Current Status of the National Assessment System in Bhutan

A Study Report on Learning Enablers for Asia and Pacific (LEAP) Programme

UNESCO's *Learning Enablers for Asia and Pacific (LEAP) Programme*

2015-2016

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1. Introduction

1.1 Brief socio-economic and demographic profile of the country

Bhutan is a small landlocked nation, situated between China (Tibet) and India. It has an area of 38,394 square kilometers with the kingdom's longest east-west dimension stretching about 300 kilometers and 170 kilometers at its maximum north-south dimension. The population of the country is estimated at 716,896 (2012). Most part of the country is mountainous and the land elevation ranges from 160 metres above sea level in the south to more than 7550 metres in the north. About 70.5 percent of the land surface is covered with forests; around seven percent with year-round snow and glaciers; nearly three percent is cultivated or agriculture areas; and four percent comprises meadows and pastures, while rest of the land is either barren, rocky or scrubland. The average life expectancy in Bhutan is currently estimated at 67.75 (2011) years, with life expectancy for men little over 66.0 years and life expectancy for women at 66.2 years. This indicates the fact that the country has continued to experience declines in adult and child mortality rates. Primary health care coverage has also expanded and now covers well over 90% of the country's population.

Despite being landlocked, with difficult terrain and a widely dispersed population, Bhutan has made rapid socio-economic progress. The country's real annual economic growth averages about 7-8 per cent over the last two decades. The Gross Domestic Product per capita in Bhutan was last recorded at 2068.37 US dollars in 2014. The GDP per Capita in Bhutan is equivalent to 16 percent of the world's average. GDP per capita in Bhutan averaged 992.75 USD from 1980 until 2014, reaching all time high of 2068.37 USD in 2014 and a record low of 325.14 USD in 1980.

In recent years, Bhutan, with a primarily agrarian based economy, has experienced rapid economic growth. The economic sectors which have contributed significantly to this growth and transformation from a largely agricultural base are particularly hydropower, tourism, construction, trade and service sectors. These sectors have now become the main driving forces of the economy, with a share of GDP now as high as 40%.

Hydropower development and the export of surplus electricity to India has largely sustained this robust growth and fundamentally transformed the structure of Bhutan's economy. Through prudent macro-economic management, the country is performing well and the Government's investment in social and human development has raised hopes of Bhutan meeting several of the Millennium Development Goals.

Bhutan's development has been guided by an original philosophy based on the concept of Gross National Happiness, striving to balance spiritual and material advancement through the four pillars: sustainable and equitable economic growth and development; preservation and sustainable use of the environment; preservation and promotion of cultural heritage; and good governance.

The otherwise an isolated country for several past decades, in economic and cultural terms, has undergone political reform with a democratically elected government and increased exposure of the country to outside influences in the form of trade, migration, education and tourism. After the first democratic elections were held in March 2008, Bhutan became a constitutional monarchy with a parliamentary democracy. The leader of the winning party (Druk PhunsumTshokpa), Jigme Y. Thinley, became the first democratically elected Prime Minister of Bhutan. The Fifth King, Jigme Khesar Namgyel Wangchuck, ascended to the throne in December 2006 and was officially crowned on 1st November, 2008. At present the country is ruled by People Democratic Party (PDP) under the leadership of his Excellency Lyonpo Tshering Tobgay, the prime minister of Bhutan.

1.2 Overview of school education system of the country
1.2.1 School Education Structure, Administration and Finance
Since 2000, the education sector has been working on the task of developing a strategic framework for education "Education Sector Strategy: Realizing the Vision 2020". It is an articulation of the goals and processes for achieving Bhutan's aspirations in the education sector as a part of the wider national development initiatives towards becoming a knowledge-based society and progressive sovereign nation.

The structure of Bhutanese education system in general consists of a day care system called early childhood care development (ECCD), seven years of primary (starting from Class PP to VI), four years of secondary (VII to X), and two years of higher secondary education (XI to XII) which terminates at the age of eighteen.

The basic education level at present is up to Class X which includes 11 years of free education until the age of sixteen (Primary +4 years of secondary or until the end of Class X). In the current education system, there are at least four key-stages of student learning (Classes III, VI, X and XII) and at the end of which children have to sit for the competency based assessment tests in case of Classes III and VI; and public examinations (high stake examinations) for Classes X and XII set by the Bhutan Council for School Examinations and Assessment (BCSEA).

Dzongkha is the national language which is taught at all levels of schooling, and for other subjects, English is used as the medium of instruction.

The anticipated successes of the education delivery will largely depend upon support mechanism such as strong financial and resources commitment of the government. The Government has always accorded a high priority to the education sector as the key agency to address the critical shortage of human resources in the country and improve the quality of life. Education has continued to receive a major share of the government budget (around 10%) since the start of First Five Year Plan in 1960s even in the face of other emerging priorities in the national development areas.

The country is guided by the vision to create Bhutan as a 'Knowledge Based Society' and the Royal Government accords high priority to the education sector by investing the highest budget allocation. The Government expenditure on education was measured at 4.65 of the total GDP in 2011 and 5.6 of the total GDP in 2013, according to the World Bank. The expenditure on education consists of current and capital public expenditure which includes government spending on educational institutions (both public and private), education administration, as well as subsidies for private entities (students/households and other privates entities). The table below shows capital budget outlay from 7th FYP to 11th FYP.

Table 1: Capital outlays 7th- 11th (1992-2018) and Education Sector Budget (Nu. in million)

	7th Plan	8th Plan	9th Plan	10th Plan	11th Plan
Year	(1992-1997)	(1997-2002)	(1997-2007)	(2007-2013)	(2013-2018)
Total Government Budget	15,590.70	34,981.70	70,000.00	73,611.76	92,000.00
Education Budget	1738.00	3,292.70	10,209.40	9,489.10	7438.74
% of Total Budget	11.10%	9.40%	14.50%	12.80%	8.01%

(*Source: GNHC, RGOB)* only capital budget outlay*

The Constitution of Bhutan ensures provision of free education services to all Bhutanese up to (Class X or 10th standards). The goal is to generate a holistic growth of every Bhutanese child to realize his/her full potential to be a socially useful and economically productive citizen with a deeper understanding of the universal values of peace, freedom, justice, fairness, equality and happiness. The country envisions that education systems prepare young people for the world of work, inculcate dignity of labour, and build competencies and confidence to brace the challenges. To this effect, students who are not selected for government-funded further education can continue their studies in private higher secondary schools or undergo vocational training in private training institutes, both of which are of course more cost-intensive. Since 2006, the Ministry of Education has in collaboration with private higher secondary schools initiated a continuing education programme to allow school dropouts the opportunity to improve their qualifications. Students who qualify are not only given free tuition, but they are also provided with various facilities (textbooks, sporting equipment, boarding facilities, etc.). However, during the last few years the policy trend worked towards cost-sharing with parents, especially with those who are in a position to do so. Accordingly, students studying in the urban areas have had to buy their own school supplies since 1993. Similarly in 2011, MoE diversified the secondary school curriculum and included vocational education in few schools so that the literate youth will leave the school with improved occupational competencies and employability.

The responsibility for the administration of education in Bhutan is shared by several institutions: the Ministry of Education (MoE), the Ministry of Labour and Human Resources (MoLHR), the Royal University of Bhutan (RUB), the Dzongkhags (districts) and the Gewogs (cluster of villages which constitute administrative blocks). The Ministry of Education is also linked to the Ministry

of Home and Cultural Affairs regarding instructing the Driglam Namzha (Bhutanese etiquette) along with organizing other cultural activities in schools, to the Ministry of Agriculture for Agricultural programmes, and to the Central Monastic Body for religious education in the middle and higher secondary schools.

