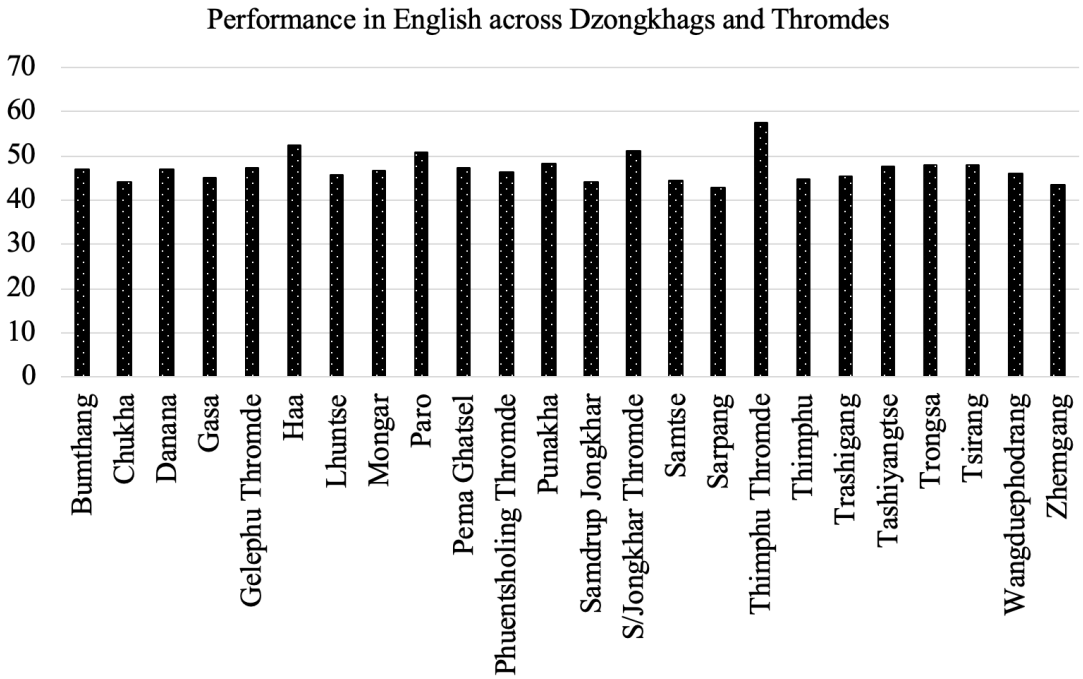


Figure 3: Performance in English across Dzongkhags and Thromdes

The students of Gelephu Thromde performed better in Mathematics with the mean scores of 53.05 followed by Thimphu Thromde with 51.16 while the students' performance of Chukha was the lowest (38.40).

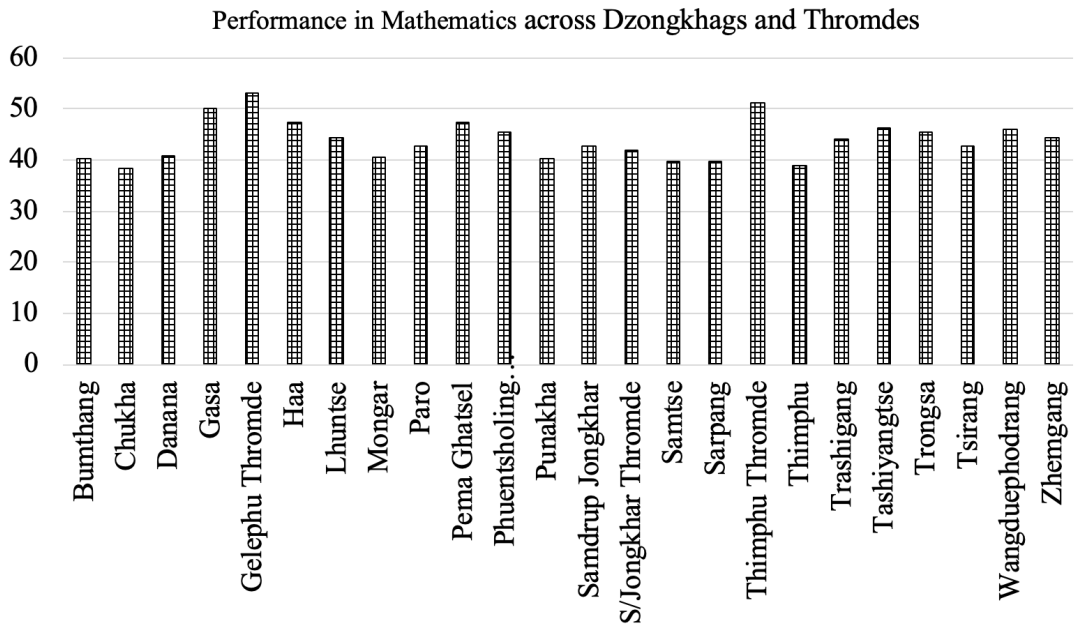


Figure 4: Performance in Mathematics across Dzongkhags and Thromdes

Students of Samdrup Jongkhar Thromde secured the highest mean score in Science (68.00) followed by the students of Gelephu Thromde (66.20), while the students of Thimphu Dzongkhag secured the least (56.26).

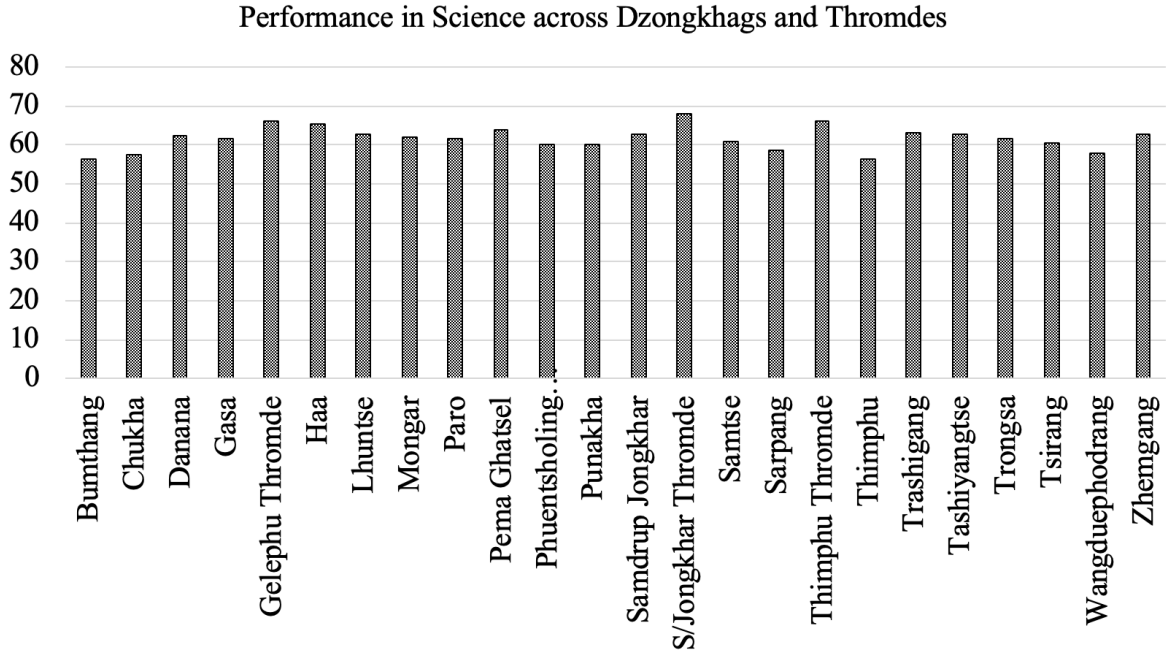


Figure 5: Performance in Science across Dzongkhags and Thromdes

Students of Gelephu Thromde secured the highest mean score in Social Studies (68.50) followed by the students of Thimphu Thromde (61.36), while the students of Sarpang secured the least (48.48).

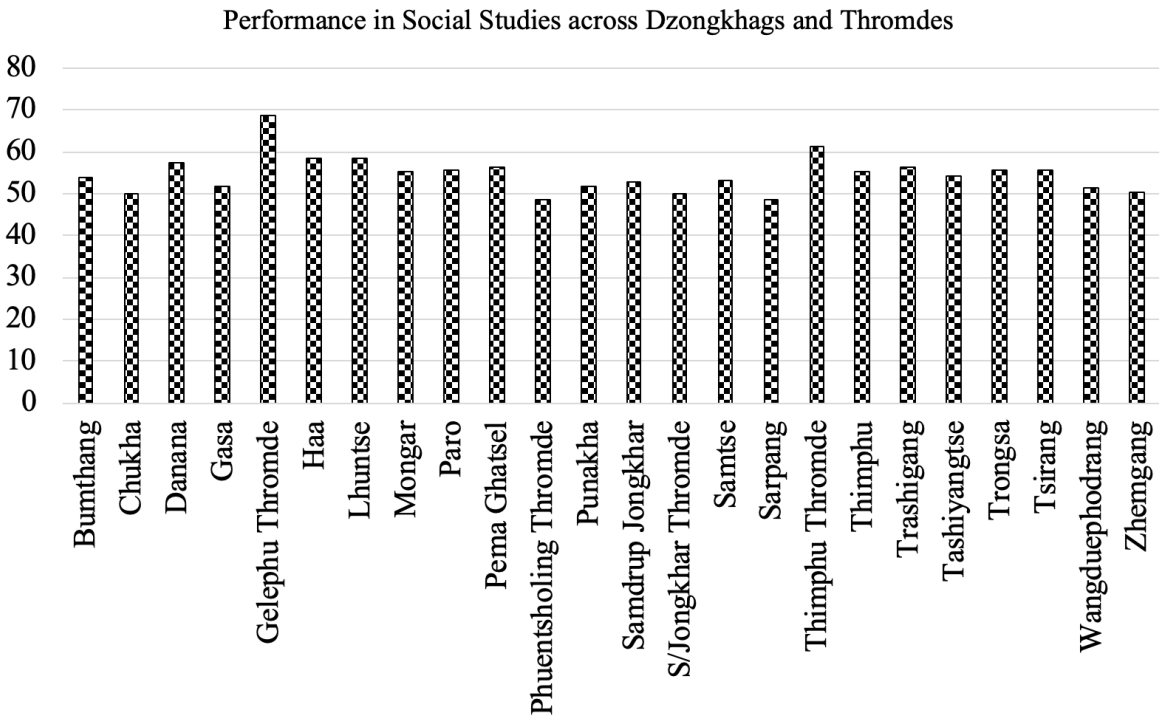


Figure 6: Performance in Social Studies across Dzongkhags and Thromdes

3.1.2 Performance of students in various school locations

The students in very remote location outperformed in Dzongkha (60.28) followed by students in remote (56.21) and difficult (56.16) while the students of semi-urban location performed the lowest (51.38).

In English, students in urban location scored the highest mean score (50.08) followed by the students studying in schools located in difficult (47.37) while rest of the students in four locations performed almost at par.

The students in semi-urban location performed slightly better in Mathematics (46.59) followed by the students studying in urban (44.54) and difficult (44.02) while the students in semi-remote location had the least (40.52).

The students in difficult location performed better in Science (65.01) followed by students in very remote (63.62) while the students in semi-remote had the least (58.46).

Similarly, the students in difficult location performed better in Social Studies (57.50) followed by students in urban (55.75) while the students in semi-urban had the least (51.50).

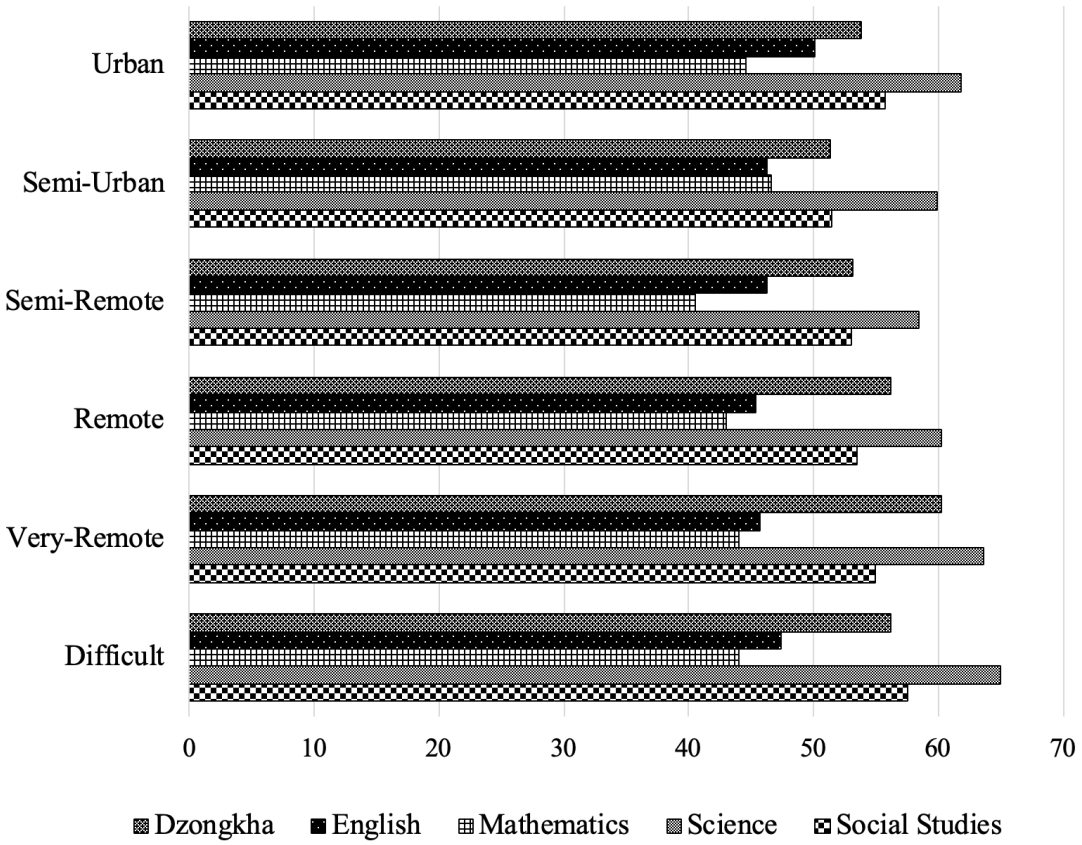


Figure 7: Performance of students in various location of schools

3.1.3 Performance of students in public and private schools

The students in private schools outperformed the students in public schools across all the subjects. The mean scores achieved in Dzongkha, English and Mathematics, Science and Social Studies by the students in private schools were 61.65, 63.32, 60.50, 75.37 and 69.60 respectively while the students in public schools achieved mean scores of 55.30, 46.38, 42.83, 60.94 and 54.03 respectively.

