

Chapter Three

General Patterns in Performance of Students

3.1 Introduction

General patterns in performance of Grade 08 students at national level has been identified using order of location of frequency distribution curves (frequency polygon), the nature of frequency polygons in the three subjects, the skewness values of the frequency polygons at national level, average performance levels evident in the national mean values, percentage of students below and above the national mean values, frequency distribution of scores of the three subjects and, the percentage of students indicated by percentile.

3.2 Patterns Evident at National Level

3.2.1 Order of the Location of Frequency Distribution Curves (Frequency Polygons) at National Level

The overall picture in the distribution curves of Grade 8 students in the three subjects First Language, Science and Technology and Mathematics are given in Figure 3.1 (2005 study) and Figure 3.2 (2008 study).

In year 2005 the position of the three frequency polygon given in Figure 3.1 show that the performance of Grade 08 students in First Language is high. According to the distribution curve Science and Technology shows an average performance. Performance of Mathematics is low. The same pattern

Frequency Polygon

A line graph joining the number of individuals who obtain each score, or who occur within a given score interval.

- David Satterly

is seen in the three frequency polygons (distribution curves) given in figure 3.2. This is not a comparison of the three subjects. However, it reveals the status of performance in the three subjects. When the two Figures 3.1 and 3.2 are compared, what emerges is that the same patterns of high performance in First Language, average performance in Science and Technology and low performance in

Mathematics is seen in both years. In other words, the order of the performance level of the Grade 08 students has remained same in 2008, as in 2005.

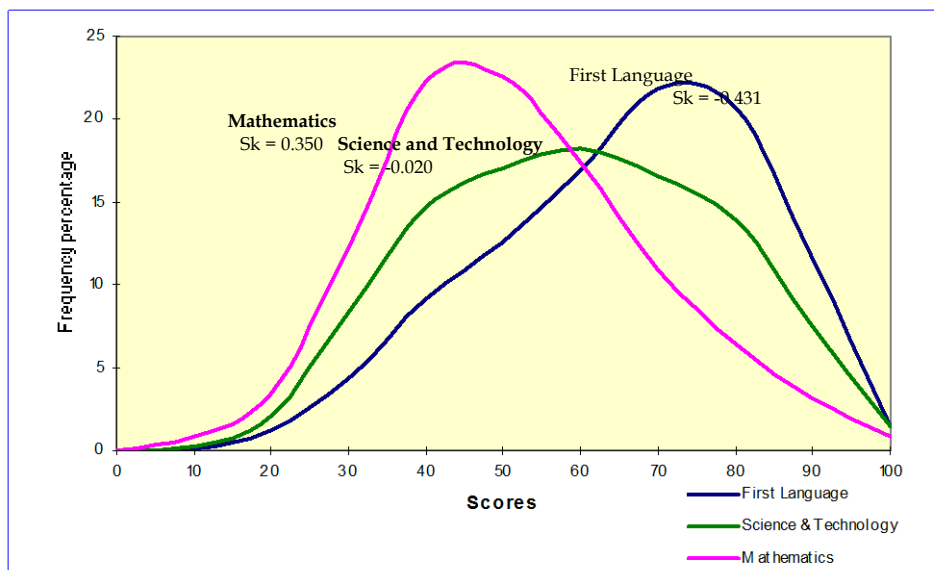


Figure 3.1: All Island Frequency Polygons (Distribution Curves)- First Language, Science and Technology and Mathematic, Grade 08 - 2005 Study

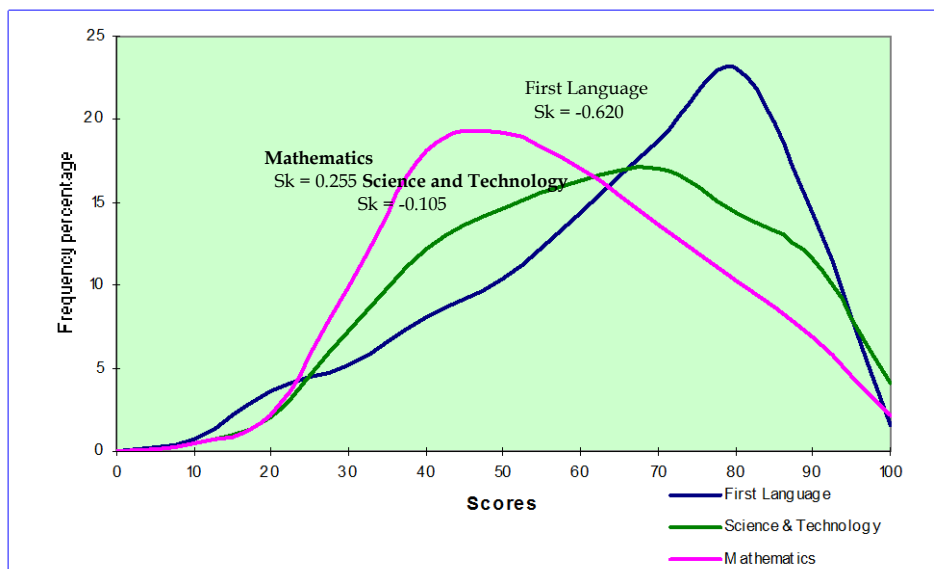


Figure 3.2: All Island Frequency Polygons (Distribution Curves) - First Language, Science and Technology and Mathematics, Grade 08 - 2008 Study

3.2.2 Nature of the Frequency Polygons at National Level

The nature of the frequency polygons reveals the patterns in relation to the achievement of students. One is that these curves indicate whether it has shifted to the right or left. If it has shifted to the right those achievement levels have gone up.

A shift of the curve to the left indicates that achievement levels have come down, after three years. The curves floated in dotted lines represent the frequency polygons, in 2005. When compared, the shift of the curves to the right or left can be noted.

3.2.2.1 Nature of the Frequency Polygons in First Language

The nature of the frequency polygons for the two years 2005 and 2008 may be gauged looking at Figure 3.3. The dotted line indicates the 2005 frequency distribution curve, the continuous line, the 2008 distribution curve. The unimodal nature of the distribution curve can be noted, in both years. In year 2005, a large number of scores were piled around a class interval 60-69. In year 2008 the highest number of scores are within class interval of 70- 79, indicating a better performance level in year 2008 compared to year 2005.

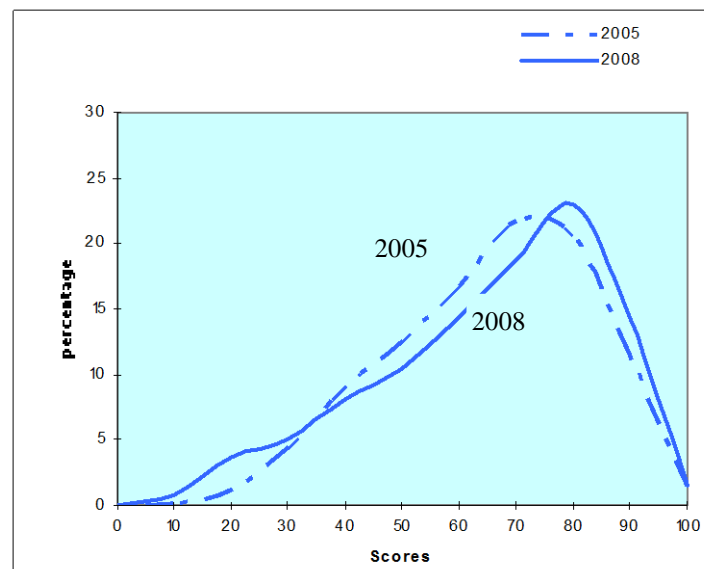


Figure 3.3: All Island Frequency Polygons (Distribution Curves)- First Language, 2005 and 2008

When the two curves are compared a shift of the frequency polygon to the right can be seen, in 2008. This kind of shift indicates that the percentage of scoring higher marks has increased in 2008, in comparison with 2005. However, according to the frequency polygon in year 2008, the percentage of students in the three lower class intervals ranging from 0 to 39 have increased, showing a higher percentage of low performance students in year 2008 in comparison with year 2005.