The Ministry of education is responsible for national level policy planning, administration of primary to higher secondary education and continuing education but however the actual management of the school at grass-root level is decentralized to the dzongkhags (districts) and schools. It is responsible for selecting students for international scholarship, for designing and implementing Higher Education policy and liaising with other stake holders such as Royal Education Council (REC), RUB and BCSEA.

All schools have a uniform governance and management structure. Schools also follow standard management procedure including goal setting strategies, implementing plans, monitoring of plans, review and assessment and recording and reporting. However, the effectiveness and efficiency of the structure and the process varies from one school to another.

1.2.2 Enrolment trend over the past five years

Access in education refers to the way in which educational institutions and policies ensure that students have equal opportunity to take full advantage of their education. The system aims to provide access to the entire Bhutanese children at all levels to realize their potential. Despite the challenges posed by geographical location, socio-economic background, economic status, disability, academic performance, resource and infrastructure constrains, the strategies for increasing access in 2014 have succeeded greatly in improving the enrolment rates. The gross primary enrolment rate has now increased to 113% and the net primary enrolment rate has increased to 96%.

The country is close to meeting universal enrolment in the primary level at 96% and secondary level at 85% in the year 2014. The net enrolment ratio for the higher secondary education (Classes X and XII) currently stands at 27 percent and the gross enrolment ratio at the tertiary level is estimated at 24% as of 2014. The overall literacy rate of today stands at 63%.

This success can be attributed to the strategies of establishing small community primary schools, the provision of school feeding for children who have to walk long distances to school and who are from poverty pockets, as well as provision of boarding facilities in the central schools and free stationeries.

However, at least 1.2 percent or about 1,059 six-year-olds are out of school, according to the annual education statistics 2015.These children include those in remote and hard to reach areas, children of nomadic communities and migrant populations, children with learning disabilities whose special learning needs are currently not catered for, dropouts and children of the urban poor (Kuensel, October12, 2015).

Table 2 presents the key education indicators for access to education, Gross Primary Enrolment Ratio (GPER), Net Primary Enrolment Rate (NPER), Gender Parity Index and Adjusted Net Primary Enrolment Rate (ANER).

Table 2:   Primary Enrolment Rates 2008-2014 (Annual Education Statistics, MoE)

Year	Net Primary Enrolment				GPI
	Gross Enrolment Ratio	Male	Female	Total	
2014	113%	96%	94%	95%	0.98
2013	116%	95%	96%	96%	1.01
2012	118%	95%	96%	96%	1.02
2011	120%	94%	96%	95%	1.02
2010	118%	93%	95%	94%	1.02
2014	113%	96%	94%	95%	0.98

The Bhutanese education system has, over the years, produced the current work force in the country. Students continue to graduate through the school system to pursue higher education and return to workforce in the form of academicians and professionals. However, the main challenge facing the education sector as a whole is how to increase the proportion of students achieving high quality learning outcomes. The access to quality of education has always remained the centrepiece of public debate over the years.

The results from the high stake examinations indicated that the pass percentage in Class X and Class XII examinations have been very high, on an average around 90% for each level over the last 10 years. In terms of numbers, the number of students appearing these examinations has increased dramatically over the last 10 years. The number of students appearing for Class X examinations increased from 10404 students in 2011 to 11655 in 2014 and for Class XII from 9121 in 2013 to 10242 in 2014. However, the mean scores of the student performance in Classes X and XII are still below 75.00 percent.

In terms of the policies the increase in enrolment has resulted in increasing number of students completing higher secondary education. As can be seen from these numbers, more and more are now able to and have the opportunity of accessing to the higher stages of secondary education and proportion of them have achieved the expected learning outcomes.

1.2.3 Student performance by grade and gender for last 5 years

From the table 3 below, the overall results at the high stake examinations, girl's performance is better than boy's in Class XII and boy's performance is better than girl's in Class X. This indicates that there is no learning disparities among the genders.

Table 3: Performance by gender at different grade (Pupil Performance Report: BCSEA)

Year	Class X		Class XII	
	Male	Female	Male	Female
2014	94.60	92.93	87.83	88.58
2013	96	94	87	86.2
2012	97.53	96.19	85.88	87.78
2011	97.46	96.62	87.18	84.76

2. Large-scale Assessments and Policies

2.1 Current policies or framework that guide learning assessment

BCSEA erstwhile Bhutan Board of examinations was delinked form the parent Ministry of Education and become semi-autonomous in terms of governance and operation in 2011. As an internationally recognized educational assessment and monitoring agency it provides quality services to build the integrity and profile of the education system. It is mandated to drive quality and standard of student learning, to play a pivotal role in promoting quality and standard in curricula, to enhance teaching and learning through advocacy, policy advice and support, to specialize knowledge and skills, and services.

Following are the core thematic areas of BCSEA;

a) Conduct of secondary school examinations,
b) Assessment and monitoring of education,
c) Professional development in assessment,
d) Research and publications and
e) Consultancy services.

The core mandate of BCSEA as described in the strategic framework and also in assessment and examination draft policy framework that guide learning assessment are derived from the following:
a) creating research capability and assessment practices of international quality,
b) improving the standard of public examinations and assessment practices in schools,
c) monitoring through feedback and input regarding levels of student's learning,
d) providing professional development to principals, teachers and other personnel in the field of examinations and assessment,
e) conducting research into policies and programmes to improve the quality of student learning and teaching,
f) providing insight and support to study existing school-based assessment practices and strengthen the same,
g) developing and publishing research-based support materials to strengthen school based

process and practices,

h) providing examples of best practices,
i) conducting national and international conferences, seminars, symposia etc. in areas of assessment and
j) facilitating exchange programmes with other international institutes of repute.

In Bhutan, the national level testing of pupils has been the singular instrument used in the systematic measuring and monitoring of the performance of individual pupils, schools and the national education system. Pupil assessment forms an integral part of teaching and learning and thus, ultimately, an instrumental factor in improving the quality of education.

Historically, the primary aim of national testing was to create a standardized method of assessment with a significant impact on students' progress. It included national tests for the award of certificates at the end of the school such as in the case of Class X Bhutan Certificate of Secondary Education Examinations introduced in 2001, and also for the purpose of promotion or streaming at the end of an academic year. In 2006, the BCSEA took over the complete conduct of the Class XII examination, called Bhutan Higher Secondary Education Certificate Examination (BHSEC) from the Council for the Indian School Certificate Examinations (CISCE), New Delhi.

2.2 Types of existing large-scale international as well as National Assessments and main highlights of the assessment results

The large-scale national assessment in Bhutan is called National Education Assessment (NEA). NEAs are conducted based on the need and concern of a country for information on its education quality. BCSEA is responsible for conducting all activities related to assessment such as preparing test specifications, developing instruments, piloting, revising instruments, conducting final tests, doing analysis, generating reports and dissemination of findings. Normally, it takes at least two years to complete such an assessment.

National Education Assessment (NEA) as a system-wide assessment program is designed to investigate and monitor the 'health' of the education system. The main purposes are to provide:

❖ policy-makers with information to monitor standards over time, to monitor the impact of particular programmes, and to make decisions about resource allocation,
❖ schools and teachers with information about whole school, class and individual pupil performance so that they can make decisions about resource allocation and to support learning in the classroom and
❖ the national system with information that will help to compare its performance with the international standards.