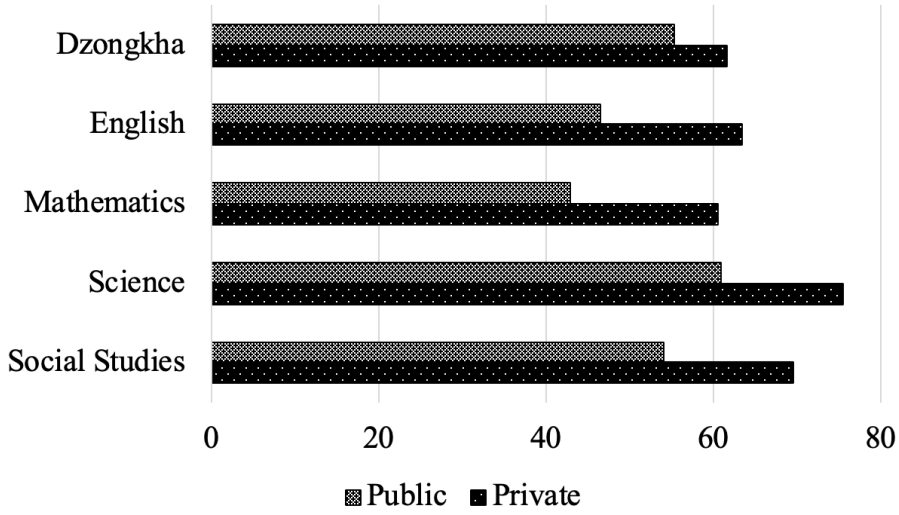


Figure 8: Performance of students in various type of schools

3.1.4 Performance of students in various level of schools

The students in PS achieved the highest mean score of 59.01 in Dzongkha followed by the students in CS (52.50) while the students in MSS had the least (48.72).

The students in HSS achieved the highest mean score in English (50.37) followed by the students in PS (48.56). The least mean score (43.83) was obtained by the students in MSS.

Similarly, the students in HSS achieved the highest mean score in Mathematics with 46.98 closely followed by the students in PS with 45.12 while the students in CS scored the least (40.51).

The students in PS achieved the highest mean score of 63.37 in Science followed by the students in HSS (61.29) and the least mean score (57.97) was obtained by the students in CS.

Similarly, students in PS achieved the highest mean score of 57.37 in Social Studies closely followed by the students in HSS (56.52). The least mean score (49.89) was obtained by the students in CS.

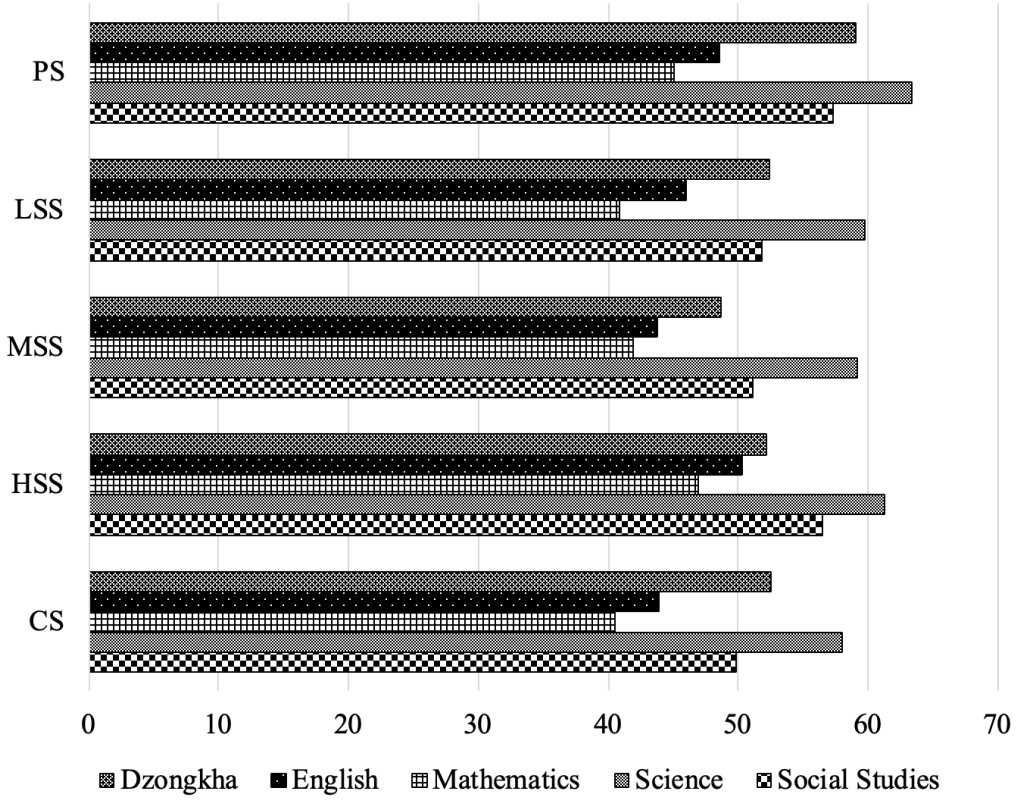


Figure 9: Performance of students in various level of schools

3.1.5 Gender performance across subjects

The female students performed slightly better than the male students in all the subjects except Mathematics. The mean scores were: 58.08 (female) and 52.58 (male) in Dzongkha, 48.09 (female) and 45.49 (male) in English, 61.49 (female) and 61.20

(male) in Science and 54.71 (female) and 54.20 (male) in Social Studies.

Figure 10: Gender performance across subjects

3.2 Gender performance in various Dzongkhags and Thromdes

3.2.1 Performance in Dzongkha

The male students of Mongar obtained the highest mean score (61.03) in Dzongkha closely followed by the male students of Lhuntse (60.86). The least mean score (36.88) was secured by the male students of Gelephu Thromde.

The female students of Samdrup Jongkhar Thromde obtained the highest mean score of 71.50 followed by the female students of Punakha (66.29). The least mean score of 46.79 was secured by the female students of Gasa.

3.2.2 Performance in English

The male students of Thimphu Thromde obtained the highest mean score of 54.23 in English followed by the male students of Bumthang with 51.53 mean score while the least mean score (41.06) was secured by the male students of Gelephu Thromde.

Similarly, the female students of Thimphu Thromde obtained the highest mean score (61.26) in English followed by the female students of Samdrup Jongkhar Thromde (56.00). The least mean score (41.89) was secured by the female students of Lhuntse.

3.2.3 Performance in Mathematics

The male students of Gelephu Thromde obtained the highest mean score of 65.88 in Mathematics followed by the male students of Thimphu Thromde with 51.77. The least mean score of 37.51 was obtained by the male students of Chukha.

The female students of Samdrup Jongkhar Thromde obtained the highest mean score (53.00) followed by the female students of Thimphu Thromde (50.50). The least mean score (33.14) was secured by the female students of Thimphu Dzongkhag.

3.2.4 Performance in Science

The male students of Lhuentse obtained the highest mean score of 70.07 in Science followed by the male students of Pema Gatshel (65.61). The least mean score of 53.85 was obtained by the male students of Thimphu Dzongkhag.

The female students of Samdrup Jongkhar Thromde obtained the highest mean score (81.00) followed by the female students of Gelephu Thromde (72.08). The least mean score (52.22) was secured by the female students of Bumthang.

3.2.5 Performance in Social Studies

The male students of Lhuntse obtained the highest mean score of 65.61 in Social Studies followed by the male students of Gelephu Thromde (61.00) while the least mean score of 44.22 was obtained by the male students of Phuentsholing Thromde.

The female students of Gelephu Thromde obtained the highest mean score (73.50) followed by the female students of Thimphu Thromde (64.81). The least mean score (47.50) was secured by the female students of Zhemgang.

3.3 Performance in Dzongkha and English across three (3) strands

3.3.1 Performance in Dzongkha

Of the three strands, students outperformed in Grammar with 67.08 mean score while the least was in Reading with 40.57.

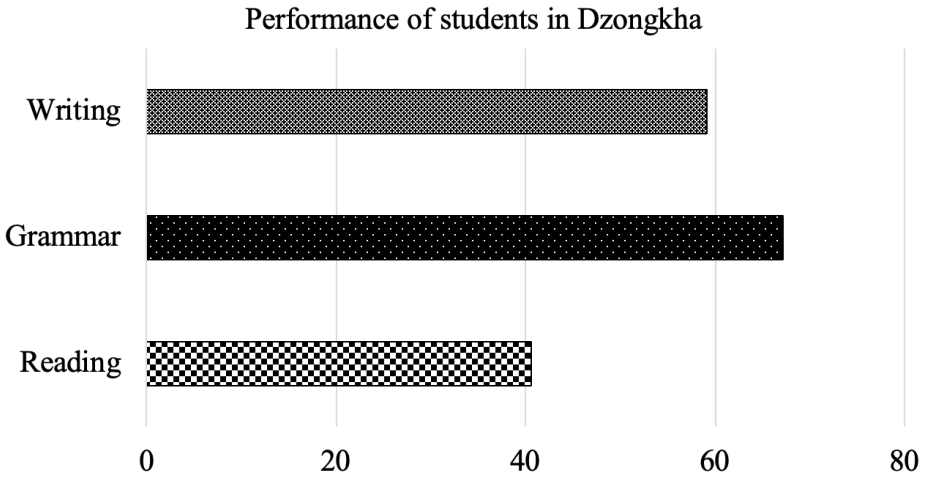


Figure 11: Performance of students in Dzongkha across three strands

3.3.2 Performance in English

Similarly, in English, students outperformed in Grammar with 47.10 mean score while the least was in Reading with 37.01.

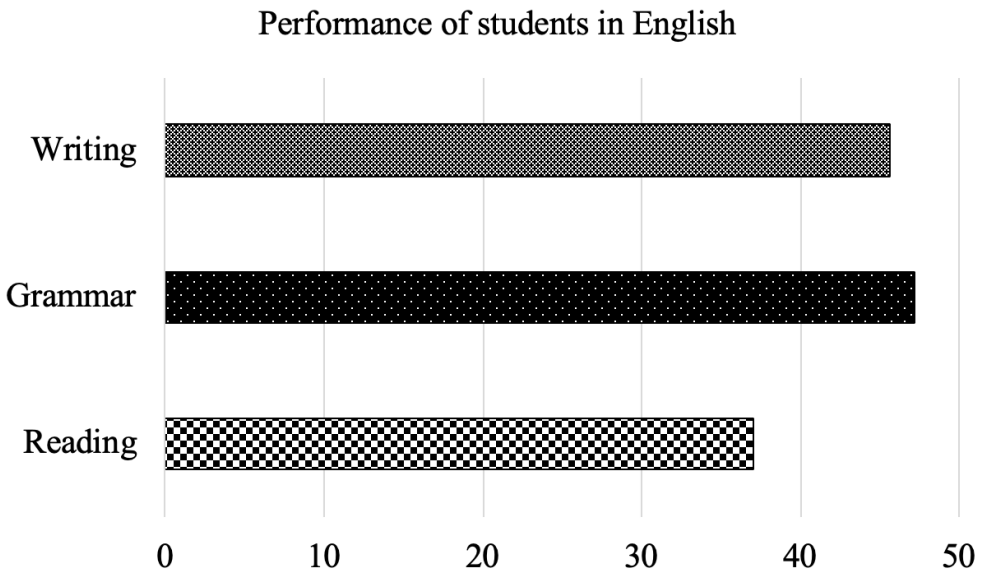


Figure 12: Performance of students in English across three strands

3.4 Gender performance in Dzongkha and English across three (3) strands

3.4.1 Performance in Dzongkha

Female students outperformed in all three strands with mean scores of 68.92 (female) and 65.01 (male) in Grammar, 61.00 (female) and 56.90 (male) in Writing and 43.36 (female) and 37.45 (male) in Reading.

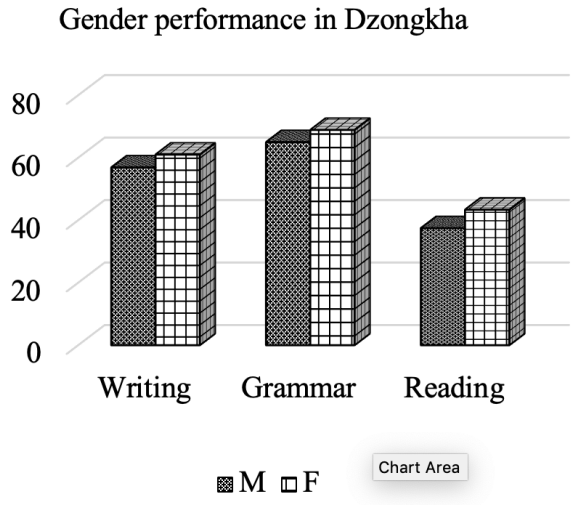


Figure 13: Gender performance in Dzongkha across three strands

3.4.2 Performance in English

Similarly, female students outperformed in all three strands with mean scores of 47.95 (female) and 46.10 (male) in Grammar, 47.46 (female) and 43.59 (male) in Writing and 37.59 (female) and 36.36 (male) in Reading.

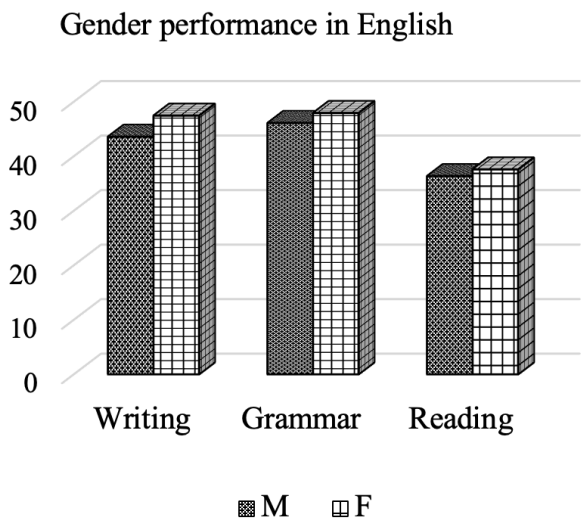


Figure 14: Gender performance in English across three strands

3.5 Performance in Mathematics across four (4) strands

Students outperformed in Measurement and geometry with 52.59 mean score while the least was in Patterns and operations (26.54).

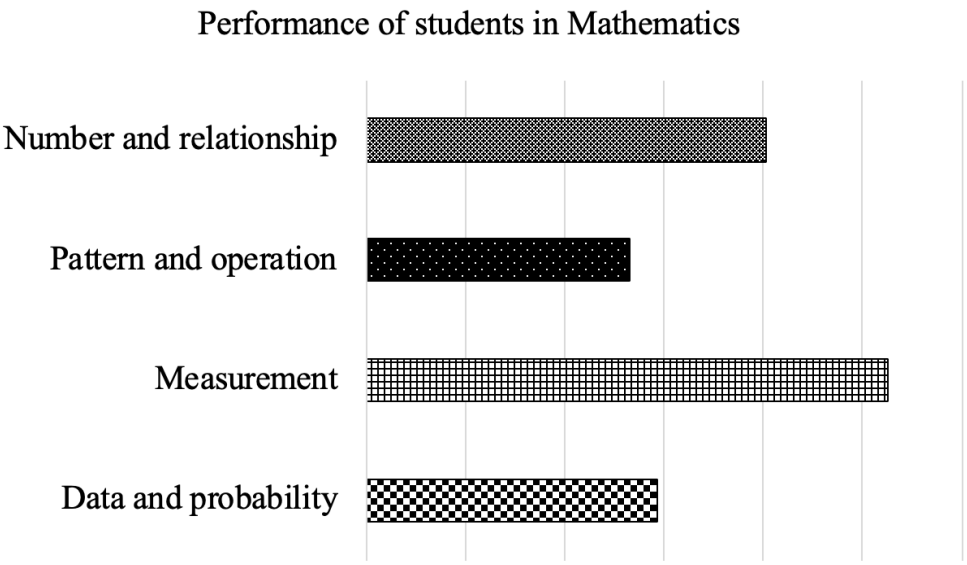


Figure 15: Performance of students in Mathematics across four strands

3.6 Gender performance in Mathematics across four (4) strands

Male students performed better than female students in all four strands with mean scores of 52.92 (male) and 52.28 (female) in Measurement and geometry, 40.41 (male) and 40.18 (female) in Number and relationship, 29.50 (male) and 29.15 (female) in Data and probability and 26.77 (male) and 26.33 (female) in Patterns and operations.