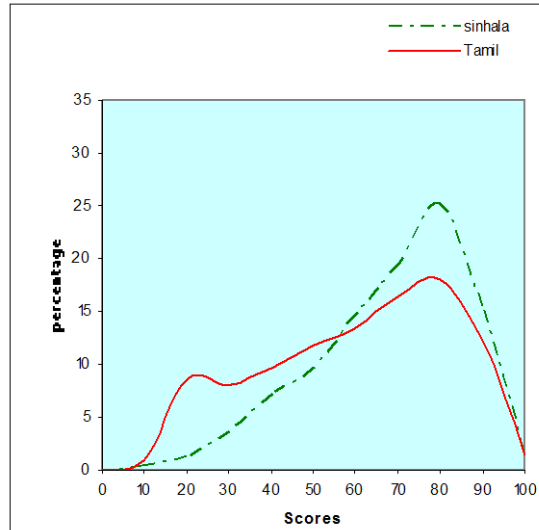


Figure 3.3.1: All Island Frequency Polygons (Distribution Curves)- First Language (Sinhala and Tamil), 2005 and 2008

The nature of the frequency polygons of First Languages Sinhala and Tamil can be understood from the Figure 3.3.1. Skewness of frequency polygon of Sinhala Language was more towards right and the Tamil Language is bimodal. Students scoring marks between 10-30 was 17.4% and it is represented by the first mode. Students scoring marks between 10-30 at national level is very low.

3.2.2.2 Nature of the Frequency Polygons in Science and Technology

The frequency polygon in Science and Technology has shifted to the right showing a better performance level in 2008 in comparison with 2005. (See Figure 3.4.)

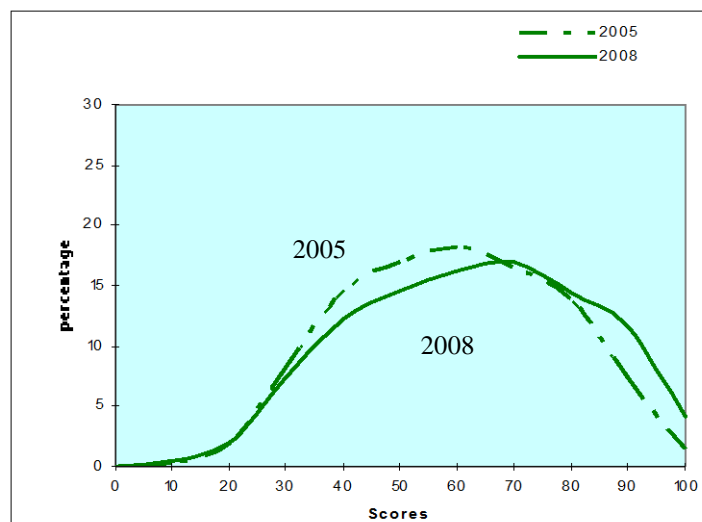


Figure 3.4: All Island Frequency Polygons - Science and Technology, 2005 and 2008

There is no improvement in the percentage of students falling within the first three class intervals ranging from 0 to 29. The frequency distribution curves in both years show mesokurtic nature, a small difference with a higher percentage of scores falling within the highest class interval than the lowest class interval. In other words the percentage of students scoring lower marks are less, and the percentage of students scoring higher marks are more than the percentage scoring lower marks. This status of the Frequency polygons represents a better performance level and an improvement in the national achievement level.

3.2.2.3 Nature of the Frequency Polygons in Mathematics

The frequency polygons in Mathematics for both years 2005 and 2008 are unimodal. (See Figure 3.5)

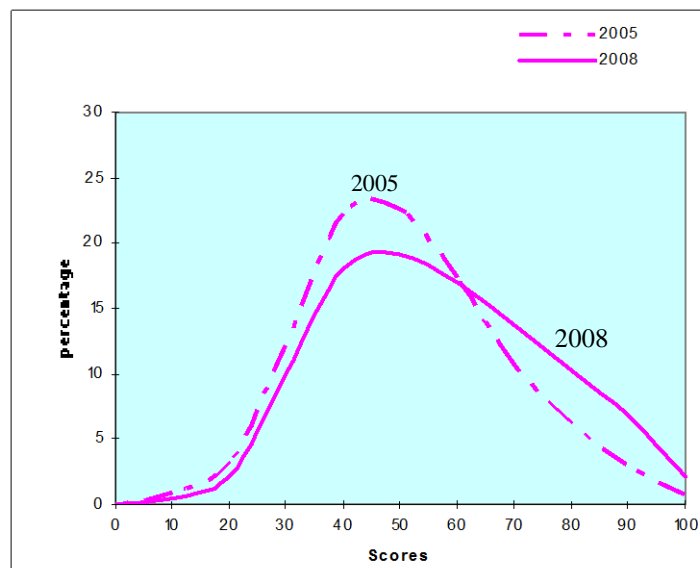


Figure 3.5: All Island Frequency Polygons (Distribution Curves) in Mathematics, 2005 and 2008

In both years the larger percentage of scores have fallen within the class interval of 40 to 69. According to the frequency distribution curve, the percentage of students scoring lower marks have come down and the percentage of students scoring higher marks have gone up. Frequency polygon in 2008 indicates a more negatively skewed distribution. Statistically, the conclusion is that there is a large improvement in performance levels of students in Mathematics at national level, in

year 2008. Frequency polygons indicate that this improvement is slightly larger than that of the other two subjects.

3.2.3 The Skewness Values of the Frequency Polygons at National Level

The skewness values of the distribution curves confirm the pattern of performance which has been highlighted using the order of the distribution curves. In addition, these values identify another pattern of performance. Figures given in Table 3.1 highlight the nature of the skewness of distribution of curves, of the three subjects for the two years 2005 and 2008.

Skewness
 ...refers to the trailing off of scores towards extremes in one direction, away from the bulk of cases..... a skewness value of +1 shows rather extreme positive skewness.....a value of -1 shows rather negative skewness.
 - Gilbert Sax

Table 3.1 - The Nature of the Skewness of the Distribution Curves (2005 and 2008)

Subject	2005	2008
First Language	-0.431	-0.620
Science and Technology	-0.020	-0.105
Mathematics	0.350	0.255

In relation to First Language for both years 2005 and 2008, the skewness values give minus figures, confirming that in both years, the scores are trailing off towards the higher end; it means that the percentage of students scoring high marks in First Language is high, in both years. In addition, in year 2008 skewness value is higher than in 2005. This identifies another pattern; that is, the performance level of Grade 8 students in 2008 is better than that of the 2005 students.

Skewed Distribution
 A distribution of scores which departs from symmetry or balance around the mean. A distribution for which the average of the z-scores (q.v.) raised to the third power (i.e. z^3/n) is negative is said to have 'negative skew', one in which z^3/n is positive has 'positive skew'.
 - David Satterly

The same patterns of performance can be seen in the two other subjects, Science and Technology and Mathematics, in both years 2005 and 2008.

The skewness values are minus, showing a trailing off of scores towards the higher end. As seen in First language, performance of students in Grade 08 Science and Technology has moved upwards. In Mathematics, the skewness values of both years are positive. However, the 0.350 value that was noted in 2005, has come down to 0.255 in 2008; this means that although there is a trailing off of scores towards the lower end, the performance level of the students in Mathematics has gone up, during the year 2008.