BCSEA started to coordinate the National Education Assessment (NEA) of student learning and performance using standardized tests and questionnaires since 2002. The first NEA on Class VI Literacy (English) and Numeracy (Mathematics) was completed in 2004. The first NEA on Class VI Dzongkha was completed in 2006. The NEA for Class X Mathematics and English was completed in 2007. The second round of the NEA for Class VI Literacy and Numeracy was conducted in 2011 and the report published and disseminated in 2012. Subsequently, in 2013 the

NEA for Class X Mathematics Literacy and Class X English Literacy was conducted and the report is generated for disseminations to different stakeholders.

2.3 National Assessment selected for the purpose of LEAP programme

The National Education Assessment 2013 has been selected for the purpose of LEAP programme. The first round having been conducted in 2006, the NEA 2013 for Class X English literacy and Mathematics literacy was the second round of assessment in the same subjects and level. This was planned to assess the learning achievements in the two crucial subjects for those who were completing the basic education of 16 years of education.

NEA 2013 for Class X English literacy and Mathematics literacy aimed to:
   a. determine performance in English and Mathematics,
   b. relate performance to conditions or context,
   c. review curriculum development process, teaching pedagogy, resource allocation and policy based on the performance,
   d. compare with the 2006 assessment,
   e. measure abilities to solve problems based on cognitive, affective and cognitive domain of learning, and relate student achievements to the quality of Bhutanese education,
   f. relate student achievements to the quality of Bhutanese education,
   g. provide recommendations for improving the teaching-learning environment and
   h. provide recommendations for improving the design/development of curriculum

Out of the total of 114 secondary schools in the country, 61 were middle secondary schools and 53 higher secondary schools. Among them, 45 schools (25 middle secondary schools and 18 higher secondary schools and 2 private higher secondary schools) were randomly selected as the sample population for the NEA 2013 for Class X English literacy and Mathematics literacy tests.

To get a balanced representation of the population, the selection was based on:
   ❖ remoteness (urban, semi-urban, semi-rural, semi-remote or rural),
   ❖ ownership (government or private) and
   ❖ levels (middle or higher secondary schools).

The final sample consisted of 4 rural, 8 semi-remote, 7 semi-rural, 4 semi-urban and 22 urban schools across 20 Dzongkhags(districts) and 2 Thromdeys(cities). The target was to get at least 40% of the total student population of 11,104 in Class X to participate in the assessment conducted by means of tests and questionnaires. A total of 82 English teachers and 83 Mathematics teachers also responded to the teacher questionnaires.

A total of 45 test administrators were involved in the test administration for English literacy and Mathematics literacy NEA 2013 in 20 Dzongkhags(districts) and 2 Thromdeys(cities). The Orientation included familiarization of Test Manual which highlighted on the conduct of English literacy and Mathematics literacy tests. In addition to this, 3 forms were used. One was the Test Administration Form (TAF) in which the administrators needed to fill in with problems and

challenges encountered in the conduct of the tests. The other form was Teacher Tracking Form (TTF) where the test administrators were required to keep the record of all Class X English and Mathematics teachers who responded to Teachers Questionnaire. The final form was Student Tracking Form (STF) which was intended to keep the record of the students who appeared both the tests and Student Questionnaire. The tests administrators were responsible for the smooth conduct of NEA English Literacy and Mathematics Literacy tests and the questionnaire administration.

2.4   Analysis and use of assessment data

For purpose of UNESCO's LEAP programme the analysis of the secondary assessment data carried out in order to address the flowing few analytical questions:

i) What was the student's achievement at grade X on English literacy and Mathematic literacy based on   gender and age?
ii) What were the learning gaps based on socio economic conditions (urban vs rural, walking distance, parental occupation, etc.) that has influenced the learning achievement at grade X?
iii) How was the performance of the student varied at grade X based on the attitude towards the subjects?

2.4.1 Descriptive and inferential analysis of the test items

Table 4: Descriptive and inferential statistics of Mathematics Test

	N	Mean	Median	SD	Skew-ness	Kurtosis	SEM	Lower CI	Upper CI	Avg P value	Cronbach's (α)
All	5581	38.0	35.0	18.3	0.58	-0.33	0.24	37.6	38.5		
Boys	2710	39.9	38.0	18.7	0.46	-0.56	0.36	39.2	40.6	0.38	0.89
Girls	2871	36.2	33.5	17.6	0.70	-0.04	0.33	35.6	36.8		

Some descriptive and inferential statistics of the Mathematics test given in the table above represents the number of student taking the test out of 100 marks, the mean score, median, standard deviation, skew-ness and kurtosis, standard error of measurement, confidence intervals and the reliability and validity of the test items. Overall, item analysis showed great test validity with Cronbach's coefficient (α) of (0.89). In terms of item difficulty, the p-value of (0.38) suggested that items were difficult but acceptable within the abilities of the students.

Table 5: Descriptive and inferential statistics of English Test

	N	Mean	Median	SD	Skew-ness	Kurtosis	SEM	Lower CI	Upper CI	Avg P value	Cronbach's (α)
All	5523	34.72	34	10.4	0.44	0.21	0.14	34.4	35.0	0.35	0.84

Boys	2689	34.3	34	9.8	0.39	0.22	0.19	33.9	34.7	
Girls	2834	35.1	34	10.9	0.45	0.13	0.20	34.7	35.5	

Some descriptive statistics of the English test given in the table above represents the number of student taking the test out of 100 marks, the mean score, median, standard deviation, skew-ness and kurtosis, standard error of measurement, confidence intervals and the reliability and validity of the test items. Overall, item analysis showed great test validity with Cronbach's coefficient (α) of (0.84). In terms of item difficulty, the p-value of (0.35) suggested that items were difficult but acceptable within the abilities of the students.

2.4.2 Findings on the student's achievement based on gender and age

Table 6: Difference in girls- boys achievement in English and Mathematics

	Girls	Boys	Difference Girls-Boys	Statistical Significance
Mean Mathematics achievement	36.2	39.9	3.7	△
Mean overall English achievement	35.1	34.3	0.7	-
Mean Reading &Literature achievement	38.6	37.7	0.9	-
Mean Language achievement	26.6	26.5	0.1	-
Mean Writing achievement	39.8	39	0.8	-