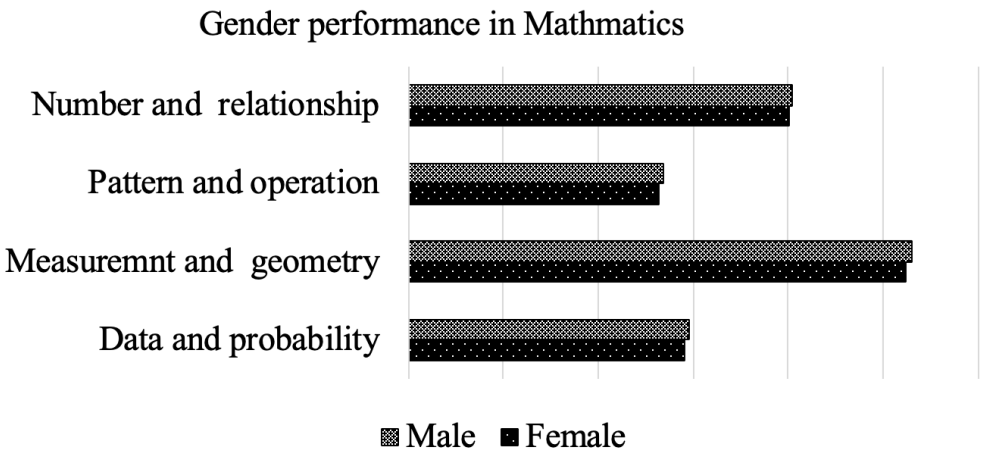


Figure 16: Gender performance in Mathematics across four strands

3.7 Performance in Science across twelve (12) chapters

The overall performance of students was highest in Elements, acids and alkalis with 76.87 mean score followed by Separating mixture (68.88) while the least was in Green plants (47.4).

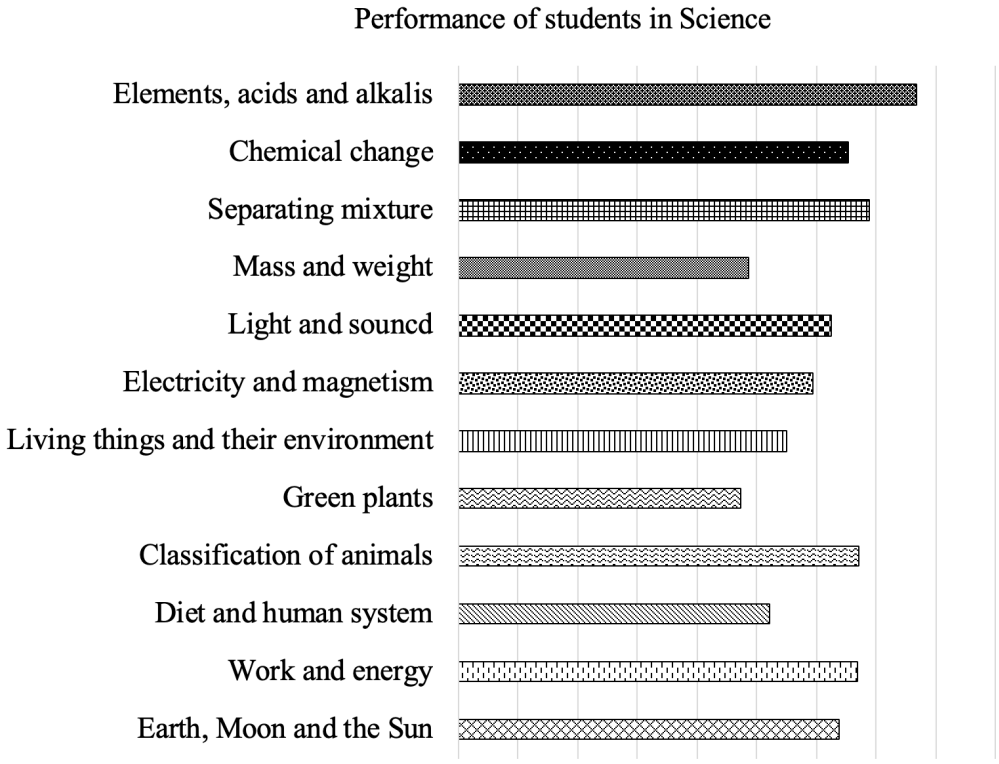


Figure 17: Performance of students in Science across twelve chapters

3.8 Gender performance in Science across twelve (12) chapters

Both male and female students outperformed in Elements, acids and alkalis (female: 77.94 and male: 75.75) followed by Separating mixture (female: 69.80 and male: 67.88). Similarly, both found Green plants difficult securing the least mean

score (female: 48.01 and male: 46.64).

In almost all chapters, female students performed slightly better than the male students.

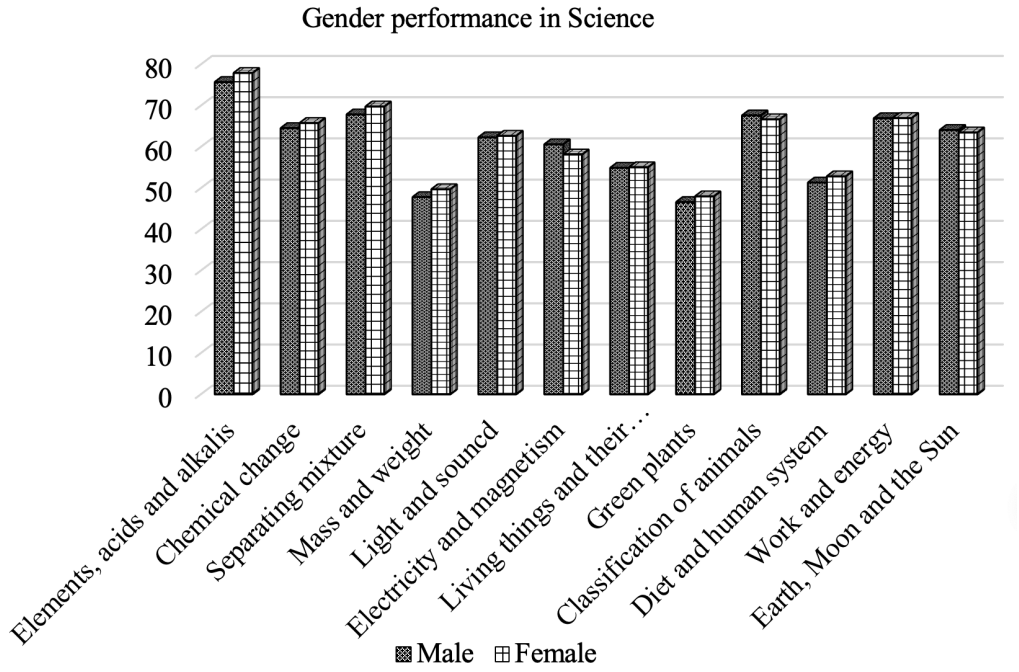


Figure 18: Gender performance in Science across twelve chapters

3.9 Performance in Social Studies across three (3) units

Students outperformed in People and places with 67.00 mean score while the least was in Environment (45.52).

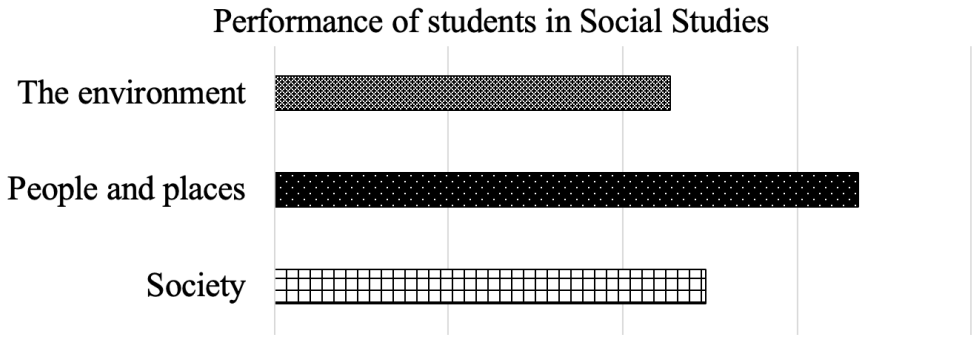


Figure 19: Performance of students in Social Studies across three units

3.10 Gender performance in Social Studies across three (3) units

Both male and female students found People and places easy (male: 67.20 and female: 66.82) while both found Environment difficult (male: 46.32 and female: 44.84).

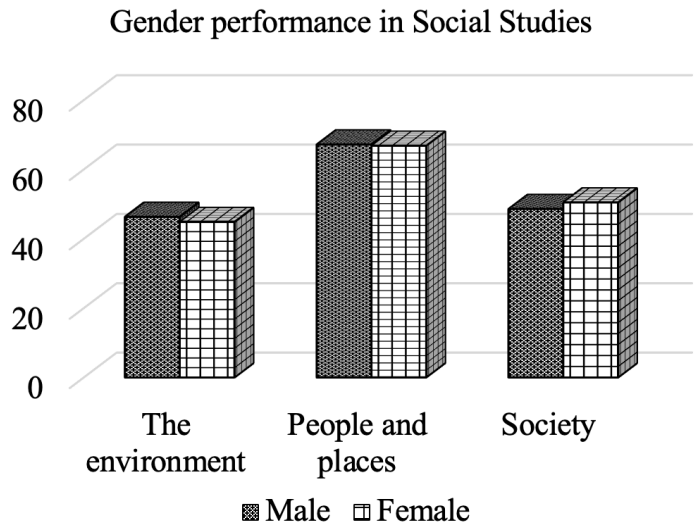


Figure 20: Gender performance in Social Studies across three units

3.11 Discrepancy in scores between Central and School level evaluation

The sample answer scripts of CBAT-VI 2018 across all subjects were centrally re-evaluated by the teachers from the field. A comparative study was done between the scores obtained by the sample students at the school level and central level to ascertain if there was discrepancy in the school level evaluation in 2018.

Accordingly, the findings showed that there was a huge discrepancy in mean scores across the subjects especially in English and Dzongkha.

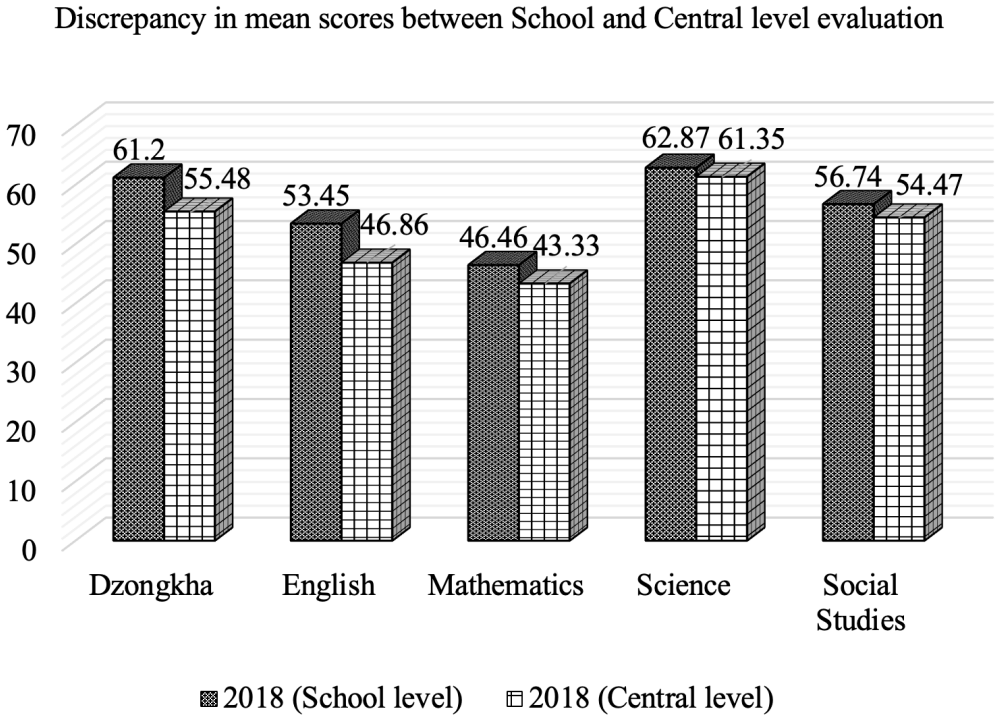


Figure 21: Discrepancy in scores between School and Central level evaluation

In Dzongkha, only 1.64% (N:18) of the students' scores in school level evaluation was equivalent to the central level evaluation while 86.33% (N: 947) of the students' scores were more than the actual score to be awarded as per BCSEA's marking scheme.

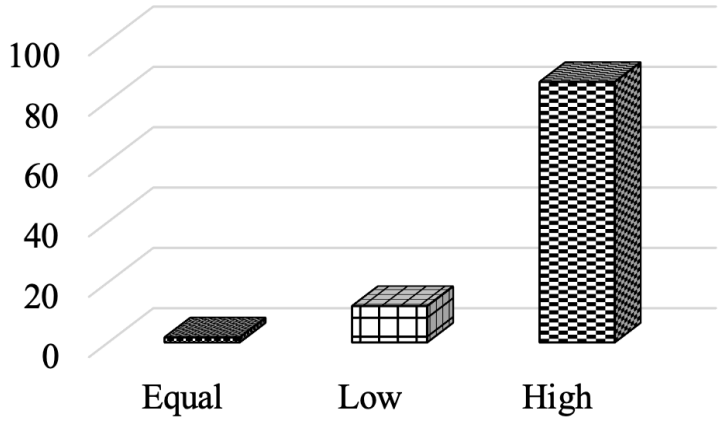


Figure 22: Discrepancy of scores in Dzongkha

Similarly in English, 90.69% (N: 994) of the students' scores were more than the actual score to be awarded as per BCSEA's marking scheme while only 2.10% (N:23) of the students' scores in school level evaluation was equivalent to the central level evaluation.

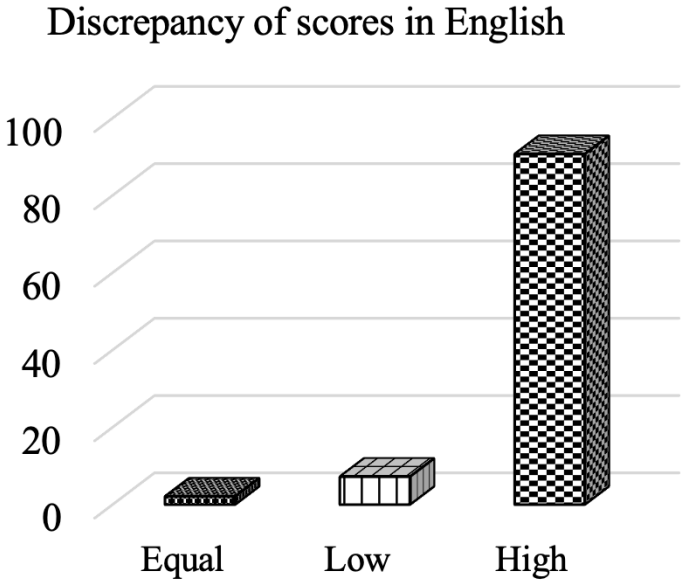


Figure 23: Discrepancy of scores in English

In Mathematics, 5.12% (N: 56) of the students' scores in school level evaluation was equivalent to the central level evaluation while 76.14% (N: 833) of the students' scores were more than the actual score to be awarded as per BCSEA's marking scheme.