3.2.4 Average Performance Levels in National Mean Values

The mean value or the arithmetic mean of a set of schools is obtained by calculating the average value of the set of scores; this is one of the most popular indicators used to gauge the average performance levels of students. This measure of central tendency allows comparison between subjects as well as between years. This indicator identifies the position of students in the group; whether the position of the students is above the mean, equal to the mean or below the mean.

Mean Values

Mean is the value obtained when the sum of the set of scores is divided of the number of scores. Mathematically it is that value about which the sum of the deviation (q.v.) is zero.

-David Satterly

A measure of central tendency or of the average numerical value of a set of scores.

**-D.S. Frith and H.ZG.
Macintosh**

It gives the readers an opportunity to understand whether the child is above the average performance level or equal to the average level; or below the average level. In using this mean value, the total score (which is 100 in this set of scores) and the standard deviation of the set of scores as well as the standard error of to the mean values can be useful in interpreting data. (See Table 3.2.)

The mean values of the three subjects indicating the average performance levels of the students in years 2005 and 2008 (along with the standard deviation and standard error) are given in Table 3.2.

Table 3.2 - Relative Difference in Mean Values (2005 and 2008)

Subject	Mean Value		Standard Deviation		Standard Error		Difference in mean values
	2005	2008	2005	2008	2005	2008	
First Language	59.89	59.87	17.6	19.8	0.0340	0.196	-0.02
Science and Technology	53.19	56.32	18.6	19.9	0.0356	0.1989	3.13
Mathematics	45.19	50.45	17.1	18.9	0.0330	0.189	5.26

The values given in Table 3.2 as well as in Figure 3.6 clearly highlight the changes in performance levels of Grade 08 students during the last three years. The largest improvement is seen in Mathematics. The mean value of 2005 was around 45; it has gone up to a value of 50 in 2008. The difference in the given value is more than 5.2. Among the three subjects, this shows the largest difference; i.e. the largest improvement in achievement levels of students is shown in Mathematics.

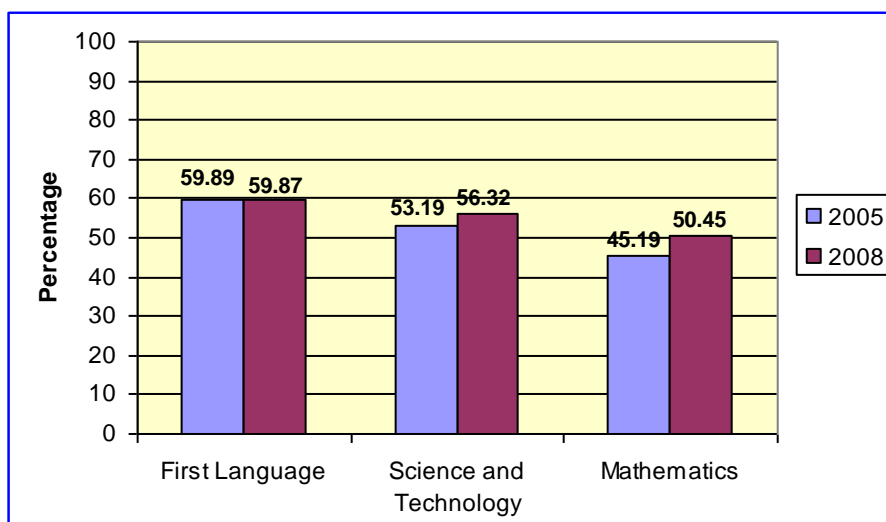


Figure 3.6: Mean Values in the Three Subjects First Language, Science and Technology and Mathematics (2005 and 2008)

In Science and Technology the difference in mean value is 3.13; the 2005 mean value of 53.19 has gone up to 56.32, in year 2008. This improvement in Science and Technology is evident when the frequency polygons and skewness values of the

distribution curves were analyzed earlier in this chapter, highlighting this improvement. The mean values in First Language do not represent a change in the performance levels of the students. The difference between the two years 2005 and 2008 is only -0.02. Though there was a shift to the right in the frequency distribution curve and, a larger negative skeweness value in year 2008 showing a higher percentage of students falling in the higher class intervals of scores, the average performance level between the two years have not changed. Though there is a minus value of -0.02 it means that a change in average performance of students at national level has not taken place.

3.2.5 Percentage of Students Above and Below National Mean Values

The percentage of students above and below mean values indicate how the scores are distributed above and below the average levels. The values given in Table 3.3 and Figures 3.7 and 3.8 show that a larger number of students are above the mean value. The percentage below the mean value is 44 and the percentage above the mean value is 56, in both years. It can be concluded that more students have scored higher marks in year 2008 than in 2005; this is to be considered along with the improvement in the mean value of Mathematics, in year 2008.

Table 3.3 - Percentage of Students Above and Below the National Mean Value in First Language, Science and Technology and Mathematics (2005 and 2008)

Subject	Above Mean Value		Below Mean Value	
	2005	2008	2005	2008
First Language	55.60	56.70	44.40	43.30
Science and Technology	48.70	50.0	51.30	50.00
Mathematics	44.00	44.00	56.00	56.00

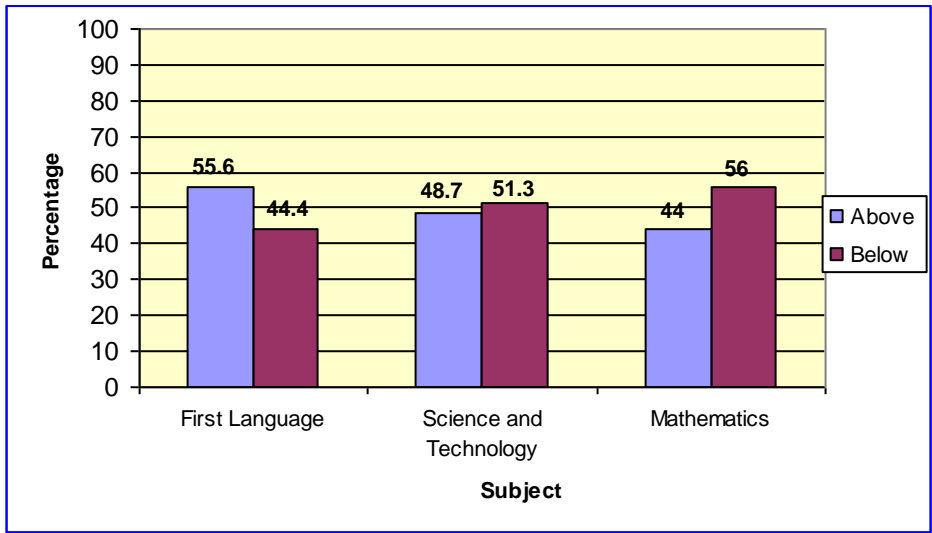


Figure 3.7: Percentage of Students Above and Below Mean Values in the Three Subjects -2005