The table above represents difference in girls-boys achievement in English and Mathematics. There is a statistical significance difference girls-boys achievement in the Mathematics. The boys had outperformed the girls in Mathematics. However, the achievement difference girls- boys in the reading and literature, language and writing is found very minimal.
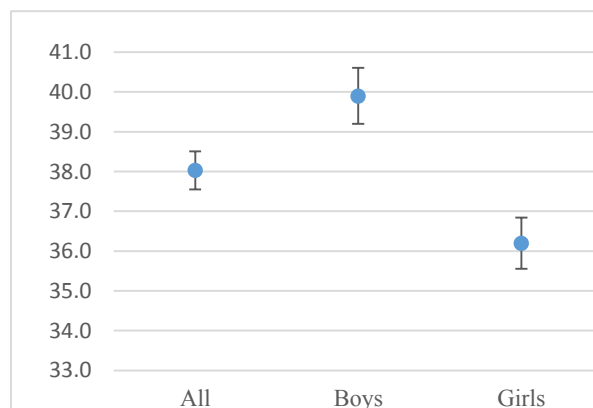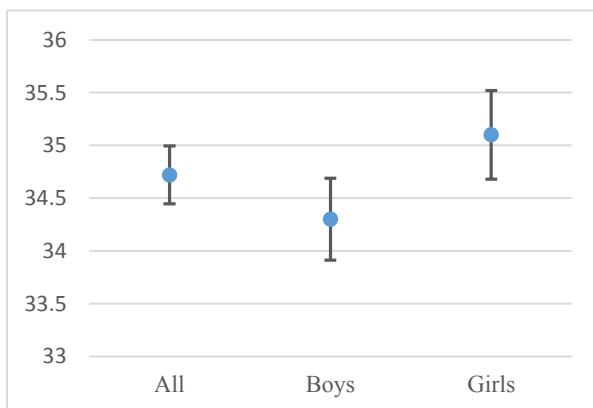
The figure above represents the mean score of boys and girls in English and Mathematics with 95% confidence interval.
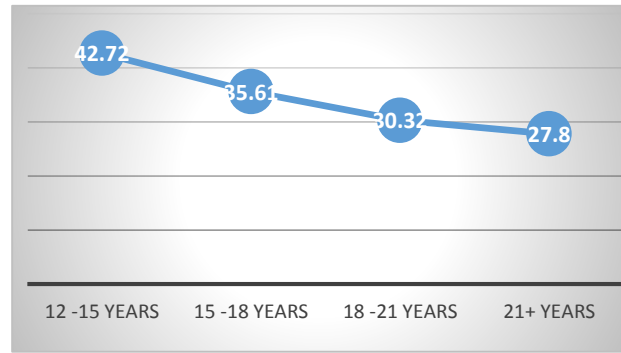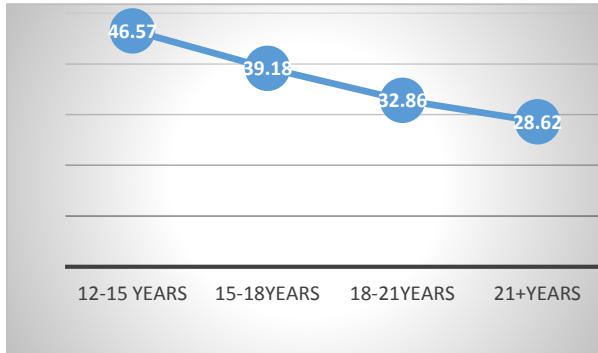

Figure 3: Age-wise performance in Mathematics   *Figure 4: Age-wise performance in English*

In the age-wise performance, the students in the age group of 12-15 years had better achievement in both English and Mathematics. As the age of the students increased the achievement appeared to proportionately decrease. The reason for this could be the school may have more effect at the younger age than on older age. Another plausible reason could be the students that have a lower ability repeats the classes. Thus, the older, delayed students, students are the students with lower ability than the regular students.

2.4.3 Finding on the student achievement based different contexts

Table 7: Mean achievement in English and Mathematics by different Dzongkhags

SL.NO	DZONGKHAG	MEAN(English)	(SME)	MEAN (Maths)	(SME)
1	Thimthrom	41.43	(1.7)	38.10	(1.5)
2	Chukha	38.60	(1.7)	41.34	(1.7)
3	Paro	38.54	(2.1)	44.32	(2.4)
4	Bumthang	38.03	(2.7)	36.38	(2.6)
5	Sarpang	36.03	(2.0)	40.38	(2.3)
6	Trashigang	35.51	(1.7)	38.84	(1.8)
7	Zhemgang	34.18	(2.6)	38.67	(3.0)
8	Punakha	34.11	(2.2)	37.44	(2.4)
9	Haa	33.77	(2.4)	35.02	(2.4)
10	Gasa	33.65	(4.7)	28.41	(4.0)
11	Tsirang	33.50	(2.8)	36.28	(3.0)
12	Samtse	33.45	(2.1)	35.98	(2.3)
13	Trongsa	33.06	(2.3)	35.21	(2.4)
14	Thimphu	32.99	(2.5)	25.80	(2.0)
15	Mongar	32.63	(1.7)	38.29	(2.1)
16	Pemagatshel	32.38	(1.8)	37.34	(2.1)
17	Lhuntse	32.33	(4.0)	46.45	(5.7)
18	Dagana	31.37	(2.1)	37.73	(2.5)
19	Trashiyangtse	30.82	(2.3)	45.28	(3.3)

| 20 | W/phodrang | 30.78 | (1.9) | 42.82 | (2.7) |
| 21 | S/jongkhar | 27.47 | (1.9) | 33.14 | (2.3) |

The table above represent mean and standard error of measurement achievement in English and Mathematics by different dzongkhags (districts). The students of Thrimthorm (Thimphu city) has performed better than the students of other district in English .However, the students of Trashiyangtse district has outperformed in Mathematics than other district.
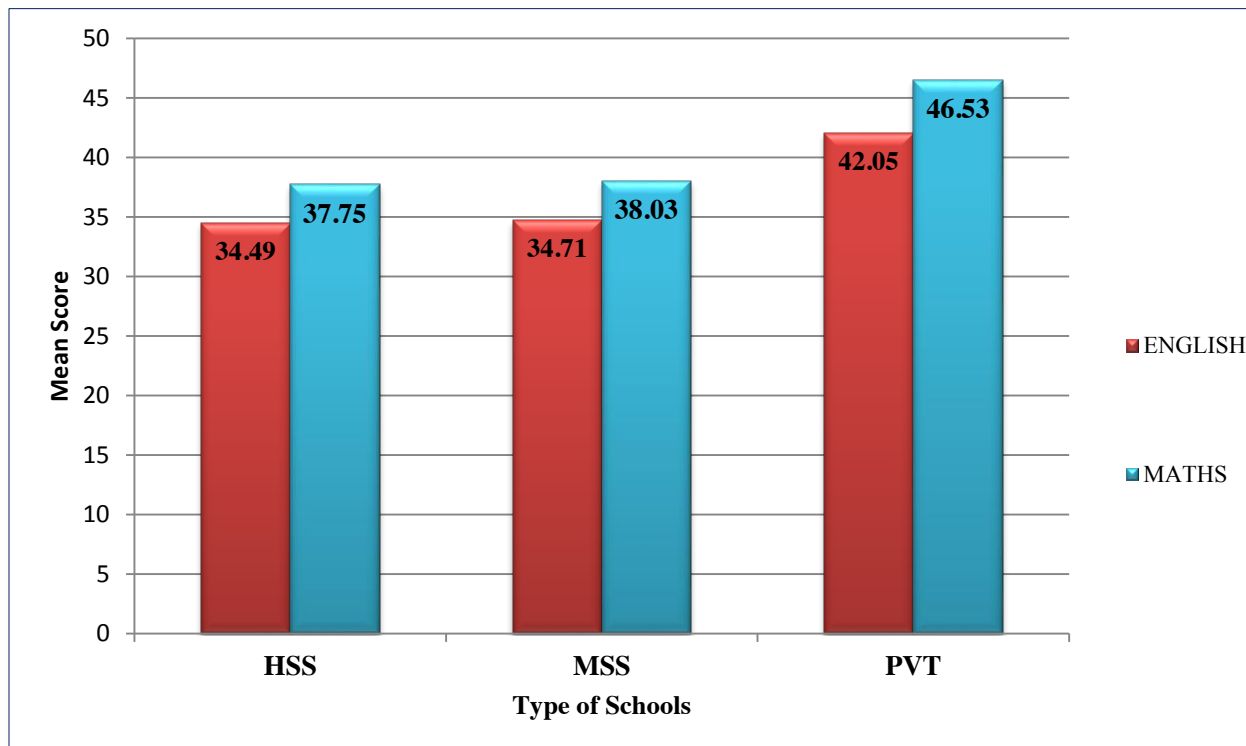