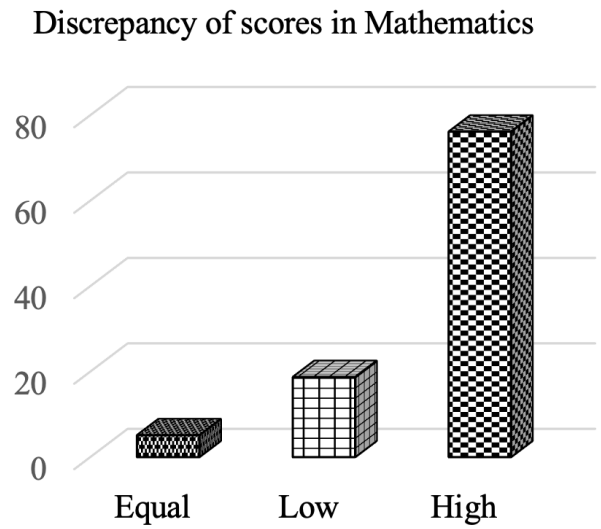


Figure 24: Discrepancy of scores in Mathematics

In Science, 8.11% (N: 89) of the students' scores in school level evaluation was equivalent to the central level evaluation while 67.09% (N: 736) of the students' scores were more than the actual score to be awarded as per BCSEA's marking scheme.

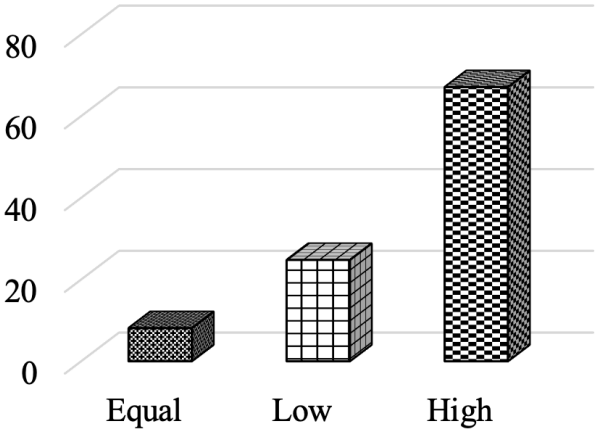


Figure 25: Discrepancy of scores in Science

In Social Studies, 6.65% (N: 73) of the students' scores in school level evaluation was equivalent to the central level evaluation while 72.93% (N: 800) of the students' scores were more than the actual score to be awarded as per BCSEA's marking scheme.

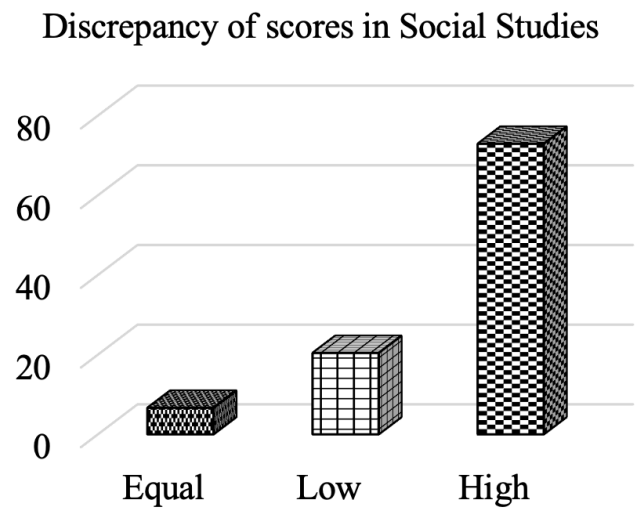


Figure 26: Discrepancy of scores in Social Studies

3.12 Performance trend of Class VI students (2016-2018)

3.12.1 Performance of students considering Central level evaluation

Over the years, the performance of students across all subjects showed inconsistency. However, there was a significant improvement as per the central level evaluation of Science in 2018 (61.35) compared to its baseline mean score in 2016 (54.01) followed by Social Studies (2016: 51.19 and 2018: 54.47).

Despite the slight improvement in Mathematics performance in 2018 (43.33) compared to its baseline mean score in 2016 (41.27), the performance over the years in Mathematics had been the lowest amongst all subjects.

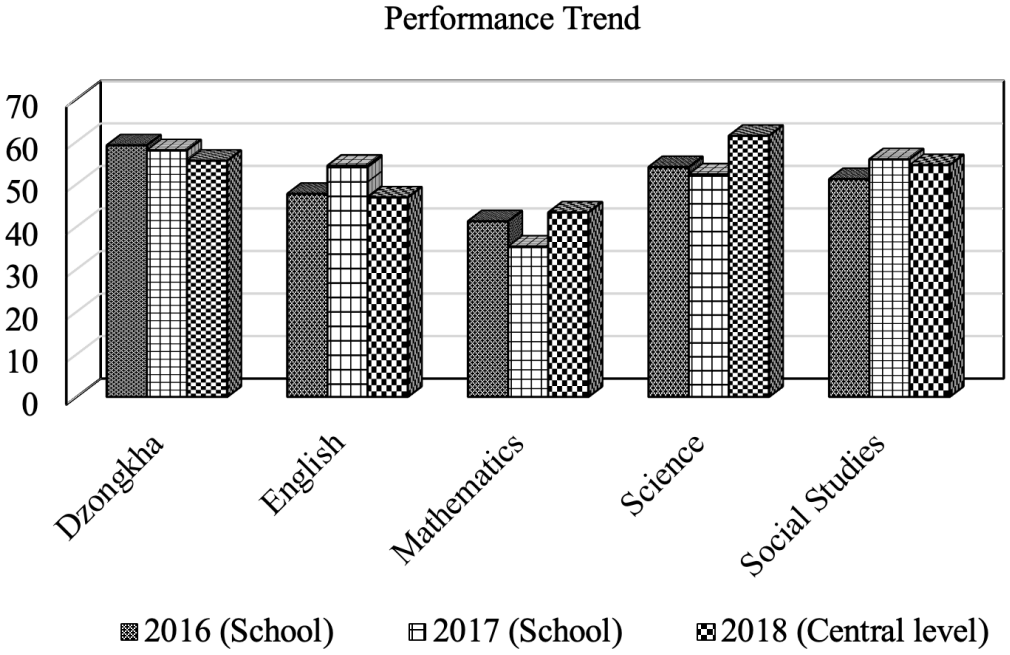


Figure 27: Performance trend of students across five subjects considering the central level evaluation 2018

3.12.2 Performance of students considering School level evaluation

Over the years, the performance of students was inconsistent across all subjects when considering the scores achieved at school level evaluation except Social Studies.

The performance in Social Studies was progressive in the last three years (2016:51.19, 2017:55.83 and 2018:56.74). In 2018, the performance of students as per the school level evaluation showed improvement when compared to their baseline mean scores in 2016.

Similar to the findings of central level evaluation, the performance in Mathematics as per school level evaluation showed slight improvement in 2018 (43.33) compared to its baseline mean score in 2016 (41.27). The overall performance in Mathematics had been the lowest amongst all subjects over the years.

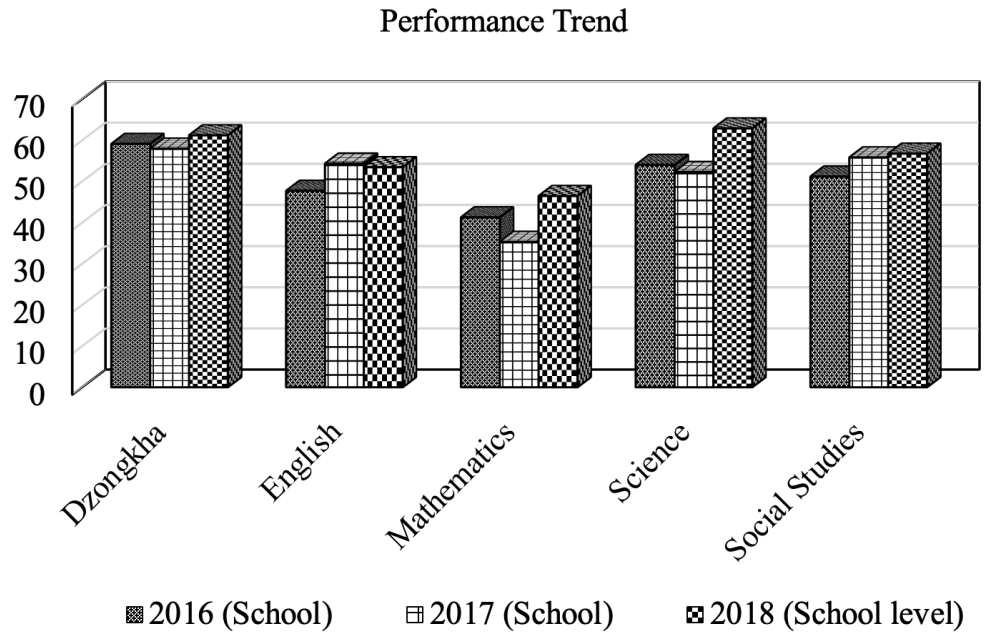


Figure 28: Performance trend of students across five subjects considering school level evaluation 2018

3.13 Performance trend across Dzongkhags and Thromdes

The performance in Dzongkha across Dzongkhags and Thromdes over the years had been inconsistent, however, in 2018, the performance of students in Punakha and Trashiyangtse showed slight improvement (61.04 and 62.14) compared to their baseline mean scores in 2016 (60.91 and 61.96).

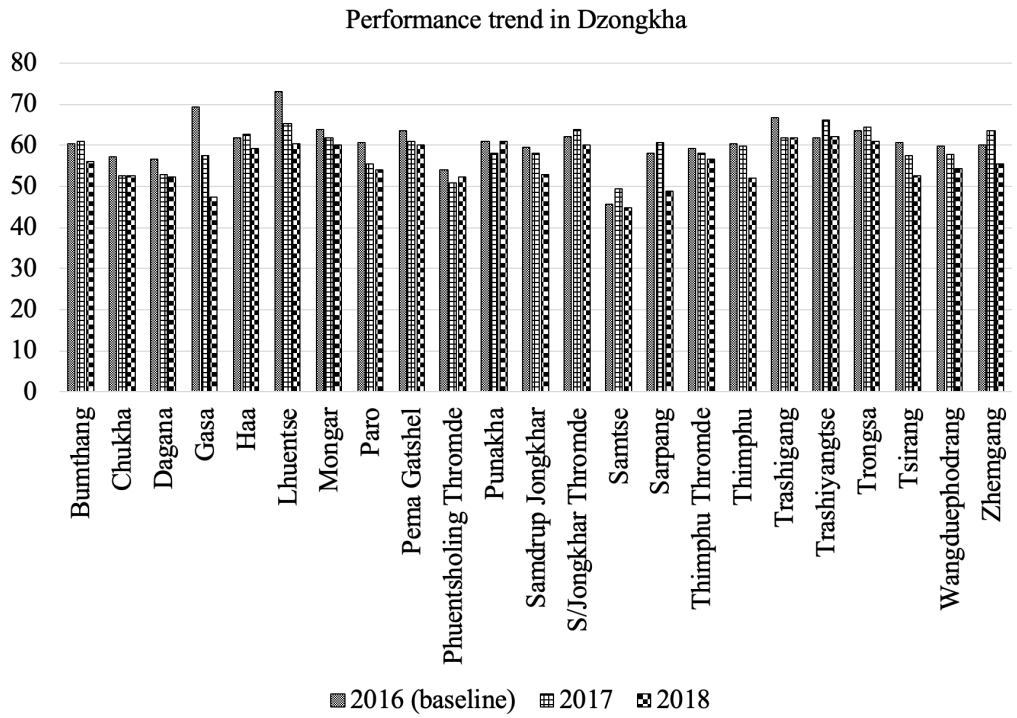


Figure 29: Performance trend in Dzongkha across Dzongkhags and Thromdes

In English, the performance of students in Haa, Samdrup Jongkhar Thromde and Thimphu Thromde improved significantly in 2018 when compared to their baseline mean scores in 2016.

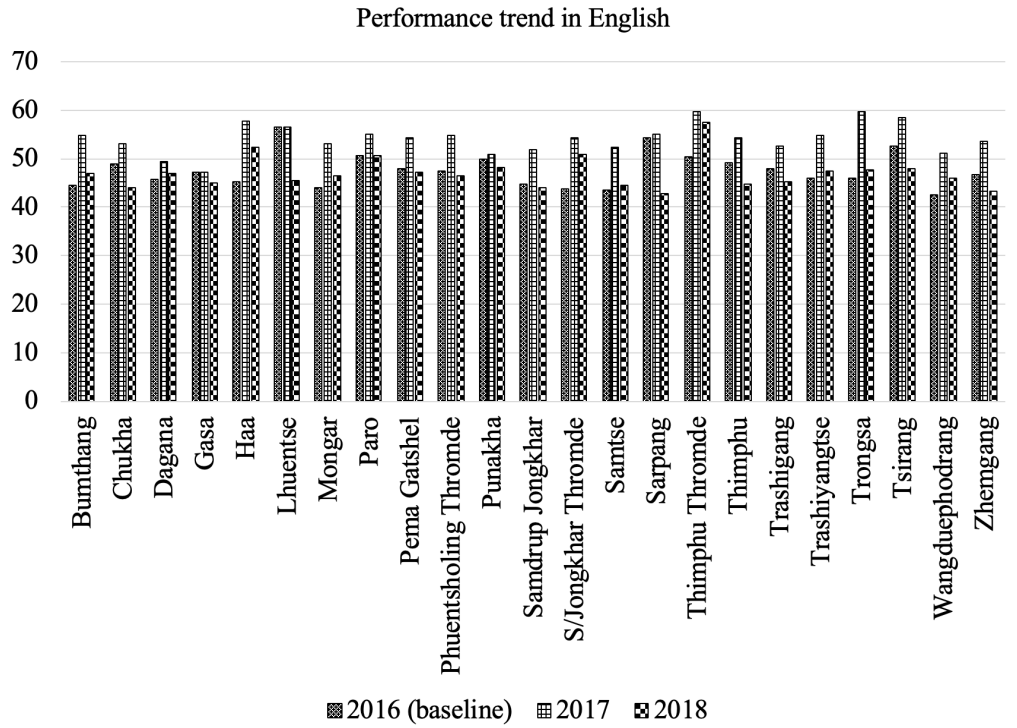


Figure 30: Performance trend in English across Dzongkhags and Thromdes

In Mathematics, the students of Gasa, Haa and Wangduephodrang improved significantly in 2018 when compared to their baseline mean scores in 2016.