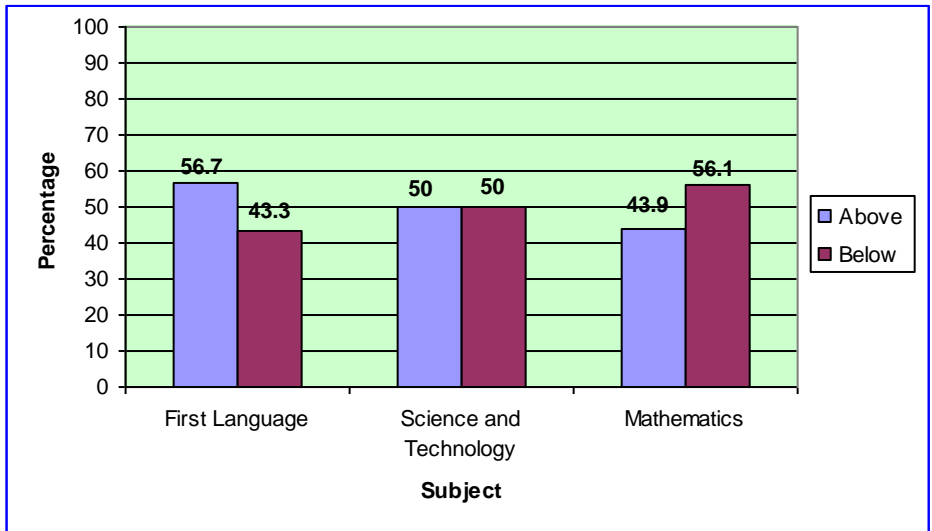


Figure 3.8: Percentage of Students Above and Below Mean Values in the Three Subjects - 2008

In Science and Technology the percentage above the mean value has clearly gone up, from 48.7 up to 50.0. When taken together with the national mean value, this improvement highlights the fact that more students have scored higher marks in 2008 than in 2005, in the subject Science and Technology (See Table 3.3). However, in First Language there is no relative difference in the all island mean values in the two years, however there is an improvement of students falling within the class interval above the mean value. As was highlighted using the nature of the

frequency distribution curves, it can be concluded that there is an increase in the performance levels of students in First Language, shown by the higher scores achieved in year 2008.

3.2.6 Frequency Distribution of the Scores of the Three Subjects, in the Two Years 2005 and 2008

The tables which give grouped data using the tables of frequency distributions of scores and shown in the form of histogram, makes it clear how and why the performance levels of students in the two years, have changed. Table 3.4 and Figures 3.9 and 3.10 give necessary information on the First Language.

Table 3.4 - Frequency Distribution of Scores- First Language, 2005 and 2008

Class Interval	Frequency Percentage		Difference in Frequency Percentage
	2005	2008	
90-100	1.5	1.6	+0.1
80-89	11.6	14.4	+2.8
70-79	20.7	23	+2.3
60-69	21.8	18.7	-3.1
50-59	16.9	14.4	-2.5
40-49	12.6	10.4	-2.2
30-39	9.2	8.1	-1.1
20-29	4.4	5.1	+0.7
10-19	1.2	3.6	+2.4
0-9	0.1	0.7	+0.6

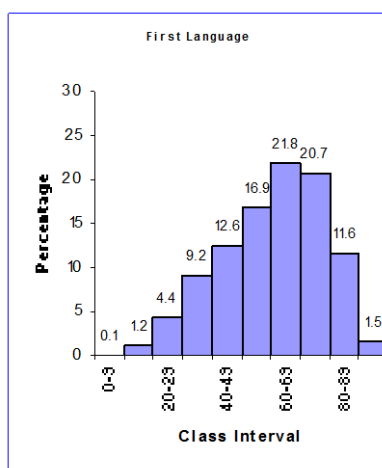


Figure 3.9: All Island Distribution of Scores in First Language: Histogram , 2005

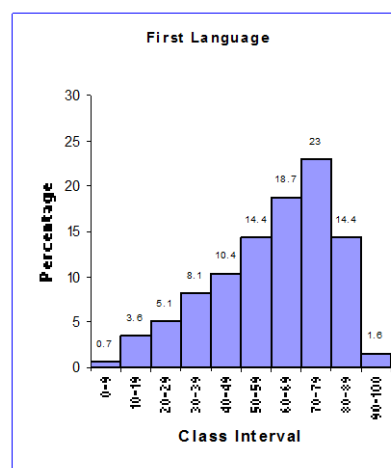


Figure 3.10: All Island Distribution of Scores in First Language, Histogram, 2008

In year 2008 scores of students which have fallen within the class interval ranging from 70-100 have increased. The data available in Table 3.4 confirms that this increase is ranging from +0.1 up to +2.8. When the histograms are given in Figures 3.9 and 3.10 are compared it is quite clear how the percentage of scores which has fallen in the class interval of 70 to 79 has gone up in 2008 up to 23 percent showing a better performance levels of students and in addition this confirmed by fact that 11.6 the percentage of students who are fallen in to the category of 80-89 in First Language has gone up to a percentage of 14.4 in year 2008.

Table 3.4.1 - Frequency Distribution of Scores- First Language (Sinhala & Tamil)

Class Interval	Frequency Percentage	
	Sinhala	Tamil
90-100	1.7	1.4
80-89	15.5	12.1
70-79	25.3	18
60-69	19.7	16.4
50-59	14.9	13.4
40-49	9.8	11.7
30-39	7.3	9.7
20-29	3.8	8
10-19	1.4	8.5
0-9	0.6	0.9

Students scoring below 50 marks in Sinhala Language and Tamil Language were 19.9 percentage and 38.8 percentage respectively and a vast differences could be noticed in other class intervals from 60 - 100 between Sinhala Language and Tamil Language. It implies that the performance of students in Sinhala Language is better than that of Tamil Language.

In Science and Technology the frequency distribution of scores and the histograms given in Table 3.5 and Figures 3.11 and 3.12 give a clear picture about how the frequency percentage of the group data have moved upwards showing better performance levels.

Table 3.5 - Frequency Distribution of Scores- Science and Technology (2005 and 2008)

Class Interval	Frequency Percentage		Difference in Frequency Percentage
	2005	2008	
90-100	1.5	4.1	+2.6
80-89	7.5	11.6	+4.1
70-79	13.9	14.4	+0.5
60-69	16.6	17.0	+0.4
50-59	18.2	12.2	-1.9
40-49	17	14.6	-2.4
30-39	14.7	12.2	-2.5
20-29	8.3	7.3	-1
10-19	2	2	+0
0-9	0.3	0.5	+0.2

The percentage values in the class interval ranging from 60 to 100 have moved upward; an improvement level of 4.1% and 2.6% noted in the two highest class intervals. Figures 3.11 and 3.12 graphically show how the pillars in Figure 3.12 look more taller at the higher end, when compared to the pillars, in 2005.

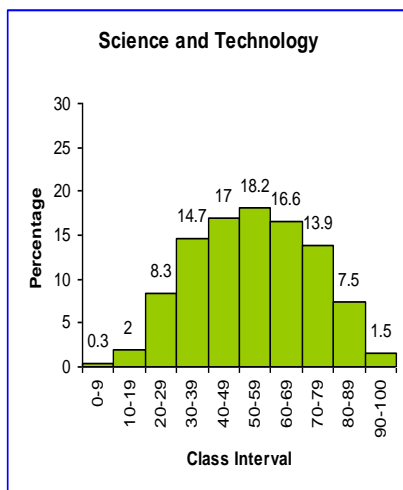


Figure 3.11: All Island Distribution of Scores in Science and Technology – Histogram, 2005

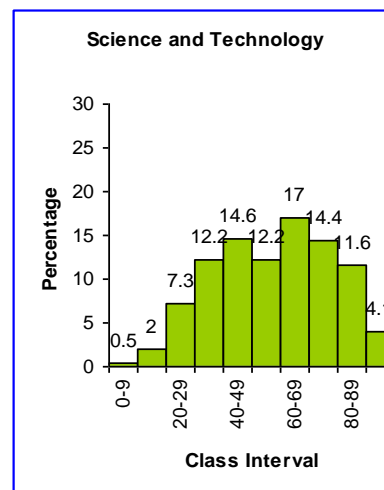


Figure 3.12: All Island Distribution of Scores in Science and Technology – Histogram, 2008

The percentage in the class interval 90 to 100 has gone up from 1.5 to 4.1, in 2008. The percentage in the class interval 80 to 89 has gone up from 7.5 to 11.6 in year 2008. This pattern of upward movement in learning achievement can be seen in the next two percentage values as well. This evidence confirms that the percentage of students scoring high marks or, in other words the percentage of students falling

within higher class intervals have increased, in year 2008. This pattern confirms the nature of performance of the students in year 2008, indicating a better achievement level 2008 than in the year 2005.