Figure 5: Performance in Mathematics and English by type of schools

The students of higher secondary schools had performed better than those of the middle secondary schools although the performance of the students in private school better than those of the government schools.
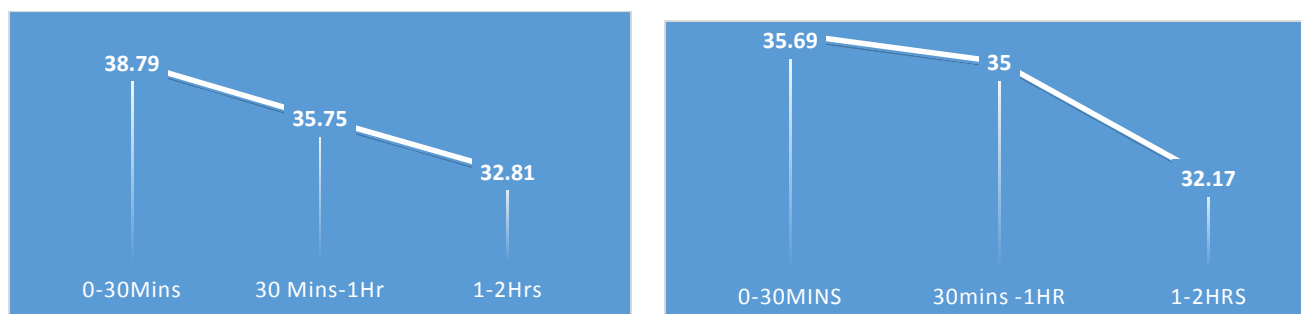
The results clearly indicated that students who had to walk less than 30 minutes to schools performed better than those who took more time walking to schools. Walking distance from the home had greater effect on the achievement of the students.
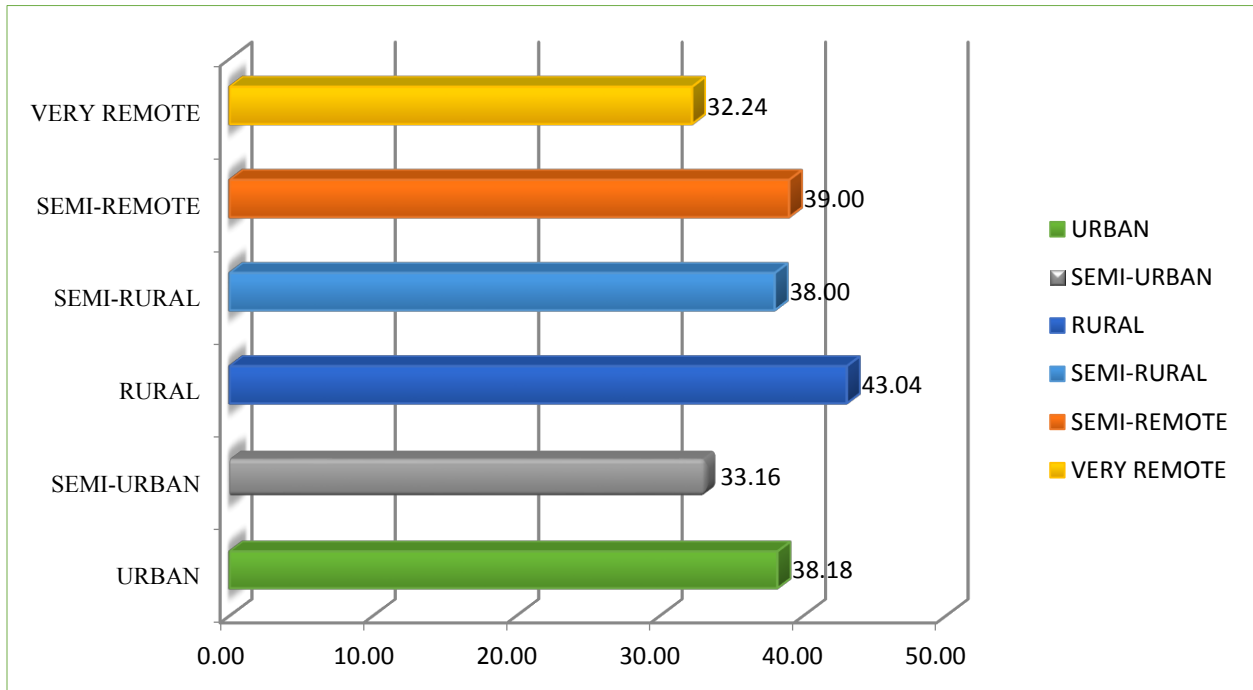

Figure 8:   Achievement in Mathematics by location

The achievement of the students in the schools located in rural settings seemed to have a tendency to perform better than schools located in other settings. The achievement of the student in the remote had performed very poor.
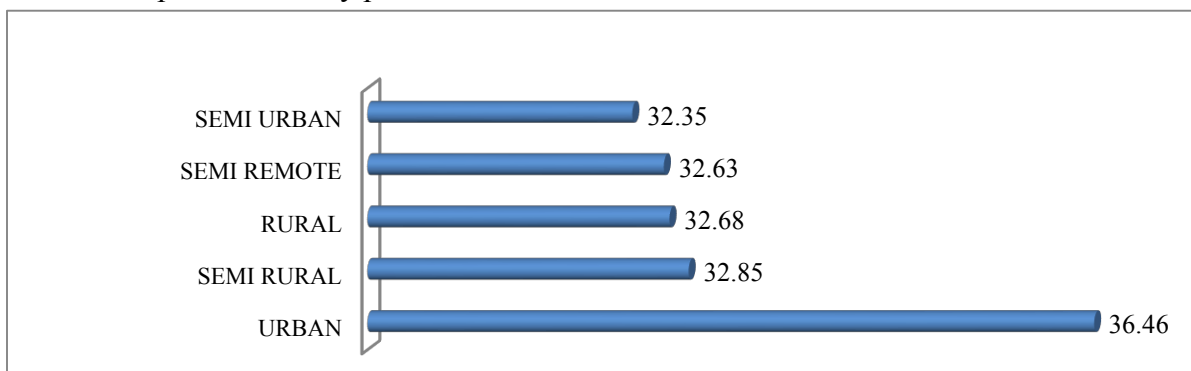
Figure 9:   Performance by school location in English

The achievement of the students in the schools located in urban settings seemed to have a tendency to perform better than schools located in other settings. The English performance of schools located in other than urban areas did not seem to depend on their locations, though semi-urban schools performed a little poorer than schools in any of the other locations. The reason could be

the students in urban setting are exposed with media and other resources. The other factor is that the students in urban setting gets the opportunities to apply and use English language outside their classroom situation.