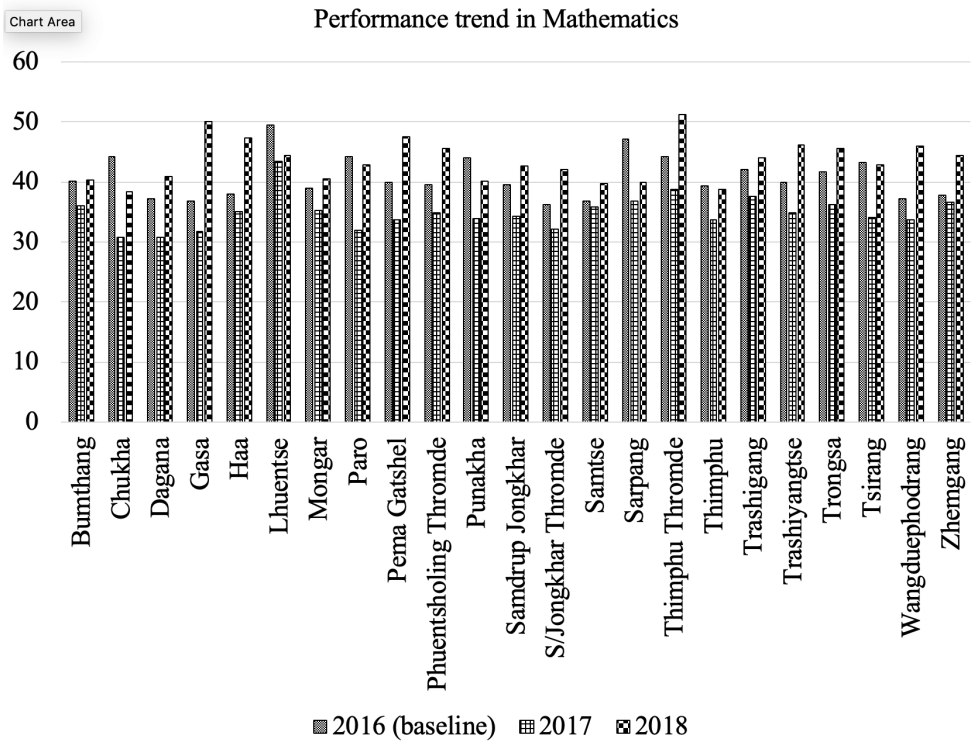


Figure 31: Performance trend in Mathematics across Dzongkhags and Thromdes

In Science, the performance of students in Haa, Phuentsholing Thromde, Samdrup Jongkhar Thromde, Samtse, Wangduephodrang and Zhemgang showed progressive improvement over the years compared to their baseline mean scores in 2016. The students of Dagana, Gasa, Haa, Mongar, Pema Gatshel, Samdrup Jongkhar Thromde, Samtse, Thimphu Thromde, Trashiyangtse, Wangdiphodrang and Zhemgang improved significantly in 2018.

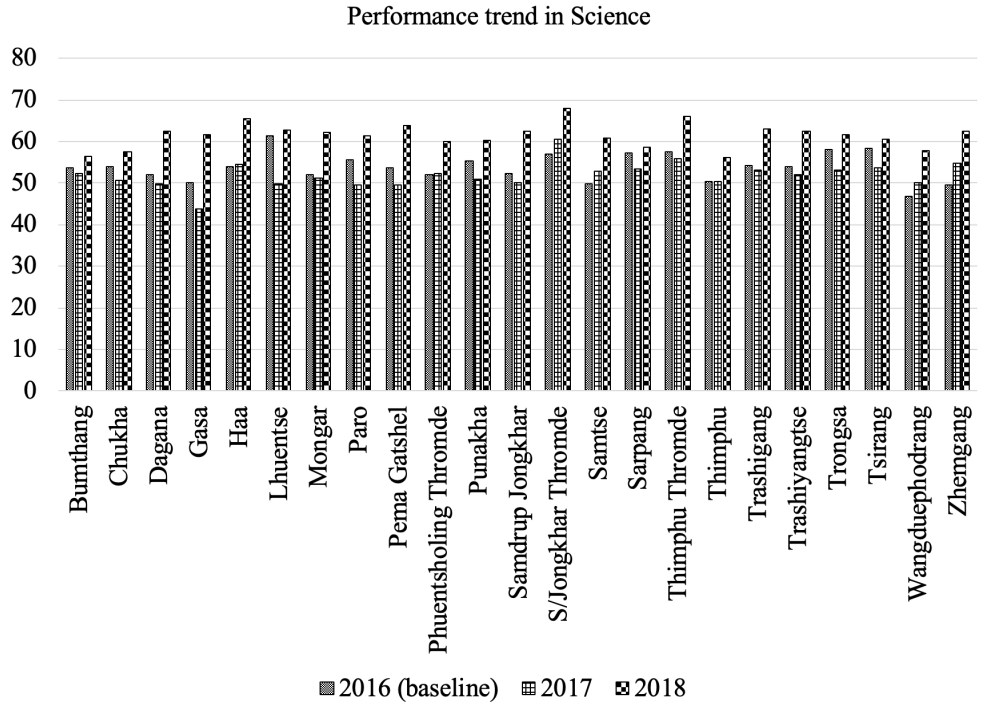


Figure 32: Performance trend in Science across Dzongkhags and Thromdes

The students in Dagana, Haa, Mongar, Pema Gatshel, Samtse, Thimphu Thromde and Trashiyangtse showed progressive improvement in Social Studies over the years. Compared to the baseline mean scores in 2016, the students of Dagana, Gasa, Haa, Mongar, Paro, Pema Gatshel, Thimphu Thromde, Trashigang and Trongsa improved significantly in 2018.

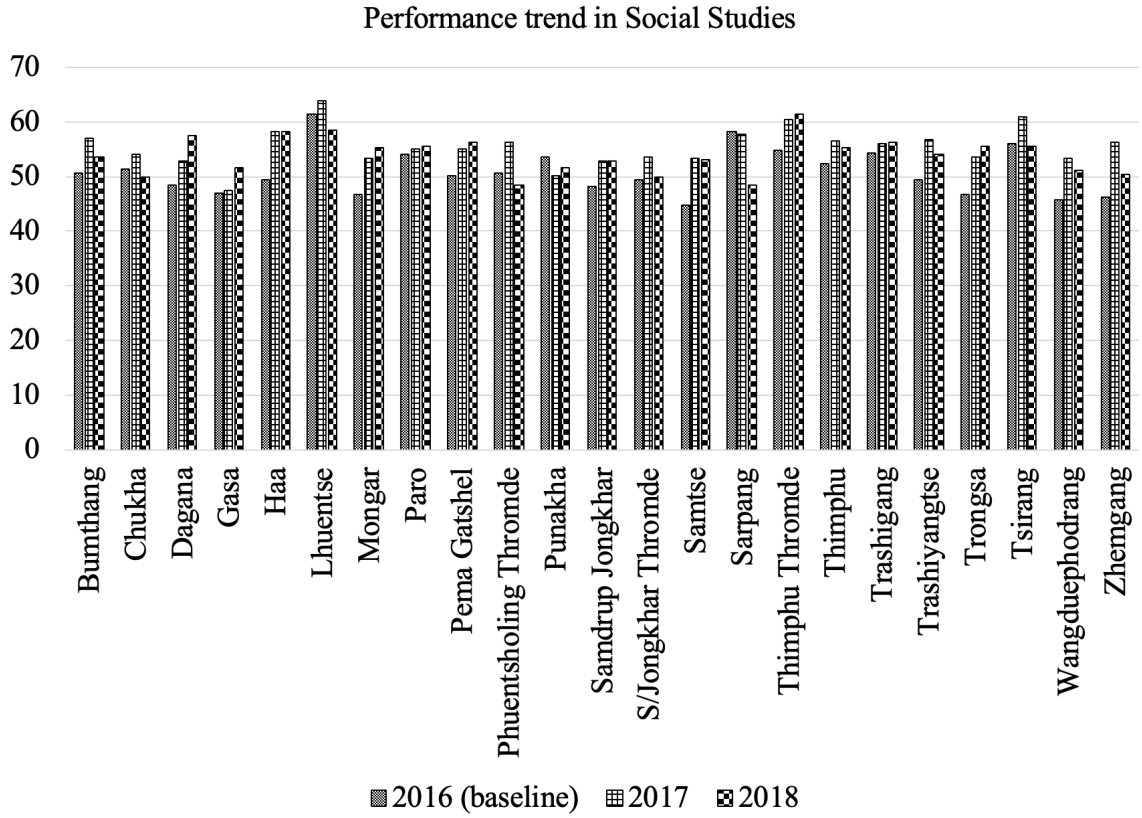


Figure 33: Performance trend in Social Studies across Dzongkhags and Thromdes

CHAPTER 4: RECOMMENDATIONS

Based on the major findings from the study of CBAT-VI 2018, the following recommendations were made:

1. Schools should emphasize on effective teaching-learning processes especially in teaching Mathematics, Dzongkha and English subjects.
2. Schools should collaborate and promote exchange of professional expertise to enhance good teaching-learning practices.
3. Enhance professional development programme for teachers in their subject knowledge and pedagogical competencies.
4. Schools should institute strong reading culture in both Dzongkha and English; strengthen teacher model reading; offer literary activities and provide varieties of reading materials to enhance students' reading and comprehension skills.
5. Schools should bridge gender learning gap through the use of appropriate strategies in teaching-learning process.
6. Schools should strictly follow the marking scheme and model answers provided by BCSEA and should standardize the answers for open-response questions for consistency and reliability across the schools in the country.

CHAPTER 5: CONCLUSION

This study was based on the CBAT-VI 2018 raw marks obtained by the sample students in central level evaluation from 219 schools covering a student population of 1097, out of which, 519 were males and 578 were females. The study was conducted to determine the overall academic achievement and performance trend of students in Dzongkha, English, Mathematics, Science and Social Studies across various Dzongkhags and Thromdes, school locations, school types, school levels and gender. Further, to find if there was any discrepancy in scores between the school level and central level evaluation.

The major findings of the students' performance over the years (2016-2018) indicated the prevalence of learning gaps between schools in various Dzongkhags and Thromdes, school locations, school types, and school levels. Similarly, there were differences in the performance of both male and female students across five subjects. The study ascertained the existence of discrepancies in scores between school level and central level evaluation especially in English and Dzongkha subjects.

The study was successfully completed due to the support and cooperation rendered by the DEOs, TEOs, principals and teachers.

BCSEA wishes the relevant stakeholders to consider the findings of this study in the process of making policy decisions and in improving the student learning outcomes.

Annexure

Annexure 1: Demographic information of CBAT-VI 2018 (census)

Sl. No.	Dzongkhag	No. of school	National			Non national			Grand Total
			Boys	Girls	Total	Boys	Girls	Total	
1	Bumthang	11	140	159	299				299
2	Chukha	33	460	480	940				940
3	Phuntsholing Thromde	5	163	172	335			0	335
4	Dagana	21	276	300	576				576
5	Gasa	4	47	37	84				84
6	Haa	7	119	130	249				249
7	Lhuentse	12	122	124	246				246
8	Mongar	28	367	403	770	0	0	0	770
9	Paro	17	327	362	689	2	2	4	693
10	Pema Gatshel	21	209	201	410				410
11	Punakha	14	211	265	476		1	1	477
12	S/Jongkhar	15	241	245	486				486
13	S/J Thromde	2	97	99	196				196
14	Samtse	31	723	641	1364				1364
15	Sarpang	19	407	431	838				838
16	Gelephu Thromde	2	72	92	164				164
17	Thimphu	9	123	150	273				273
18	Thimphu Thromde	23	810	828	1638	6	6	12	1650
19	Trashigang	41	338	465	803				803
20	Trashi Yangtse	23	167	192	359				359
21	Trongsa	10	97	102	199				199
22	Tsirang	14	258	228	486				486
23	Wangdue	25	329	374	703				703
24	Zhemgang	18	174	193	367			0	367
	Total	405	6277	6673	12950	8	9	17	12967

Annexure 2: Demographic information of CBAT-VI 2018 sampled students

Sl. No.	Dzongkhag	Registered		Sampled Schools	Boys	Girls	Total
		Total schools	Total students				
1	Bumthang	11	299	7	17	18	35
2	Chukha	33	940	15	36	39	75
3	Dagana	21	576	12	28	34	62
4	Gasa	4	84	3	8	7	15
5	Gelephu Thromde	2	164	2	4	6	10
6	Haa	7	249	6	13	17	30
7	Lhuentse	12	246	7	14	21	35
8	Mongar	28	770	14	35	36	71
9	Paro	17	693	10	26	27	53
10	Pema Gatshel	21	410	11	29	26	55

Sl. No.	Dzongkhag	Registered		Sampled Schools	Boys	Girls	Total
		Total schools	Total students				
11	Phuentsholing Thromde	5	335	4	9	11	20
12	Punakha	14	477	8	19	22	41
13	Samdrup Jongkhar	15	486	9	21	24	45
14	S/Jongkhar Thromde	2	196	1	3	2	5
15	Samtse	31	1364	16	45	38	83
16	Sarpang	19	838	10	26	24	50
17	Thimphu	9	273	6	14	17	31
18	Thimphu Thromde	23	1650	12	32	29	61
19	Trashigang	41	803	19	41	56	97
20	Trashiyangtse	23	359	12	23	37	60
21	Trongsa	10	199	6	14	17	31
22	Tsirang	14	486	8	21	19	40
23	Wangdue	25	703	13	29	37	66
24	Zhemgang	18	367	8	19	22	41
	Total	405	12967	219	526	586	1112

Annexure 3: Number of Students in each Dzongkhag

Dzongkhag	Frequency	Percent
Bumthang	35.00	3.19
Chukha	74.00	6.75
Dagana	68.00	6.20
Gasa	15.00	1.37
Gelephu Thromde	10.00	0.91
Ha	28.00	2.55
Lhuentse	35.00	3.19
Mongar	69.00	6.29
Paro	52.00	4.74
Pema Gatshel	54.00	4.92
Phuentsholing Thromde	20.00	1.82
Punakha	40.00	3.65
Samdrup Jongkhar	45.00	4.10
S/Jongkhar Thromde	4.00	0.36
Samtse	79.00	7.20
Sarpang	48.00	4.38
Thimphu Thromde	61.00	5.56
Thimphu	31.00	2.83
Trashigang	96.00	8.75
Trashiyangtse	59.00	5.38
Trongsa	30.00	2.73
Tsirang	40.00	3.65
Wangdue	65.00	5.93
Zhemgang	39.00	3.56

Dzongkhag	Frequency	Percent
Total	1097.00	100.00

Annexure 4: Number of students in various level of schools

Level	Frequency	Percent
PS	577	52.60
LSS	195	17.78
MSS	124	11.30
HSS	26	2.37
CS	175	15.95
Total	1097	100.0

Annexure 5: Number of students in various type of schools

Type	Frequency	Percent
Public	1066	97.17
Private	31	2.83
Total	1097	100.00

Annexure 6: Number of students in various school locations

	Frequency	Percent
Urban	228	20.8
Semi Urben	62	5.7
Semi Urban	200	18.2
Remote	306	27.9
Very Remote	160	14.6
Difficult	141	12.9
Total	1097	100.0

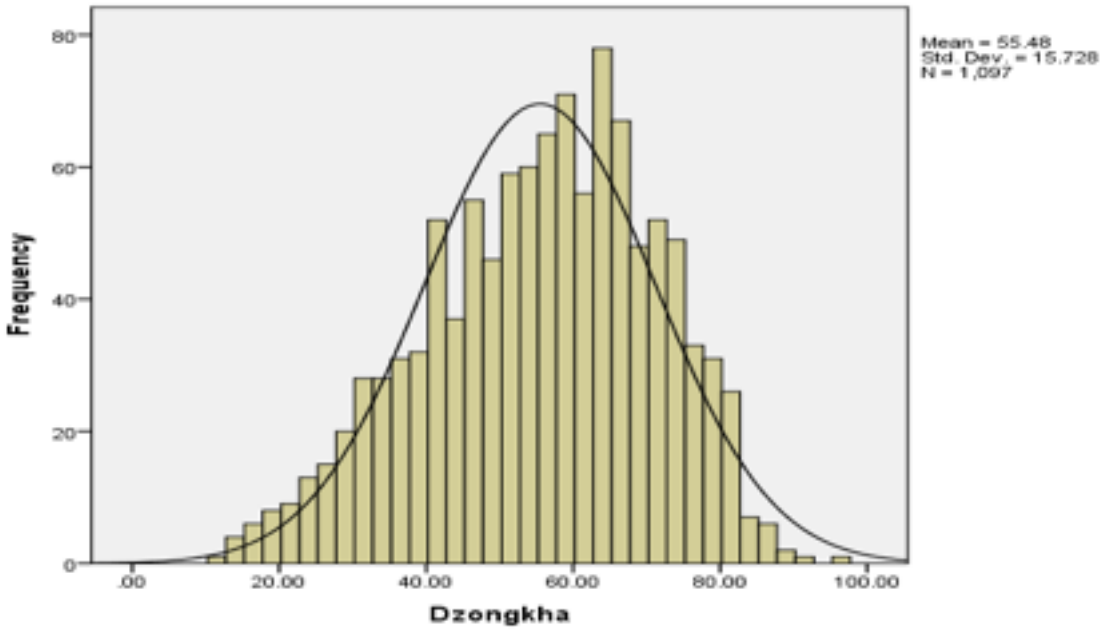
Annexure 7: Number of male and female students