Table 3.6 - Frequency Distribution of Scores- Mathematics (2005 and 2008)

Class Interval	Frequency Percentage		Difference in Frequency Percentage
	2005	2008	
90-100	0.8	2.1	+1.3
80-89	3.1	6.9	+3.8
70-79	6.4	10.3	+3.9
60-69	10.9	13.7	+2.8
50-59	17.4	17	-0.4
40-49	22.6	19.2	-3.4
30-39	22.3	18.1	-4.2
20-29	12.2	9.9	-2.3
10-19	3.4	2.2	+1.2
0-9	0.9	0.5	-0.4

Table 3.6 and the Figures 3.13 and 3.14 give the necessary information on the distribution of scores and the difference in the frequency percentages in the years 2005 and 2008, in the subject Mathematics. The larger improvements in the performance levels in Mathematics can be seen when the frequency percentages are analyzed. As shown in Figure 3.13 frequency percentage values in all four class intervals ranging from 60 to 100 have moved upward. The percentage of upward movement ranges from 1.3 to 3.9, which shows a very high level of improvement in achievement.

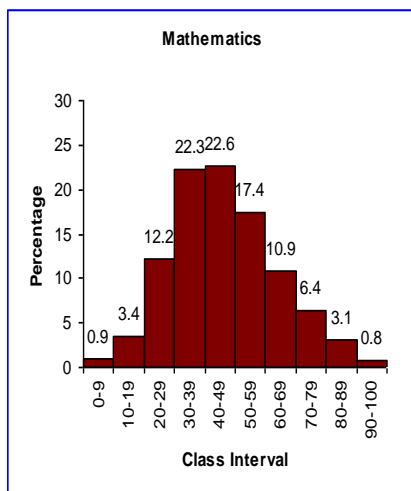


Figure 3.13: All Island Distribution of Scores in Mathematics, Histogram: 2005

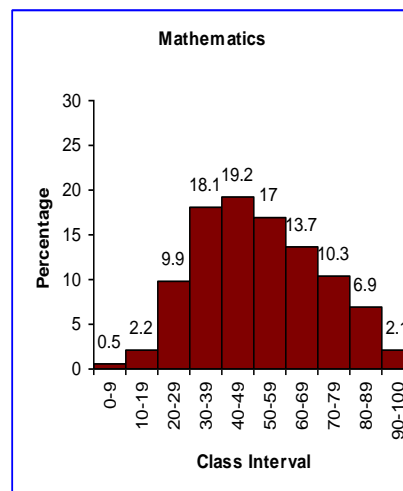


Figure 3.14: All Island Distribution of Scores in Mathematics, Histogram: 2008

At the same time it is noted that the values falling within the class interval ranging from 50 to 59 have come down in the year 2008, than in 2005. The percentage of students showing average performance has come down and the percentage of students scoring higher, has gone up. The conclusion therefore of the nature of the frequency polygon and the skewness values of the frequency polygons is confirmed, by the nature of the frequency distribution of scores recorded in the relevant table and figures.

3.2.7 Percentage of Students Indicated by Percentiles

Table 3.7 and Figures 3.15 and 3.16 give the relevant information on two main points; one is the minimum and maximum marks obtained in the subjects. The other is the 25th, 50th and 75th percentile values in the distribution of subjects, in the scores. This information supports in analyzing some of the patterns in performance; those obtaining high marks and lower marks and the percentage of students who are below a given score. According to the values indicated in Table 3.7 the minimum mark for year 2005 and 2008,

except in First Language, is '0'. Maximum marks for the three subjects in both years are 100. This means that there have been students ranging from the lowest level of achievement to the highest level of achievement, in both years. These test papers were prepared for Grade 08 students based on the Grade 08 syllabus they have followed, were administered after three months of completion of Grade 08 and when the students were in the Grade 09 classes.

Percentile

A method of showing the percentage of the pupils who have scored lower than a given score.

- **D.S. Frith and H.G. Macintosh**

The deviation of a ranked distribution of scores into 99 groups, each composed of the same percentage of scores. Thus the 40th percentile is the score which separate the top 60% from the bottom 40% of scores.

- **David Satterly**

Table 3.7 - Percentile Values of First Language, Science and Technology and Mathematics (2005 and 2008)

	First Language		Science and Technology		Mathematics	
	2005	2008	2005	2008	2005	2008
Minimum Mark	6	0	0	0	0	0
Maximum Mark	100	100	100	100	100	100
25 th Percentile	48	46	37.5	40	32.5	35
50 th Percentile	62	63	52.5	57.5	42.5	47.5
75 th Percentile	74	75	67.5	72.5	55	62.5
Mean	59.89	59.87	53.19	56.32	45.19	50.45

There are a large percentage of students scoring lower marks in the subject tested. This highlights the problem of readiness or, the entry behavior level of students in Grade 08, in order to work successfully in Grade 09. This situation can be analyzed in depth, using percentile values. (See Table 3.7 and Figures 3.15 and 3.16)