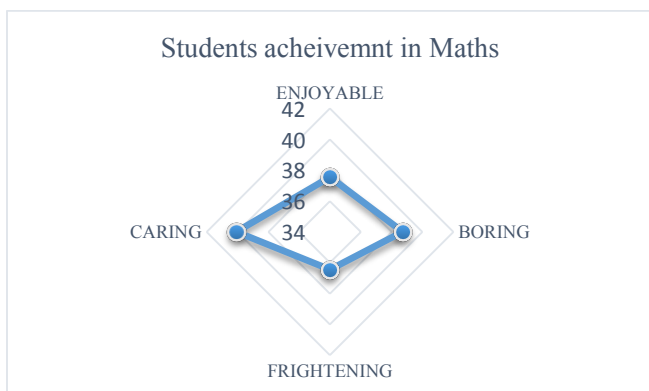### 2.4.4 Finding based on the attitudes and values of the students towards learning

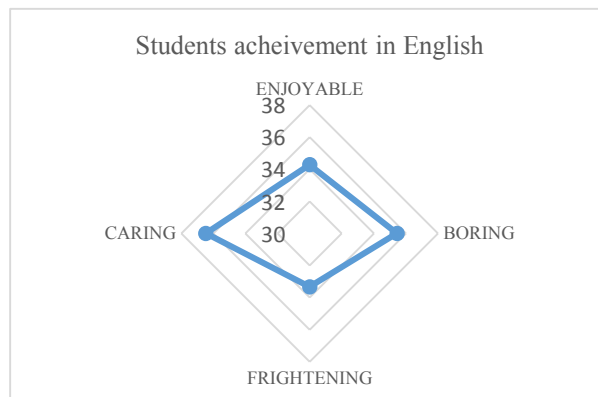Figure 10: Performance by attitude in Maths

Figure 11: Performance by attitude in English

The school learning environment also impacted children's performance in Mathematics and English. The students who felt that their schools were caring to them performed better than those who felt their schools to be frightening. But those who were bored with their schools did slightly better than those who enjoyed being in their schools. However, frightening school environment certainly had a negative consequence in student performance.
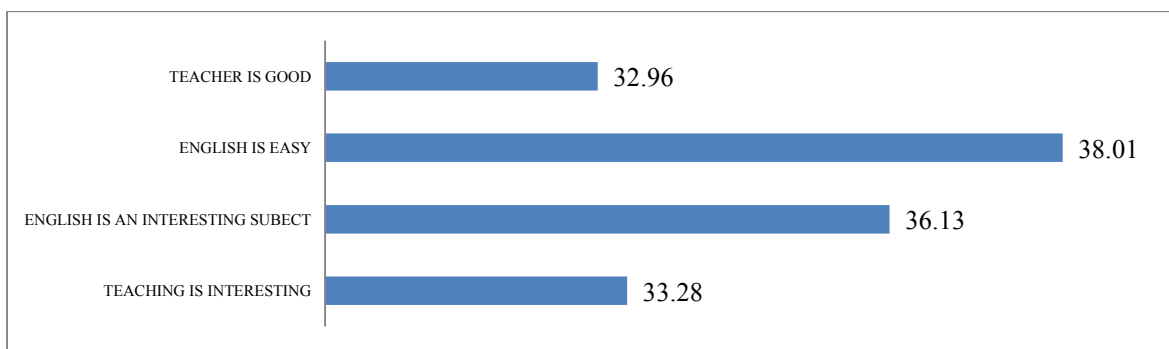
Figure 12:   Performance by liking for English

The students who reported of liking the English subject obviously performed better than those reported of disliking it. Those who liked the subject because it was easy did much better than those who liked it for other reasons. On the disliking of the subject, students did the worst, if they disliked it for its being a difficult subject. However, those who disliked the subject because it was boring seemed to do better than those who disliked it for other reasons.

NO		28.68
YES		41.98

Figure 13: Performance by liking for Mathematics

The students held various views and opinions on learning of Mathematics which accordingly influenced their achievement in it. Those students who liked the subject performed significantly better than those who did not like it. Those who liked the subject, as it was easy or interesting, did better than those who liked it because of the good teachers or because of the interesting teaching.

MOTHER FATHER

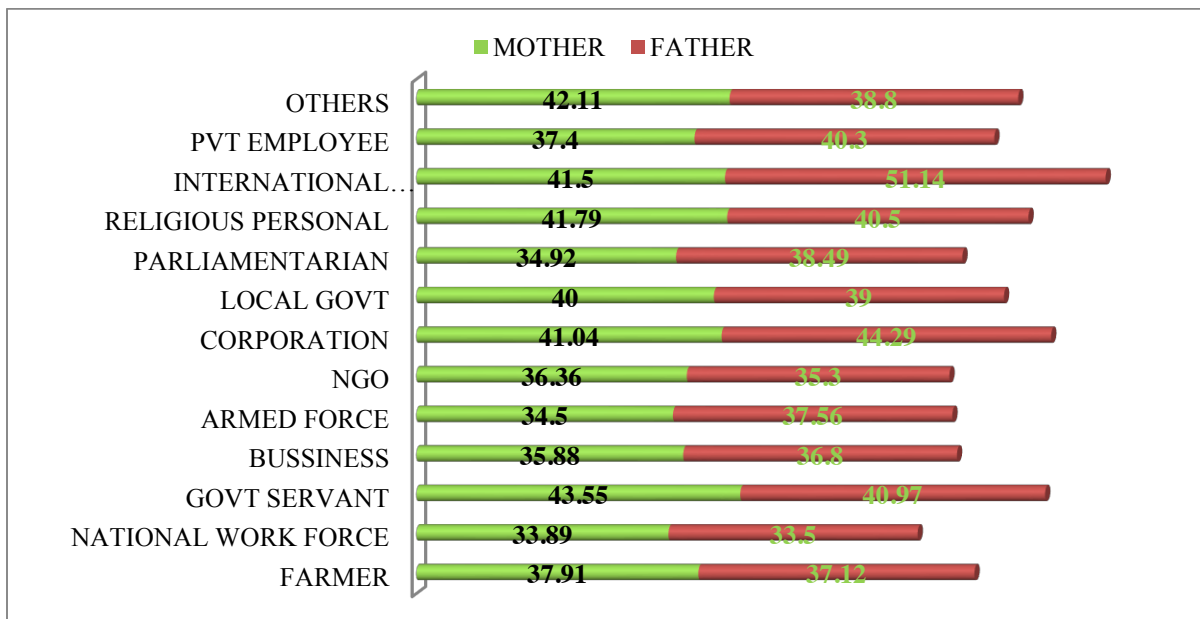|	MOTHER	FATHER
OTHERS	42.11	38.8
PVT EMPLOYEE	37.4	40.3
INTERNATIONAL…	41.5	51.14
RELIGIOUS PERSONAL	41.79	40.5
PARLIAMENTARIAN	34.92	38.49
LOCAL GOVT	40	39
CORPORATION	41.04	44.29
NGO	36.36	35.3
ARMED FORCE	34.5	37.56
BUSSINESS	35.88	36.8
GOVT SERVANT	43.55	40.97
NATIONAL WORK FORCE	33.89	33.5
FARMER	37.91	37.12

Figure14: Performance by socio economic condition of parents in Mathematics

Going by the occupation of parents, students of those parents in the government service, in international organization and corporations seemed to edge over the students whose parents were in other occupations. Farmers' children also did much better than the children of parents working in National Wok Force, armed forces and in business.

On comparing the National Education Assessment performance over the years, it was found out that mean score in English has slightly increased from 32.87 (NEA- 2006) to 34.72 (NEA- 2013). However, there is no significant change in the performance of Mathematics. The mean score was 38.97 in (NEA-2006) and 38.03 in (NEA-2013).