Gender	Frequency	Percent
Male	519	47.31
Female	578	52.69
Total	1097	100.00

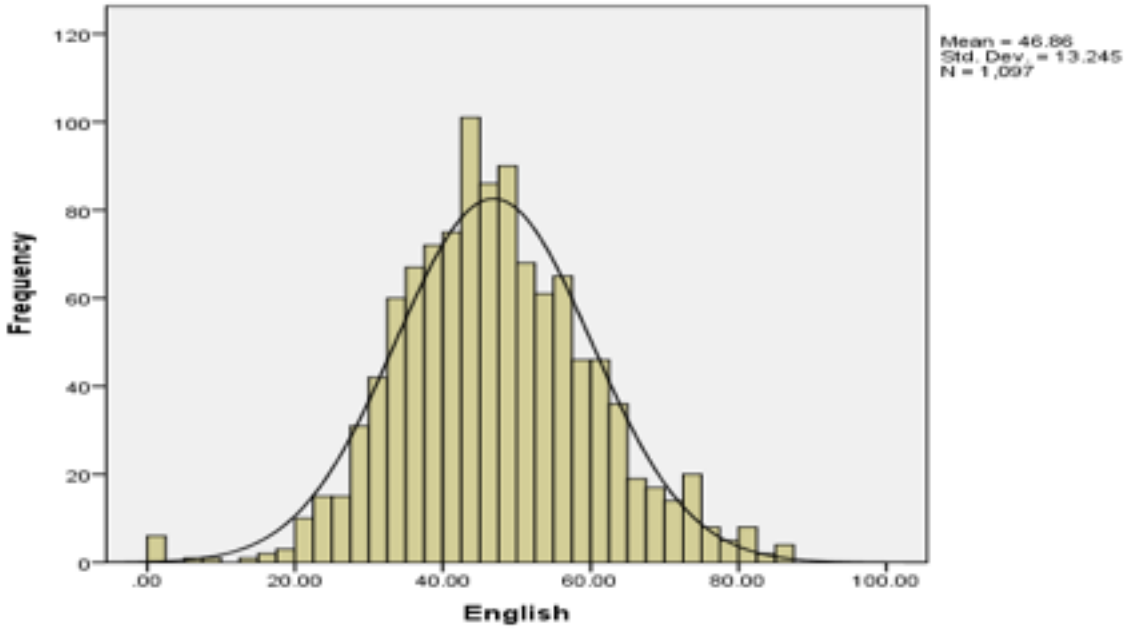
Annexure 8: Overall performance of students across Five subjects

	N	Mean	SEM	SD
Dzongkha	1097	55.48	0.47	15.73
English	1097	46.86	0.40	13.24
Mathematics	1097	43.33	0.46	15.12
Science	1097	61.35	0.49	16.07
Social Studies	1097	54.47	0.52	17.16
Valid N (list wise)	1097			

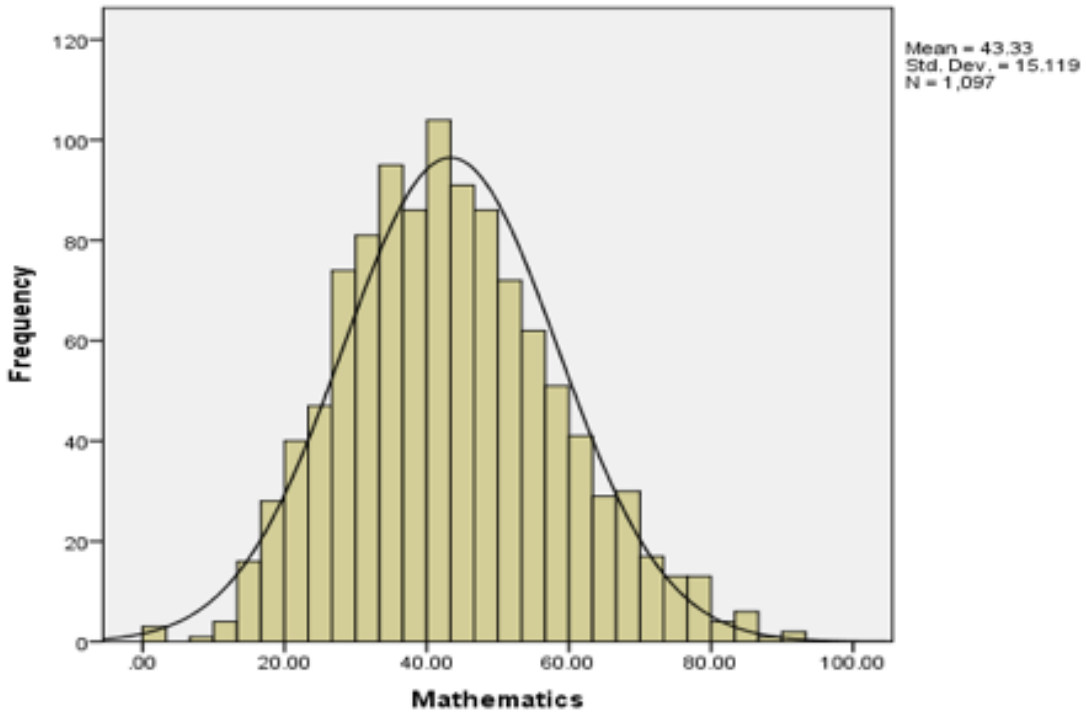
Annexure 9: Distribution of marks in Dzongkha



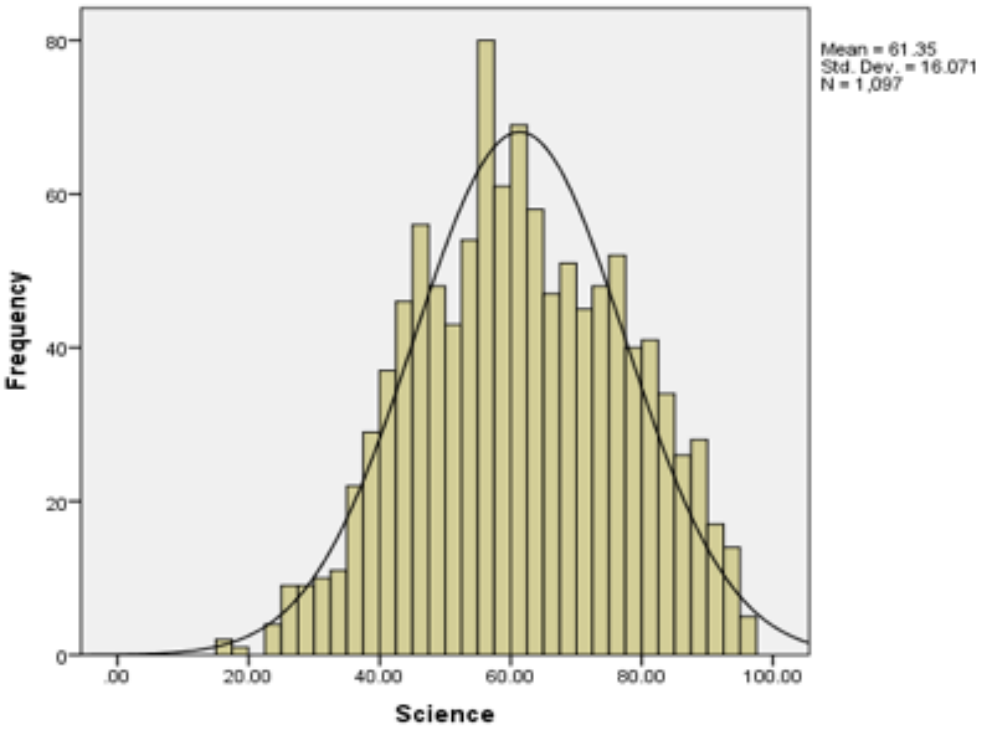
Annexure 10: Distribution of marks in English



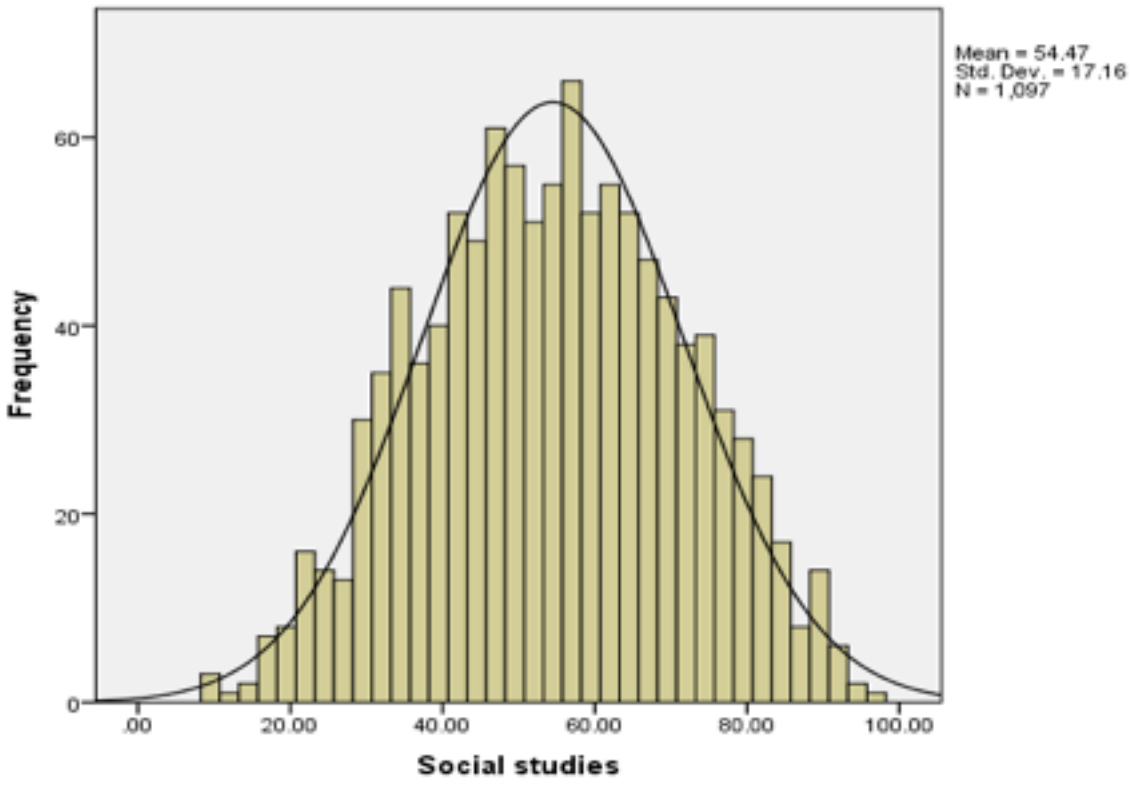
Annexure 11: Distribution of marks in Mathematics



Annexure 12: Distribution of marks in Science



Annexure 13: Distribution of marks in Social studies



Annexure 14: Overall performance of students across Dzongkhags and Thromdes

Dzongkhag		Dzongkha	English	Mathematics	Science	Social Studies
Bumthang	N	35.00	35.00	35.00	35.00	35.00
	Mean	56.06	46.95	40.27	56.39	53.70
	SD	13.36	11.96	11.52	16.76	17.76
	SEM	2.26	2.02	1.95	2.83	3.00
Chukha	N	74.00	74.00	74.00	74.00	74.00
	Mean	52.70	43.99	38.40	57.59	50.03
	SD	17.33	14.29	13.99	16.65	16.96
	SEM	2.01	1.66	1.63	1.93	1.97
Dagana	N	68.00	68.00	68.00	68.00	68.00
	Mean	52.35	46.97	40.95	62.50	57.47
	SD	17.75	13.09	14.93	15.38	18.54
	SEM	2.15	1.59	1.81	1.86	2.25
Gasa	N	15.00	15.00	15.00	15.00	15.00
	Mean	47.40	45.05	50.13	61.70	51.70
	S D	16.11	16.30	16.95	16.65	16.41
	SEM	4.16	4.21	4.38	4.30	4.24
Gelephu Thromde	N	10.00	10.00	10.00	10.00	10.00
	M	43.00	47.40	53.05	66.20	68.50

Dzongkhag		Dzongkha	English	Mathematics	Science	Social Studies
	SD	20.28	17.16	19.81	19.70	18.64
	SEM	6.41	5.43	6.26	6.23	5.89
Haa	N	28.00	28.00	28.00	28.00	28.00
	Mean	59.20	52.33	47.29	65.39	58.29
	SD	14.40	12.79	15.24	14.19	15.70
	SEM	2.72	2.42	2.88	2.68	2.97
Lhuentse	N	35.00	35.00	35.00	35.00	35.00
	Mean	60.51	45.55	44.39	62.77	58.60
	SD	15.09	17.75	11.98	18.11	19.63
	SEM	2.55	3.00	2.02	3.06	3.32
Mongar	N	69.00	69.00	69.00	69.00	69.00
	Mean	60.25	46.57	40.56	62.12	55.38
	SD	12.61	12.14	14.82	15.70	16.12
	SEM	1.52	1.46	1.78	1.89	1.94
Paro	N	52.00	52.00	52.00	52.00	52.00
	Mean	54.14	50.73	42.81	61.46	55.51
	SD	14.22	15.10	16.22	16.27	17.74
	SEM	1.97	2.09	2.25	2.26	2.46
Pema Gatshel	N	54.00	54.00	54.00	54.00	54.00
	Mean	60.14	47.22	47.50	63.69	56.23
	SD	15.08	12.35	15.95	15.42	16.03
	SEM	2.05	1.68	2.17	2.10	2.18
Phuentsholing Thromde	N	20.00	20.00	20.00	20.00	20.00
	Mean	52.30	46.40	45.60	59.93	48.53
	SD	16.56	13.03	18.77	24.97	21.68
	SEM	3.70	2.91	4.20	5.58	4.85
Punakha	N	40.00	40.00	40.00	40.00	40.00
	Mean	61.04	48.21	40.18	60.24	51.64
	SD	13.81	11.60	14.70	15.09	13.72
	SEM	2.18	1.83	2.32	2.39	2.17
Samdrup Jongkhar	N	45.00	45.00	45.00	45.00	45.00
	Mean	52.89	43.96	42.70	62.54	52.78
	SD	17.55	13.50	14.59	17.56	18.58
	SEM	2.62	2.01	2.17	2.62	2.77
S/Jongkhar Thromde	N	4.00	4.00	4.00	4.00	4.00
	Mean	60.13	51.00	42.00	68.00	50.00
	SD	15.84	8.90	10.27	14.92	15.77
	SEM	7.92	4.45	5.14	7.46	7.88
Samtse	N	79.00	79.00	79.00	79.00	79.00
	Mean	44.72	44.51	39.69	60.89	53.06
	SD	13.61	11.41	13.38	13.79	16.35
	SEM	1.53	1.28	1.51	1.55	1.84
Sarpang	N	48.00	48.00	48.00	48.00	48.00
	Mean	48.99	42.72	39.88	58.48	48.48