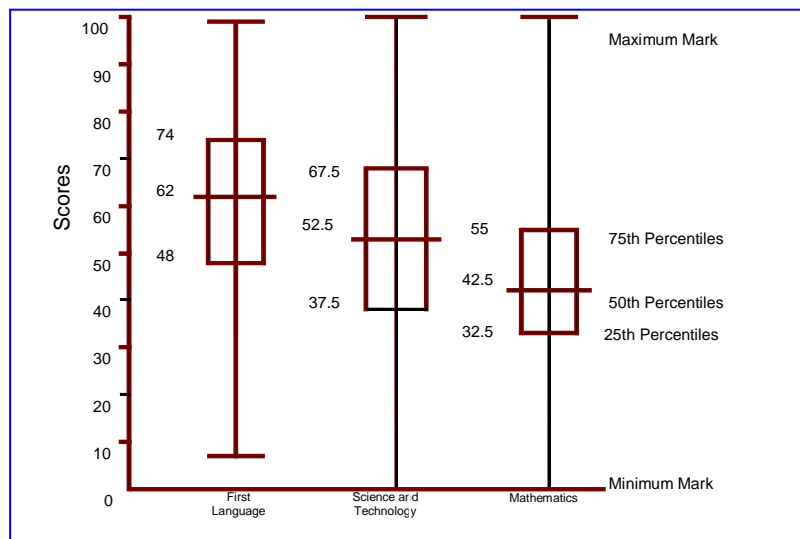


Figure 3.15: Percentiles of Scores in the Three Subjects -2005

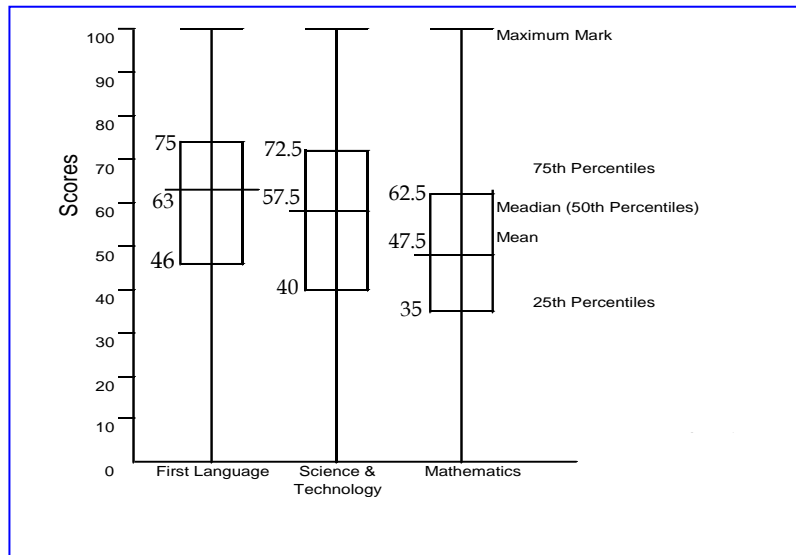


Figure 3.16: Percentiles of scores in the three subjects -2008

In First Language, 25% of the students have scored 48 and 46 marks or below, in years 2005 and 2008, respectively. In Science and Technology the percentage was on or below 37.5 and 40 marks. When the performance of the two subjects are compared the better performance is in First Language. In Mathematics, 25% of the students have scored in the range of 32.5 marks to 35 marks or below, in the two years 2005 and 2008, respectively. This shows that the performance levels in Mathematics are lower than in the other two subjects. Yet the improvement in percentage from 32.5 up to 35 is note worthy. However, the percentage of students who are ready to learn Mathematics in Grade 09 is not large, relative to the groups with readiness for learning First Language and Science and Technology in Grade 09. The increase in the 75th percentile, from 67.5 up to 72.5 in Science and Technology and from the scores 55 up to 62.5 in Mathematics shows how the achievement level of students have moved up, in the year 2008. This pattern of performance can be seen in Science and Technology and Mathematics, in a comparison of Figure 3.15 and 3.16.

3.3 General Patterns in Performance at Provincial level

The general patterns in performance of students at provincial level are discussed separately, so that education planners and implementers will have a total picture of the status at provincial level. When and where necessary, provincial level comparisons are made, making way for the planners to identify provinces to be given prioritized, in their future development activities.

3.3.1 Order of the Location of Frequency Distribution Curves (Frequency Polygons) at Provincial Level

The overall picture of the distribution curves of Grade 08 students at national level, in the three subjects First Language, Science and Technology and Mathematics, was discussed under 3.2.1. Accordingly the performance of Grade 08 students in First Language is high. Science and Technology shows an average performance. Performance of Mathematics is low. This pattern is common to both years. Drawing attention to the location of frequency distribution at provincial level, it can be noted the provinces that maintained the same pattern and, which of the provinces deviated from the pattern. (See Figures 3.17 - 3.34)

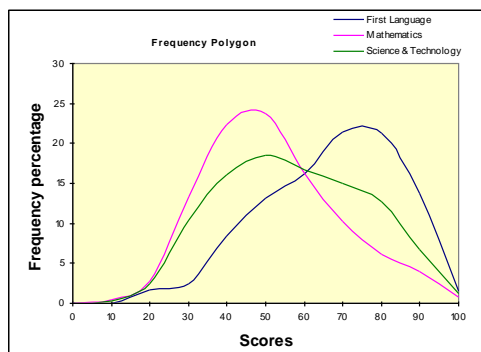


Figure 3.17: Western Province Frequency Polygons : First Language, Science and Technology and Mathematics–2005 study

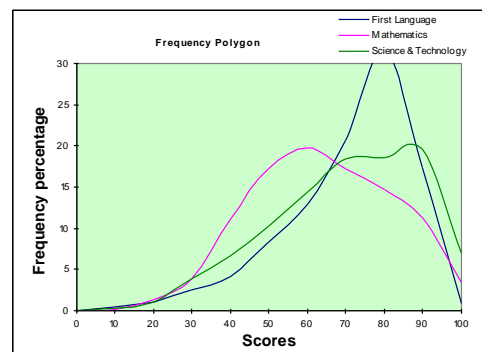


Figure 3.18: Western Province Frequency Polygons : First Language, Science and Technology and Mathematics– 2008 study

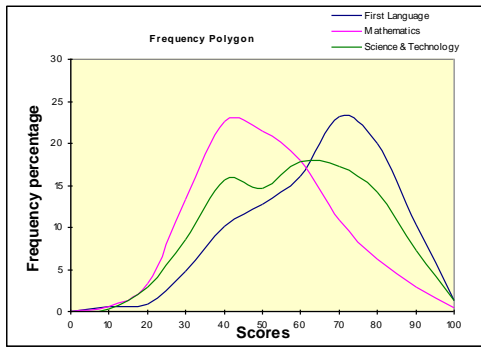


Figure 3.19: Central Province Frequency Polygons : First Language, Science and Technology and Mathematics–2005 study

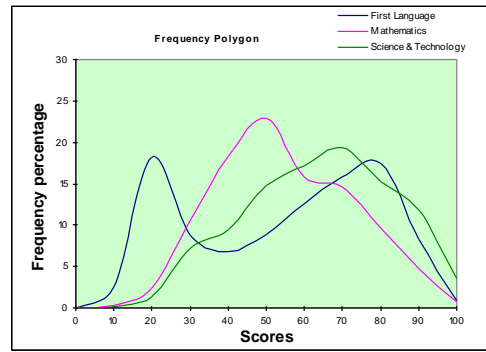


Figure 3.20: Central Province Frequency Polygons : First Language, Science and Technology and Mathematics–2008 study

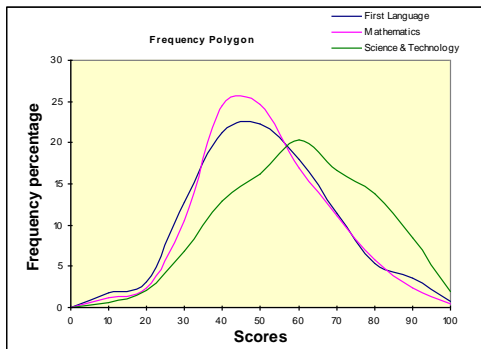


Figure 3.21: Southern Province Frequency Polygons : First Language, Science and Technology and Mathematics–2005 study

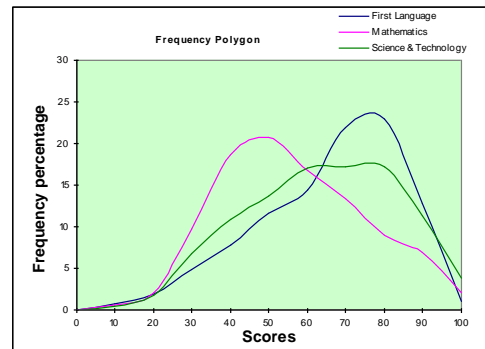


Figure 3.22: Southern Province Frequency Polygons : First Language, Science and Technology and Mathematics–2008 study

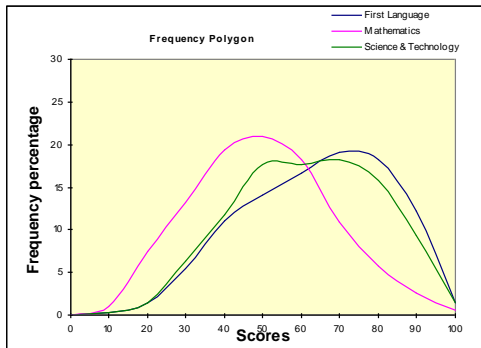


Figure 3.23: Northern Province Frequency Polygons : First Language, Science and Technology and Mathematics–2005 study