In terms of competency and proficiency level about 50.63 % of students in Mathematics and about 48.03% of students in English achieved minimum competency level. Less than 20 % of them achieved proficiency in Mathematics and very less percent achieved proficiency in English.

Correlation between English score and Maths score

$y = -0.0589x + 40.016$
$R^2 = 0.0011$
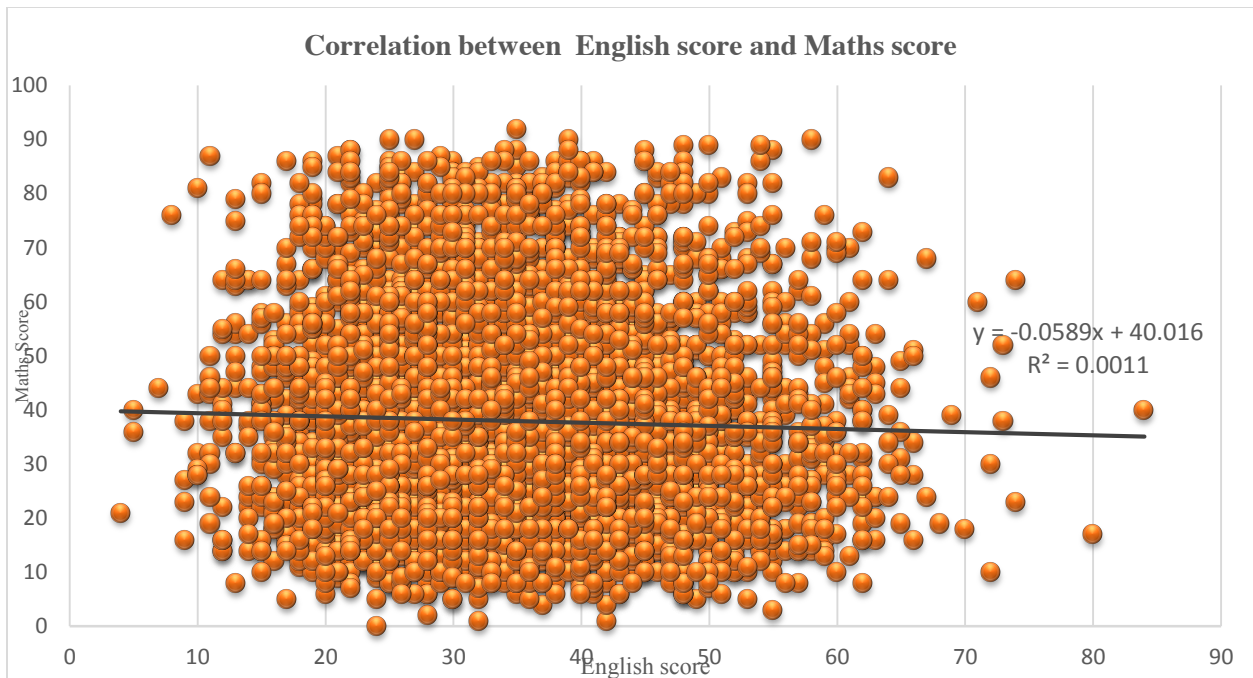
Figure 15: Correlation between English score and Mathematics score

The correlation between English and Mathematics score of 0.033, indicated that there is very weak correlation among the students achievement. The regression equation of the two variables is represented by $y = -0.0589 + 40.016$.

Correlation between Reading and Writing in English

$y = 0.4072x + 4.7706$
$R^2 = 0.2119$

Figure 16: Correlation between reading and writing in English

The correlation between reading and writing achievement of the students ($r = 0.5$) is very strong. The regression equation of two variables is represented $y = 0.4072x + 4.7706$.

2. 5 Methodologies used to analyse data

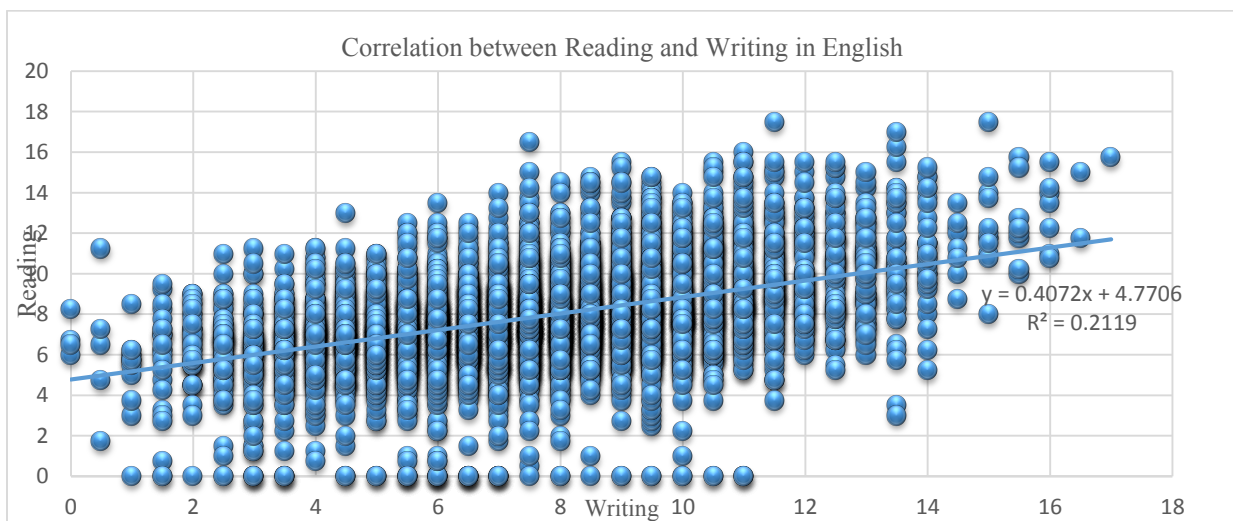The two tests, with 26 items in English and 38 items in Mathematics, were designed to assess student competencies in the two subjects. The test items in both the subjects included the multiple choice questions (MCQ), short response questions (SRQ) and extended response questions (ERQ). They were designed by covering all learning standards of both content and competencies as per the curriculum and followed the mode of assessment prescribed by the (REC) erstwhile Department of Curriculum Research and Development (DCRD). The question items were also spread well over the Bloom's Taxonomy of learning to ensure the balanced inclusion of all levels of thinking. The selection of contents for both the subjects was based on the competencies required to be acquired by the learners at the end of Class X.

To study the impact of other external factors and context of the student performance, students responded to English and Mathematics questionnaire. Those teachers who taught English and Mathematics to the participating students were made to respond to the Teacher Questionnaire designed separately for their respective subjects. Other support tools included teachers and students tracking forms (STF and TTF) and Test Administrators Form (TAF) designed essentially to monitor and track the numbers of students participating in the assessment and to record the situations under which they participated.

Three statistical programs/tools were used to analyse the data: Structure query language (MS Access 2013), Statistical Package for Social Sciences (SPSS) and MS Excel 2013. After evaluation of test papers the scores were directly entered and process in access MS Access 2013. Using SQL, different tables were generated and data were triangulated using relational query. Simple descriptive statistics of the data were generated using SQL. Some data that needed inferential interpretation were then exported to MS Excel which was then processed for further inferential statistics using SPSS. Over all simple regression analysis model and cross-section analysis were adopted to analyse the relation between the different parameters.

The Quest program was used to provide a Rasch analysis for the multiple choice items of the test. Test and item characteristics are important issues in Classical Test Theory (CTT). The main test characteristics according to CTT are the reliability of a test. The reliability of a test and item-test correlation coefficient(r) was carried out using SPSS.