Dzongkhag		Dzongkha	English	Mathematics	Science	Social Studies
	SD	14.87	11.16	14.17	15.49	15.82
	SEM	2.15	1.61	2.04	2.24	2.28
Thimphu Thromde	N	61.00	61.00	61.00	61.00	61.00
	Mean	56.75	57.57	51.16	66.12	61.36
	SD	16.63	13.11	15.01	16.38	16.77
	SEM	2.13	1.68	1.92	2.10	2.15
Thimphu	N	31.00	31.00	31.00	31.00	31.00
	Mean	52.16	44.89	38.81	56.26	55.32
	SD	13.49	14.76	16.12	14.15	15.10
	SEM	2.42	2.65	2.90	2.54	2.71
Trashigang	N	96.00	96.00	96.00	96.00	96.00
	Mean	61.76	45.29	44.02	62.88	56.27
	SD	13.04	11.97	13.95	14.31	15.45
	SEM	1.33	1.22	1.42	1.46	1.58
Trashiyangtse	N	59.00	59.00	59.00	59.00	59.00
	Mean	62.14	47.45	46.26	62.54	54.18
	SD	11.72	10.93	17.51	15.91	18.19
	SEM	1.53	1.42	2.28	2.07	2.37
Trongsa	N	30.00	30.00	30.00	30.00	30.00
	Mean	60.87	47.81	45.60	61.67	55.57
	SD	12.28	8.44	9.23	15.05	14.09
	SEM	2.24	1.54	1.69	2.75	2.57
Tsirang	N	40.00	40.00	40.00	40.00	40.00
	Mean	52.69	48.03	42.86	60.49	55.63
	SD	18.69	15.81	13.42	18.38	18.04
	SEM	2.96	2.50	2.12	2.91	2.85
Wangduephodrang	N	65.00	65.00	65.00	65.00	65.00
	Mean	54.41	46.12	46.06	57.79	51.26
	SD	14.12	12.49	16.34	16.21	18.00
	SEM	1.75	1.55	2.03	2.01	2.23
Zhemgang	N	39.00	39.00	39.00	39.00	39.00
	Mean	55.49	43.32	44.42	62.53	50.32
	SD	16.59	12.29	16.25	15.80	17.17
	SEM	2.66	1.97	2.60	2.53	2.75

Annexure 15: Performance of students in various Location of schools

Location		Dzongkha	English	Mathematics	Science	Social Studies
Urban	Number	228.00	228.00	228.00	228.00	228.00
	Mean	53.86	50.08	44.54	61.85	55.75
	SD	16.07	13.95	16.21	17.63	17.95
	SEM	1.06	0.92	1.07	1.17	1.19
Semi Urban	Number	62.00	62.00	62.00	62.00	62.00
	Mean	51.38	46.21	46.59	59.94	51.50

Location		Dzongkha	English	Mathematics	Science	Social Studies
	SD	16.75	15.32	15.61	16.84	18.18
	SEM	2.13	1.95	1.98	2.14	2.31
Semi Remote	Number	200.00	200.00	200.00	200.00	200.00
	Mean	53.15	46.22	40.52	58.46	53.02
	SD	15.69	13.03	13.87	15.55	17.06
	SEM	1.11	0.92	0.98	1.10	1.21
Remote	Number	306.00	306.00	306.00	306.00	306.00
	Mean	56.21	45.37	42.94	60.28	53.42
	SD	16.02	12.67	15.34	16.17	17.70
	SEM	0.92	0.72	0.88	0.92	1.01
Very Remote	Number	160.00	160.00	160.00	160.00	160.00
	Mean	60.28	45.71	43.98	63.62	54.93
	SD	14.02	13.18	14.09	15.49	15.58
	SEM	1.11	1.04	1.11	1.22	1.23
Difficult	Number	141	141	141	141	141
	Mean	56.16	47.37	44.02	65.01	57.50
	SD	14.68	11.94	15.05	13.18	15.68
	SEM	1.24	1.01	1.27	1.11	1.32
Total	Number	1097.00	1097.00	1097.00	1097.00	1097.00
	Mean	55.48	46.86	43.33	61.35	54.47
	SD	15.73	13.24	15.12	16.07	17.16
	SEM	0.47	0.40	0.46	0.49	0.52

Annexure 16: Performance of students in various Type of schools

Type		Dzongkha	English	Mathematics	Science	Social Studies
Public	Number	1066.00	1066.00	1066.00	1066.00	1066.00
	Mean	55.30	46.38	42.83	60.94	54.03
	SD	15.80	13.02	14.89	15.98	17.09
	SEM	0.48	0.40	0.46	0.49	0.52
Private	Number	31.00	31.00	31.00	31.00	31.00
	Mean	61.65	63.32	60.50	75.37	69.60
	SD	11.55	10.19	12.83	12.63	12.08
	SEM	2.07	1.83	2.30	2.27	2.17

Annexure 17: Performance of students in various Level of schools

Level		Dzongkha	English	Mathematics	Science	Social Studies
PS	N	577.00	577.00	577.00	577.00	577.00
	Mean	59.01	48.56	45.12	63.37	57.37
	SD	14.70	12.86	14.99	14.92	16.47
	SEM	0.61	0.54	0.62	0.62	0.69
LSS	N	195.00	195.00	195.00	195.00	195.00
	Mean	52.44	45.96	40.92	59.80	51.82
	SD	15.79	12.72	14.06	16.79	17.85
	SEM	1.13	0.91	1.01	1.20	1.28

Level		Dzongkha	English	Mathematics	Science	Social Studies
MSS	N	124.00	124.00	124.00	124.00	124.00
	Mean	48.72	43.83	41.96	59.20	51.14
	SD	17.06	14.95	16.18	17.23	18.67
	SEM	1.53	1.34	1.45	1.55	1.68
HSS	N	26.00	26.00	26.00	26.00	26.00
	Mean	52.19	50.37	46.98	61.29	56.52
	SD	19.50	12.72	15.62	19.56	16.34
	SEM	3.82	2.49	3.06	3.84	3.20
CS	N	175	175	175	175	175
	Mean	52.50	43.85	40.51	57.97	49.89
	SD	14.48	12.96	15.06	16.72	15.85
	SEM	1.09	0.98	1.14	1.26	1.20

Annexure 18: Gender performance across Five subjects

Gender		Dzongkha	English	Mathematics	Science	Social Studies
Male	N	519.00	519.00	519.00	519.00	519.00
	Mean	52.58	45.49	43.71	61.20	54.20
	SD	15.87	12.62	15.12	16.46	16.95
	SEM	0.70	0.55	0.66	0.72	0.74
Female	N	578	578	578	578	578
	Mean	58.08	48.09	42.99	61.49	54.71
	SD	15.15	13.67	15.12	15.73	17.35
	SEM	0.63	0.57	0.63	0.65	0.72

Annexure 19: Gender performance in various Dzongkhag and Thromdes

		Male					Female				
		Dzo	Eng	Mat`	Sci	SS	Dzo	Eng	Mat`	Sci	SS
Bumthang	N	17.00	17.00	17.00	17.00	17.00	18.00	18.00	18.00	18.00	18.00
	Mean	56.15	51.53	42.71	60.79	58.97	55.97	42.63	37.97	52.22	48.72
	SD	16.81	11.35	11.93	16.10	14.38	9.53	11.13	10.94	16.73	19.55
	SEM	4.08	2.75	2.89	3.90	3.49	2.25	2.62	2.58	3.94	4.61
Chukha	N	35.00	35.00	35.00	35.00	35.00	39.00	39.00	39.00	39.00	39.00
	Mean	49.81	41.75	37.51	56.33	49.59	55.29	46.01	39.19	58.72	50.44
	SD	18.24	15.80	15.21	19.49	18.91	16.26	12.65	12.95	13.77	15.25
	SEM	3.08	2.67	2.57	3.29	3.20	2.60	2.03	2.07	2.20	2.44
Dagana	N	31.00	31.00	31.00	31.00	31.00	37.00	37.00	37.00	37.00	37.00
	Mean	48.27	45.13	40.52	62.02	57.27	55.76	48.51	41.31	62.91	57.64
	SD	17.83	12.84	14.43	16.15	19.12	17.17	13.28	15.52	14.91	18.29
	SEM	3.20	2.31	2.59	2.90	3.43	2.82	2.18	2.55	2.45	3.01
Gasa	N	8.00	8.00	8.00	8.00	8.00	7.00	7.00	7.00	7.00	7.00
	Mean	47.94	46.44	50.56	61.69	54.38	46.79	43.46	49.64	61.71	48.64
	SD	14.29	13.99	16.92	17.23	16.19	19.14	19.66	18.32	17.34	17.37
	SEM	5.05	4.95	5.98	6.09	5.72	7.23	7.43	6.92	6.55	6.57
Gelephu Thromde	N	4.00	4.00	4.00	4.00	4.00	6.00	6.00	6.00	6.00	6.00

		Male					Female				
		Dzo	Eng	Mat`	Sci	SS	Dzo	Eng	Mat`	Sci	SS
	Mean	36.88	41.06	65.88	57.38	61.00	47.08	51.63	44.50	72.08	73.50
	SD	18.96	16.02	19.50	20.99	17.54	21.78	17.96	16.08	18.18	19.13
	SEM	9.48	8.01	9.75	10.50	8.77	8.89	7.33	6.57	7.42	7.81
Haa	N	12.00	12.00	12.00	12.00	12.00	16.00	16.00	16.00	16.00	16.00
	Mean	51.71	48.35	48.13	63.29	55.21	64.81	55.31	46.66	66.97	60.59
	SD	11.58	10.07	15.69	13.85	13.91	14.01	14.07	15.38	14.68	16.98
	SEM	3.34	2.91	4.53	4.00	4.02	3.50	3.52	3.84	3.67	4.24
Lhuentse	N	14.00	14.00	14.00	14.00	14.00	21.00	21.00	21.00	21.00	21.00
	Mean	60.86	51.04	47.61	70.07	65.61	60.29	41.89	42.24	57.90	53.93
	SD	10.61	9.36	8.61	11.53	11.98	17.71	21.06	13.55	20.21	22.46
	SEM	2.84	2.50	2.30	3.08	3.20	3.87	4.60	2.96	4.41	4.90
Mongar	N	34.00	34.00	34.00	34.00	34.00	35.00	35.00	35.00	35.00	35.00
	Mean	61.03	46.41	40.87	65.45	58.71	59.49	46.73	40.26	58.89	52.14
	SD	14.08	14.53	12.96	17.10	17.87	11.15	9.47	16.61	13.70	13.70
	SEM	2.42	2.49	2.22	2.93	3.06	1.89	1.60	2.81	2.32	2.32
Paro	N	27.00	27.00	27.00	27.00	27.00	25.00	25.00	25.00	25.00	25.00
	Mean	52.02	46.72	42.04	58.28	53.43	56.44	55.06	43.64	64.90	57.76
	SD	16.01	14.39	14.79	16.60	17.81	11.90	14.93	17.92	15.51	17.74
	SEM	3.08	2.77	2.85	3.20	3.43	2.38	2.99	3.58	3.10	3.55
Pema Gatshel	N	28.00	28.00	28.00	28.00	28.00	26.00	26.00	26.00	26.00	26.00
	Mean	58.25	48.93	48.93	65.61	59.66	62.17	45.38	45.96	61.63	52.54
	SD	16.48	12.92	18.23	16.98	15.48	13.43	11.67	13.26	13.58	16.09
	SEM	3.11	2.44	3.45	3.21	2.93	2.63	2.29	2.60	2.66	3.15
Phuentsholing Thromde	N	9.00	9.00	9.00	9.00	9.00	11.00	11.00	11.00	11.00	11.00
	Mean	51.06	44.61	43.72	58.72	44.22	53.32	47.86	47.14	60.91	52.05
	SD	9.27	11.62	16.35	22.02	20.29	21.20	14.46	21.21	28.18	23.09
	SEM	3.09	3.87	5.45	7.34	6.76	6.39	4.36	6.39	8.50	6.96
Punakha	N	19.00	19.00	19.00	19.00	19.00	21.00	21.00	21.00	21.00	21.00
	Mean	55.24	44.45	37.63	56.09	48.08	66.29	51.60	42.48	64.00	54.86
	SD	14.07	9.29	12.47	13.97	13.14	11.52	12.61	16.42	15.40	13.75
	SEM	3.23	2.13	2.86	3.21	3.01	2.51	2.75	3.58	3.36	3.00
Samdrup Jongkhar	N	21.00	21.00	21.00	21.00	21.00	24.00	24.00	24.00	24.00	24.00
	Mean	49.79	42.74	41.07	64.60	54.83	55.60	45.02	44.13	60.75	50.98
	SD	16.74	13.64	16.49	17.96	19.44	18.15	13.58	12.89	17.39	18.02
	SEM	3.65	2.98	3.60	3.92	4.24	3.70	2.77	2.63	3.55	3.68
Samdrup Jongkhar Thromde	N	3.00	3.00	3.00	3.00	3.00	1.00	1.00	1.00	1.00	1.00
	Mean	56.33	49.33	38.33	63.67	46.67	71.50	56.00	53.00	81.00	60.00
	SD	17.03	10.10	8.81	14.87	17.50					
	SEM	9.83	5.83	5.09	8.58	10.11					
Samtse	N	43.00	43.00	43.00	43.00	43.00	36.00	36.00	36.00	36.00	36.00
	Mean	40.84	41.64	40.71	59.02	49.88	49.35	47.93	38.47	63.11	56.86