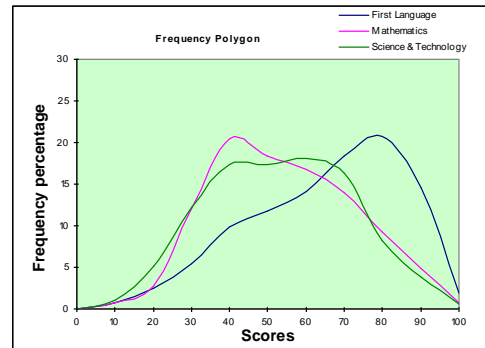


Figure 3.24: Northern Province Frequency Polygons : First Language, Science and Technology and Mathematics–2008 study

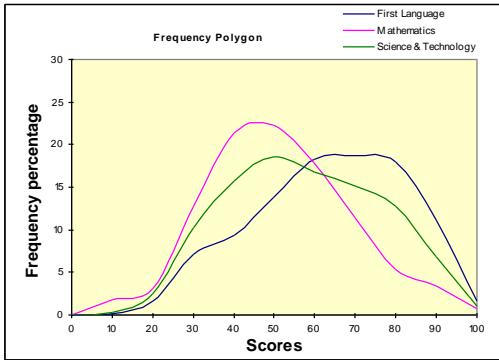


Figure 3.25: Eastern Province Frequency Polygons :First Language, Science and Technology and Mathematics– 2005 Study

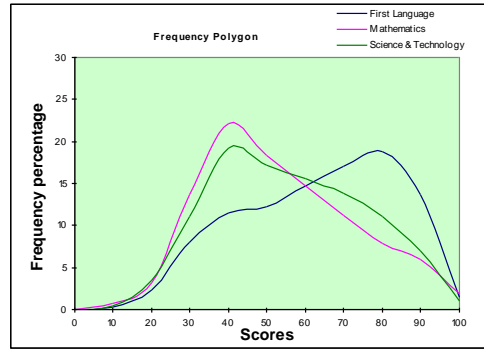


Figure 3.26: Eastern Province Frequency Polygons :First Language, Science and Technology and Mathematics – 2008 Study

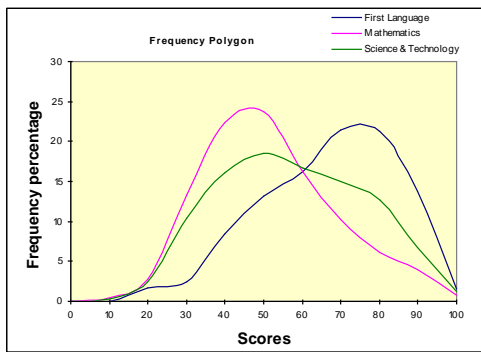


Figure 3.27: North Western Province Frequency Polygons :First Language, Science and Technology and Mathematics– 2005 Study

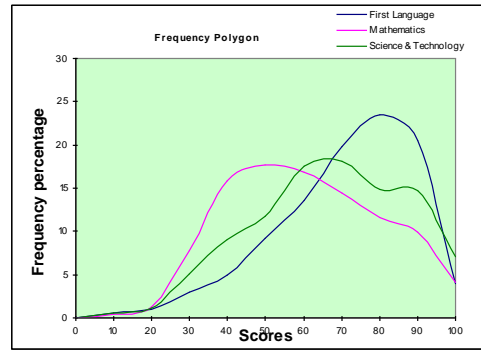


Figure 3.28: North Western Province Frequency Polygons :First Language, Science and Technology and Mathematics–2008 Study

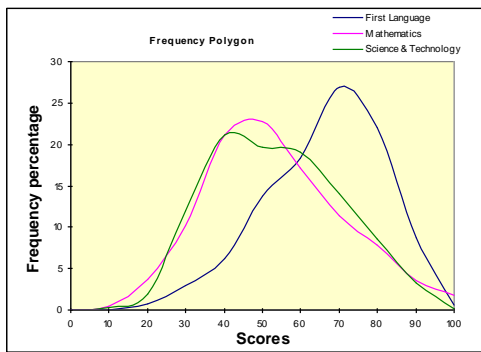


Figure 3.29: North Central Province Frequency Polygons – First Language, Science and Technology and Mathematics–2005 Study

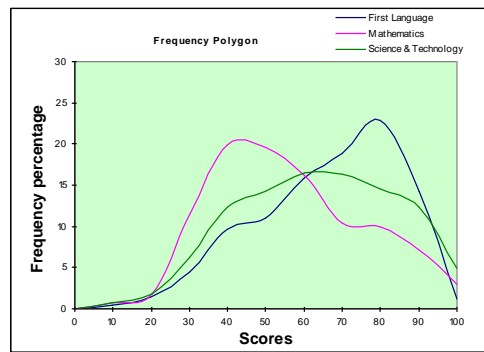


Figure 3.30: North Central Province Frequency Polygons – First Language, Science and Technology and Mathematics–2008 Study

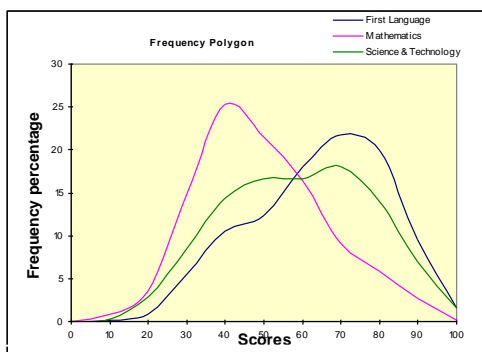


Figure 3.31: Uva Province Frequency Polygons - First Language, Science and Technology and Mathematics-2005 Study

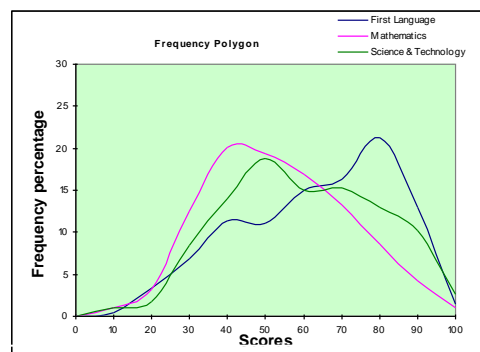


Figure 3.32: Uva Province Frequency Polygons - First Language, Science and Technology and Mathematics-2008 Study

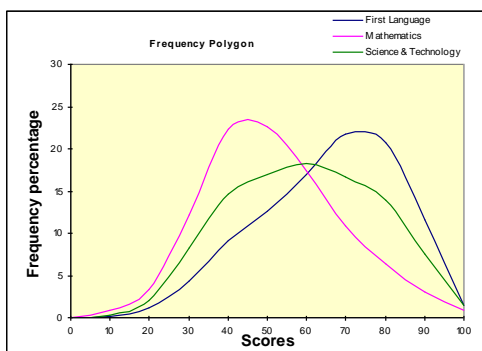


Figure 3.33: Sabaragamuwa Province Frequency Polygons - First Language, Science and Technology and Mathematics-2005 Study

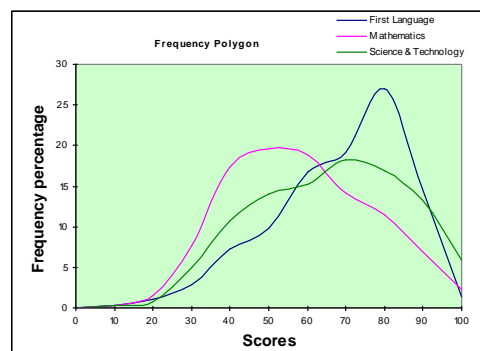


Figure 3.34: Sabaragamuwa Province Frequency Polygons - First Language, Science and Technology and Mathematics-2008 Study

Order of the location of distribution curves noted in national level in 2005 could be seen in Western, Central, Northern, Eastern, North Western, North Central, Uva and Sabaragamuwa Provinces. The curve of the Southern Province were different, the Science and Technology frequency distribution curve was shifted to the right more than the other curves, showing more scores falling within the higher class interval. In year 2008, Southern, Northern, Eastern, North Western, North Central, Uva and Sabaragamuwa Provinces have shown the very same pattern. Western and Central Provinces have deviated slightly from the pattern noted in 2005, showing a total improvement in achievement levels of the students in Science and Technology.