Data extraction was done based on format developed for report writing. This was done in keeping with the factors such as time, validity and proper execution of the data. The reporting was done, following seven major chapters and an executive summary outlining the assessment enquiry questions, major findings and recommendations.

2.6. Other official datasets that are relevant for the analysis purposes

The other important datasets that this report used were from education data processing (EDP), a unit under BCSEA, which gives detail background information of the children. These dataset are then triangulated with the individual student performance which help us to understand the

variations among students' cognitive, affective abilities with regard to literacy and numeracy from socio-economic, regional, and gender dimensions. Relevant official dataset from EMIS, annual education statistics and national statistics bureau are used in this report to do cross-sectional analysis on the children learning outcomes.

3. Findings from the Analysis and Assessment Data that are Used in Practices and Policy Implication

The findings from the analysis of assessment data would allow Bhutan to learn the use of research and educational assessments to address pertinent educational policy issues. The programme would also equip Bhutan with the technical knowledge, skills and experience and build capacity to conduct research and assessment activities. Bhutan is at the juncture where the capacity to conduct high-quality, large-scale educational policy surveys continuously at its priority. The findings is an exercise that helped the system in order to monitor and evaluate the growth and performance of the Bhutanese education system.

The findings from the analysis and data assessment with recommendations are being disseminated to various relevant agencies at different levels. To name few examples where Ministry of Education had taken broad steps as recommended from the findings of NEA are:

a) The formulation of Bhutan Education Blueprint (2014-2024) which proposes rethinking in education and taking radical steps to respond to the challenges and changing needs of our education system holistically.
b) The findings of the NEA showed that children of farmers, national work force and those children staying with friends and relatives performed less well than those children with their parents. Efforts are being made to lessen these circumstantial disparities through the provision of central school in all the dzongkhags with boarding facilities and other support services. This will enhance quality of education as the central schools are provided with adequate resources.
c) The findings of the NEA also indicated that there was an urgent need to enhance teacher competency to improve quality of education. To this end a new division under Royal Education Council is formed to look after the in-service teachers training program. This will help to enhance the teacher's competency in all areas of teaching learning process.

3.1 Forms and methods of dissemination of the results

Many platforms are used to inform the relevant stakeholders and other education community about the results and data availability of an assessment. The different platforms adopted by BCSEA to disseminate data for the target assessment are;

a) The assessment reports are made available online in the form of soft copy in our official website,
b) Copies of the assessment report are distributed to all the different level of schools,
c) The assessment report are presented to the board of directors, BCSEA, for its approval and
d) The assessment results are presented to Ministry of Education and to other stakeholders at the national level.

4. Issues and Challenges

The National Education Assessment (NEA) in Bhutan was carried out since 2003 by different international agencies at different levels and had come up with various findings and recommendations that entail the policy formulation at different level within the Ministry of Education. The BCSEA started conducting NEAs without involving international agencies since 2011.Over the years BCSEA carried out this programme based on the need of the country. Although BCSEA had gained lots experience on how to conduct the program like NEA, it encountered many challenges and issues while implementing the programme as it lacked technical human capacity and the financial resources. The challenges and issues encountered are as listed below:

a) designing assessment task that reflect assessment framework without having proper assessment framework in place was a major challenge at the moment the assessment tasks are developed based on the curriculum framework,

b) getting the correct sample population that represent population without any scientific method and deriving weighted and un-weighted participation rate,

c) developing and designing valid and reliable background questionnaires with proper scale,

d) test administration with limited resources,

e) validating assessment tasks using new updated quantitative and qualitative methods, including trial testing and expert review on the task,

f) analyzing data and making inferences out of the data,

g) triangulating findings from background questionnaires with the result of assessment,

h) creating a calibrated scale for each domain of learning and mapping children along the developmental continuum was a major challenge,

i) evaluating of result in terms of proficiency descriptions and in terms of the skills, knowledge and understanding demonstrated by children in the assessment task,

j) accommodating children with special needs in the large scale assessment,

k) not able to do proper data appraisal to the fullest manner using software,

l) report writing and data dissemination to different stakeholders at the large and to the media,

m) not able to design a long-term monitoring program on the growth of achievement in cohorts throughout the school cycle, from one level to another level,

n) generating valid recommendations for policy formulation and proper usage of assessment data in designing new programme,

o) assessment data are not regularly translated into implementation into policy and planning enhancement by the policy makers, education leaders, research institutions and other civil society,

p) not able to produce and disseminate assessment results of students at the school level,

q) harmonizing and synchronization data from different range of stakeholders,

r) not able to include Progress in International Reading Literacy Study (PIRL) and Trends in Mathematic Study (TIMSS) items in order to produce international comparisons/ benchmarking and

s) no committed budget as a result it is very difficult to involve international assessment partners.

5. Recommendation and Way Forward

The findings such as the ones mentioned above have implications on all policy, resource allocation, curriculum development and teacher training, school locations and classroom teaching. Students are the centre of all plans and policy, resources allocation and efforts of school education programmes with the ultimate aim of improving their learning outcomes. Findings from this assessment indicate a numerous issues that impact student performance.

The following are the list of recommendations for improving the standards of the student assessments and for the better utilization of the assessment results and policy planning purposes. The recommendations are divided into two parts. The first part of the recommendation is targeted towards the improvement of learning achievement of students. They are listed as follows:

a) further reduce the class size,
b) further reduce walking distances between children's homes and schools particularly in the remote and difficult areas,
c) consider allocating more resources for schools in rural areas and remote schools,
d) reduce the gender gap in Mathematics, programs and manual could be reviewed to include more girl-friendly content, and maths teaching to girls be emphasized,
e) include gender issues by modifying teachers' representation and persistent stereotype of girls being less talented in Mathematics.
f) schools should pay equal attention and provide equitable support to both girls and boys in their learning,
g) provide professional and timely support to the schools and teachers from the responsible agencies through frequent in-service workshops on content knowledge validation, teaching skills, effective assessment practices and use of ICT in teaching learning process ,
h) make school's physical and social ambience more conducive in order to make students learn comfortably and perform better,
i) emphasis on moral literacy along with the academic literacy excellence of the students in the schools,
j) school should pay equal attentions and provide equitable support to both girls and boys in their learning and
k) give students enough reading and writing practice on unseen text and consciously grammar ptactice.

The second part of the recommendations is focused towards improving assessment and how it could be best utilize into policy planning. They are listed as follows:

a. BCSEA to develop national assessment policies, analytical framework and monitoring framework involving the international assessment agencies,
b. prioritise the area need study and make it relevant to policy makers,
c. improve the quality and the validity of test items and the background questionnaires,
d. incorporate ways to accommodate the participation of the students with special needs and out of school children,
e. include Progress in International Reading Literacy Study (PIRL) and Trends in Mathematic Study (TIMSS) items in order to produce international comparisons/ benchmarking,

f. use technical tools to get the sample population at the school level so that it gives more valid data study and also inform the schools well in advance so that the students are mentally prepared,
g. orient test administrators well before the conduct of NEA test so that they can brief the students well so that the student can write the test with some degree of seriousness.
h. develop the human capacity of BCSEA on uses of analysis software and designing the valid instruments,
i. disseminate the test results of the students at the school level as well at the individual level through different forum and
j. involve the policy makers and bureaucrats in formulating the recommendations from the findings.

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