		Male					Female				
		Dzo	Eng	Mat`	Sci	SS	Dzo	Eng	Mat`	Sci	SS
	SD	12.75	9.28	14.20	14.16	16.26	13.31	12.83	12.42	13.18	15.84
	SEM	1.94	1.41	2.16	2.16	2.48	2.22	2.14	2.07	2.20	2.64
Sarpang	N	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00
	Mean	47.92	42.00	40.15	60.85	48.71	50.06	43.44	39.60	56.10	48.25
	SD	14.69	10.61	13.76	15.27	15.48	15.29	11.87	14.85	15.66	16.48
	SEM	3.00	2.16	2.81	3.12	3.16	3.12	2.42	3.03	3.20	3.36
Thimphu Thromde	N	32.00	32.00	32.00	32.00	32.00	29.00	29.00	29.00	29.00	29.00
	Mean	52.72	54.23	51.77	63.17	58.23	61.19	61.26	50.50	69.38	64.81
	SD	14.48	11.80	15.05	16.52	17.12	17.92	13.68	15.20	15.86	15.95
	SEM	2.56	2.09	2.66	2.92	3.03	3.33	2.54	2.82	2.95	2.96
Thimphu	N	13.00	13.00	13.00	13.00	13.00	18.00	18.00	18.00	18.00	18.00
	Mean	49.00	41.92	46.65	53.85	53.88	54.44	47.03	33.14	58.00	56.36
	SD	15.19	14.36	17.05	16.65	18.43	12.04	15.07	13.13	12.24	12.64
	SEM	4.21	3.98	4.73	4.62	5.11	2.84	3.55	3.09	2.89	2.98
Trashigang	N	40.00	40.00	40.00	40.00	40.00	56.00	56.00	56.00	56.00	56.00
	Mean	58.71	43.39	43.38	60.85	54.39	63.94	46.65	44.47	64.32	57.62
	SD	11.94	9.52	13.35	13.97	14.13	13.46	13.37	14.46	14.49	16.31
	SEM	1.89	1.51	2.11	2.21	2.23	1.80	1.79	1.93	1.94	2.18
Trashiyangtse	N	23.00	23.00	23.00	23.00	23.00	36.00	36.00	36.00	36.00	36.00
	Mean	60.46	44.20	43.22	62.65	52.83	63.22	49.53	48.21	62.47	55.04
	SD	10.11	10.08	16.48	16.51	16.18	12.66	11.08	18.09	15.76	19.54
	SEM	2.11	2.10	3.44	3.44	3.37	2.11	1.85	3.02	2.63	3.26
Trongsa	N	14.00	14.00	14.00	14.00	14.00	16.00	16.00	16.00	16.00	16.00
	Mean	58.79	47.68	45.11	60.93	55.64	62.69	47.92	46.03	62.31	55.50
	SD	12.71	10.11	10.46	15.55	14.15	12.00	7.01	8.34	15.09	14.49
	SEM	3.40	2.70	2.80	4.16	3.78	3.00	1.75	2.08	3.77	3.62
Tsirang	N	21.00	21.00	21.00	21.00	21.00	19.00	19.00	19.00	19.00	19.00
	Mean	49.36	43.81	45.90	57.79	54.24	56.37	52.68	39.50	63.47	57.16
	SD	20.58	17.55	14.35	21.37	19.87	16.10	12.49	11.78	14.38	16.19
	SEM	4.49	3.83	3.13	4.66	4.34	3.69	2.86	2.70	3.30	3.71
Wangduepho-drang	N	28.00	28.00	28.00	28.00	28.00	37.00	37.00	37.00	37.00	37.00
	Mean	50.80	46.52	49.80	61.27	51.54	57.14	45.82	43.23	55.16	51.05
	SD	13.60	12.26	15.28	16.61	18.03	14.07	12.83	16.74	15.61	18.23
	SEM	2.57	2.32	2.89	3.14	3.41	2.31	2.11	2.75	2.57	3.00
Zhemgang	N	19.00	19.00	19.00	19.00	19.00	20.00	20.00	20.00	20.00	20.00
	Mean	53.03	43.05	42.18	64.05	53.29	57.83	43.58	46.55	61.08	47.50
	SD	19.65	11.81	17.88	16.07	15.20	13.15	13.04	14.69	15.81	18.80
	SEM	4.51	2.71	4.10	3.69	3.49	2.94	2.92	3.28	3.54	4.20

Annexure 20: Performance of students in various Type of schools

Type		Dzongkha	English	Mathematics	Science	Social Studies
Public	N	1066.00	1066.00	1066.00	1066.00	1066.00

Type		Dzongkha	English	Mathematics	Science	Social Studies
	Mean	55.30	46.38	42.83	60.94	54.03
	SD	15.80	13.02	14.89	15.98	17.09
	SEM	0.48	0.40	0.46	0.49	0.52
Private	N	31.00	31.00	31.00	31.00	31.00
	Mean	61.65	63.32	60.50	75.37	69.60

Annexure 21: Performance in Dzongkha across Three Strands

	Weightage	N	Mean	Weighted mean	SD
Writing	30	1097	17.72	59.07	3.66
Grammar	20	1097	13.42	67.08	4.26
Reading	60	1097	24.34	40.57	9.88
Valid N (listwise)		1097			

Annexure 22: Performance in English across Three Strands

	N	Weightage	Missing	Weighted mean	Mean	SEM	SD
Writing	1097	30	0	45.63	13.69	0.13	4.47
Grammar	1097	20	0	47.2	9.42	0.12	3.86
Reading	1097	100	0	37.01	37.01	0.30	9.84

Annexure 23: Gender performance in Dzongkha across Three Strands

Gender		Weightage	N	Mean	Weighted mean	SD	SEM
Male	Writing	30	518	17.07	56.90	3.96	0.17
	Grammar	20	518	13.00	65.00	4.30	0.19
	Reading	60	518	22.47	37.45	9.88	0.43
Female	Writing	30	579	18.30	61.00	3.26	0.14
	Grammar	20	579	13.78	68.9	4.20	0.17
	Reading	60	579	26.02	43.37	9.59	0.40

Annexure 24: Gender performance in English across Three Strands

Gender		N	Weightage	Mean	Weighted mean	SD	SEM
Male	Writing	519	30	13.08	43.59	4.18	0.18
	Grammar	519	20	9.22	46.10	3.75	0.16
	Reading	519	100	36.36	36.36	9.37	0.41
Female	Writing	578	30	14.24	47.46	4.65	0.19
	Grammar	578	20	9.59	47.95	3.95	0.16
	Reading	578	100	37.59	37.59	10.21	0.42

Annexure 25: Performance in Mathematics across Four Strands

Strands	Weightage	N	Mean	Weighted Mean	SEM	SD
Number and relationship	37	1094	14.89	40.23	0.19	6.38
Pattern and Operation	18	1094	4.78	26.54	0.10	3.18

Strands	Weightage	N	Mean	Weighted Mean	SEM	SD
Measure-ment	25	1094	13.5	52.59	0.12	3.89
Data and Probability	20	1094	5.86	29.30	0.07	2.46

Annexure 26: Gender performance in Mathematics across Four Strands

Strands	Weightage	Male					Female				
		N	Mean	Weighted Mean	S D	SEM	N	Mean	Weighted Mean	SD	SEM
Number and relationship	37	517.00	14.95	40.41	6.33	0.28	577	14.83	40.07	6.43	0.27
Pattern and operation	18	517.00	4.82	26.78	3.31	0.15	577	4.74	26.32	3.06	0.13
Measurement and geom-etry	25	517.00	13.23	52.93	3.91	0.17	577	13.07	52.28	3.87	0.16
Data and probability	20	517.00	5.90	29.48	2.48	0.11	577	5.83	29.13	2.45	0.10

Annexure 27: Performance in Science across Twelve Chapters

Chapter	Weightage	Number	Mean	Weighted Mean	SEM	SD
Elements acids alkalis	8.00	1097.00	6.15	76.87	0.05	1.56
Chemical change	7.00	1097.00	4.57	65.28	0.06	1.96
Separating mixture	9.00	1097.00	6.20	68.88	0.05	1.70
Mass and weight	4.00	1097.00	1.95	48.75	0.03	1.03
Light and sound	9.00	1097.00	5.63	62.55	0.06	1.96
Electricity and mag-netism	8.00	1097.00	4.75	59.37	0.06	1.85
Living things and their environment	9.00	1097.00	4.95	55.00	0.05	1.82
Green plants	10.00	1097.00	4.74	47.4	0.07	2.30
Classification of animals	9.00	1097.00	6.04	67.11	0.05	1.50
Diet and human system	10.00	1097.00	5.22	52.20	0.07	2.17
Work and energy	10.00	1097.00	6.70	67.00	0.06	2.13
Earth moon and the Sun	7.00	1097.00	4.47	63.85	0.05	1.66
Valid N (listwise)		1097				

Annexure 28: Gender performance in Science across Twelve Chapters

Chapter	Weightage	Male					Female				
		Mean	N	SD	Weighted Mean	SEM	Mean	N	SD	Weighted Mean	SEM
Elements, acids alkalis	8.00	6.06	518.00	1.55	75.75	0.07	6.23	579.00	1.57	77.94	0.07
Chemical change	7.00	4.52	518.00	1.95	64.57	0.09	4.61	579.00	1.96	65.80	0.08

Chapter	Weightage	Male					Female				
		Mean	N	SD	Weighted Mean	SEM	Mean	N	SD	Weighted Mean	SEM
Separating mixture	9.00	6.11	518.00	1.76	67.88	0.08	6.28	579.00	1.65	69.80	0.07
Mass and weight	4.00	1.91	518.00	1.05	47.83	0.05	1.99	579.00	1.02	49.74	0.04
Light and souncd	9.00	5.61	518.00	1.99	62.34	0.09	5.64	579.00	1.94	62.70	0.08
Electricity and magnetism	8.00	4.85	518.00	1.83	60.63	0.08	4.65	579.00	1.87	58.16	0.08
Living things and their environment	9.00	4.94	518.00	1.81	54.94	0.08	4.96	579.00	1.84	55.06	0.08
Green plants	10.00	4.66	518.00	2.33	46.64	0.10	4.80	579.00	2.27	48.01	0.09
Classification of animals	9.00	6.09	518.00	1.50	67.64	0.07	6.00	579.00	1.50	66.71	0.06
Diet and human system	10.00	5.14	518.00	2.23	51.36	0.10	5.29	579.00	2.11	52.87	0.09
Work and energy	10.00	6.70	518.00	2.19	66.96	0.10	6.70	579.00	2.07	67.00	0.09
Earth moon and the Sun	7.00	4.49	518.00	1.68	64.11	0.07	4.45	579.00	1.65	63.51	0.07

Annexure 29: Performance in Social Studies across Three Units

Chapter	Weightage	Number	Mean	Weighted Mean	SEM	SD
The environment	34	1097.00	15.48	45.52	0.15	5.06
People and places	38	1097.00	25.46	67.00	0.38	12.54
Society	28	1097.00	13.88	49.57	0.17	5.57

Annexure 30: Gender performance in Social Studies across Three Units

Chapter	Weightage	Male					Female				
		Mean	N	SD	Weighted Mean	SEM	Mean	N	SD	Weighted Mean	SEM
The environment	34	15.75	518.00	5.01	46.32	0.22	15.75	518.00	5.01	46.32	0.22
People and places	38	25.54	518.00	15.71	67.20	0.69	25.54	518.00	15.71	67.20	0.69
Society	28	13.61	518.00	6.44	48.59	0.28	13.61	518.00	6.44	48.59	0.28

Annexure 31: Discrepancy of scores between School and Central level evaluation

Score	Dzongkha		English		Mathematics		Science		Social Studies	
	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)
Equal	18	1.64	23	2.10	56	5.12	89	8.11	73	6.65
Low	132	12.03	79	7.21	205	18.74	272	24.79	224	20.42
High	947	86.33	994	90.69	833	76.14	736	67.09	800	72.93
	1097	100.00	1096	100.00	1094	100.00	1097	100.00	1097	100.00

Annexure 32: Overall performance trend (2016–2017)

	2016	2017	2018
Dzongkha	59.12	57.96	55.48
English	47.72	54.33	46.86
Mathematics	41.27	35.33	43.33
Science	54.01	52.31	61.35
Social Studies	51.19	55.83	54.47

Annexure 33: Performance trend across Dzongkhags and Thromdes (2016–2017)

Dzongkhags	Dzongkha			Mathematics			English			Science			Social Studies		
	2016	2017	2018	2016	2017	2018	2016	2017	2018	2016	2017	2018	2016	2017	2018
Bumthang	60.27	60.97	56.06	44.63	54.94	46.95	40.07	36.01	40.27	53.76	52.34	56.39	50.54	56.98	53.70
Chukha	57.38	52.71	52.70	48.84	53.16	43.99	44.3	30.75	38.40	54.05	50.59	57.59	51.31	54.1	50.03
Dagana	56.64	52.77	52.35	45.7	49.34	46.97	37.31	30.86	40.95	51.91	49.92	62.50	48.54	52.86	57.47
Gasa	69.27	57.59	47.40	47.22	47.12	45.05	36.87	31.7	50.13	50.21	43.7	61.70	47.04	47.37	51.70
Haa	61.77	62.79	59.20	45.23	57.67	52.33	37.91	35.08	47.29	53.93	54.42	65.39	49.49	58.21	58.29
Lhuentse	73.16	65.27	60.51	56.57	56.56	45.55	49.47	43.52	44.39	61.4	49.73	62.77	61.42	63.92	58.60
Mongar	63.73	61.85	60.25	44.05	53.02	46.57	39.01	35.23	40.56	52.09	51.23	62.12	46.65	53.47	55.38
Paro	60.7	55.43	54.14	50.68	55.02	50.73	44.18	31.89	42.81	55.69	49.43	61.46	54.2	55.04	55.51
Pema Gatshel	63.69	61.11	60.14	47.88	54.24	47.22	39.91	33.67	47.50	53.54	49.64	63.69	50.18	54.99	56.23
Phuentsholing Thromde	54.03	50.91	52.30	47.5	54.85	46.40	39.65	34.91	45.60	52.01	52.32	59.93	50.61	56.4	48.53
Punakha	60.91	58.18	61.04	49.92	51.01	48.21	44.09	33.98	40.18	55.26	50.97	60.24	53.52	50.27	51.64
Samdrup Jongkhar	59.65	58.21	52.89	44.88	51.91	43.96	39.49	34.32	42.70	52.27	50.17	62.54	48.21	52.81	52.78
S/Jongkhar Thromde	62.23	64.01	60.13	43.72	54.31	51.00	36.26	32.1	42.00	56.87	60.6	68.00	49.33	53.63	50.00
Samtse	45.63	49.58	44.72	43.46	52.28	44.51	36.84	35.92	39.69	49.75	52.78	60.89	44.71	53.44	53.06
Sarpang	58.03	60.63	48.99	54.22	55.15	42.72	47.19	36.76	39.88	57.34	53.52	58.48	58.34	57.89	48.48
Thimphu Thromde	59.37	58.05	56.75	50.36	59.73	57.57	44.15	38.79	51.16	57.39	55.75	66.12	54.82	60.35	61.36
Thimphu	60.3	59.91	52.16	49.16	54.22	44.89	39.39	33.62	38.81	50.42	50.46	56.26	52.48	56.54	55.32
Trashigang	66.71	61.96	61.76	47.92	52.6	45.29	42.02	37.66	44.02	54.31	53.25	62.88	54.35	55.98	56.27
Trashiyangtse	61.96	66.3	62.14	46.12	54.71	47.45	40.01	34.83	46.26	53.97	52	62.54	49.5	56.89	54.18
Trongsa	63.53	64.57	60.87	45.95	59.66	47.81	41.7	36.22	45.60	58.15	53.08	61.67	46.79	53.49	55.57
Tsirang	60.63	57.51	52.69	52.66	58.49	48.03	43.18	34.19	42.86	58.24	53.61	60.49	56.04	60.97	55.63
Wangduepho-drang	59.86	57.7	54.41	42.58	51.2	46.12	37.27	33.71	46.06	46.91	50.06	57.79	45.69	53.39	51.26
Zhemgang	60.2	63.57	55.49	46.68	53.61	43.32	37.73	36.61	44.42	49.65	54.86	62.53	46.2	56.23	50.32

Annexure 34: Gender performance trend (2016–2017)

Subjects	2016 (baseline)		2017		2018	
	Female	Male	Female	Male	Female	Male
Dzongkha	62.19	55.87	60.93	54.76	58.08	52.58
English	49.25	46.09	56.29	52.21	48.09	45.49
Mathematics	41.25	41.29	35.59	35.05	42.99	43.71
Science	53.98	54.04	52.47	52.13	61.49	61.2

Subjects	2016 (baseline)		2017		2018	
	Female	Male	Female	Male	Female	Male
Social Studies	51.74	50.61	56.33	55.28	54.71	54.2

Annexure 35: Sample design table for roh value of 0.3

Cluster size	95% confidence limits for means/percentages							
	±0.05s/±2.5%		±0.1s/±5.0%		±0.15s/±7.5%		±0.2s/±10.0%	
b	a	n	a	n	a	n	a	n
1 (SRS)	1600	1600	400	400	178	178	100	100
2	880	1760	220	440	98	196	55	110
5	448	2240	112	560	50	250	28	140
10	304	3040	76	760	34	340	19	190
15	256	3840	64	960	29	435	16	240
20	232	4640	58	1160	26	520	15	300
30	208	6240	52	1560	24	720	13	390
40	196	7840	49	1960	22	880	13	520
50	189	9450	48	2400	21	1050	12	600

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