3.3.2 Nature of the Frequency Polygons at Provincial Level

The nature of the frequency polygons for the two years 2005 and 2008 can be studied, using the Figures 3.35 to 3.61. The dotted lines indicates the 2005 frequency distribution curves, and the continuous lines are the 2008 distribution curves.

3.3.2.1 First Language

The unimodal nature of the distribution curve can be seen, in both years. In the year 2005 a large number of scores were piled around a class interval of 60-69. In the year 2008, the highest number of scores have fallen within the class interval of 70- 79, indicating a better performance level in year 2008 relative to year 2005. When the two curves are compared a shift of the frequency polygon to the right can be noted in 2008.

In relation to the provinces a clear shift of frequency polygons to the right can be noted in Southern, Northern, Eastern, and Sabaragamuwa provinces; therefore; that there is sufficient evidence to conclude that the performance levels of students in First Language have gone up in year 2008 relative to year 2005. However, Western, North Western, North Central provinces remain constant, for a shift of the curve to the right is not clearly seen. The larger number of scores have fallen around 80. As a result the percentage falling within the lower class interval has decreased. The frequency polygons in the Central province looks quite different from those of all other provinces; in this province, the percentage of students scoring around 20 have gone up very high in year 2008, indicating a large percentage of students scoring lower marks. (See Figures 3.35-3.43)

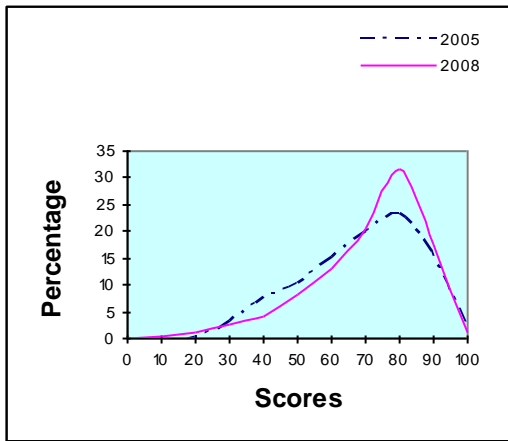


Figure 3.35: Western Province Frequency Polygons in First Language, 2005 and 2008

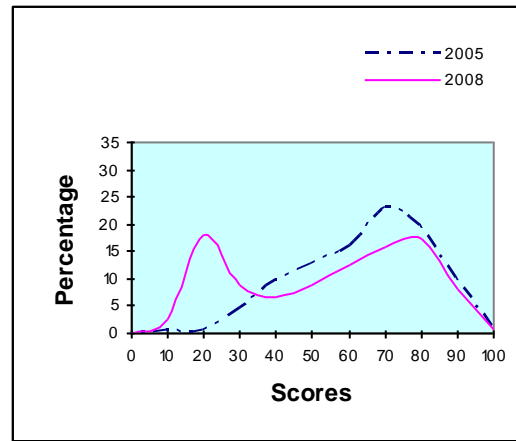


Figure 3.36: Central Province Frequency Polygons in First Language, 2005 and 2008

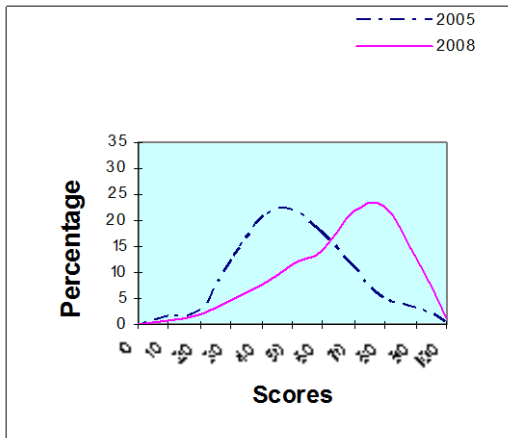


Figure 3.37 : Southern Province Frequency Polygons in First Language , 2005 and 2008

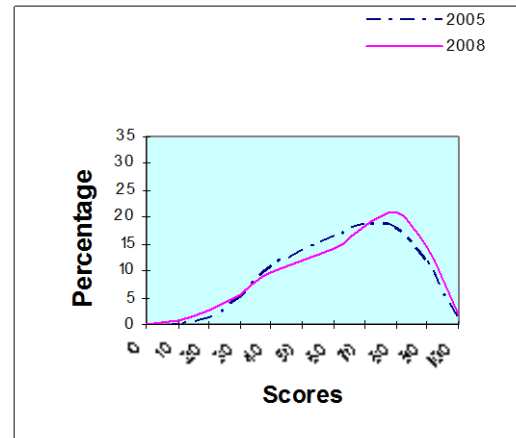


Figure 3.38: Northern Province Frequency Polygons in First Language, 2005 and 2008

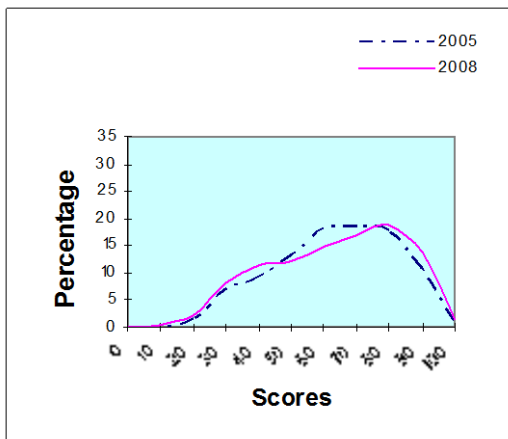


Figure 3.39 :Eastern Province Frequency Polygons in First Language, 2005 and 2008

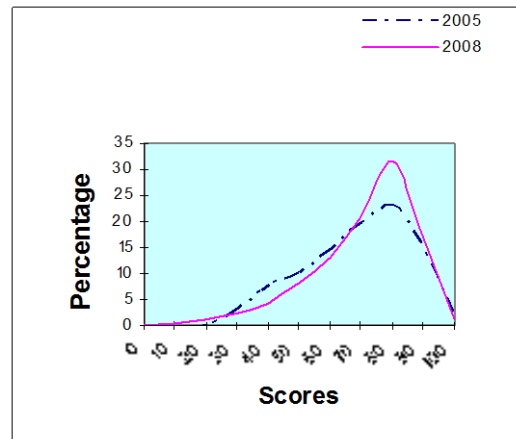


Figure 3.40: North Western Province Frequency Polygons in First Language, 2005 and 2008

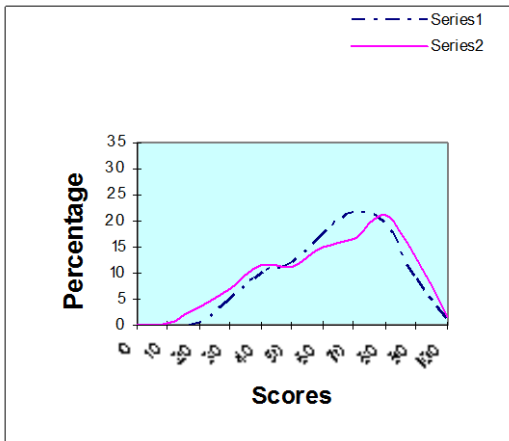


Figure 3.41 : North Central Province Frequency Polygons in First Language -2005 and 2008

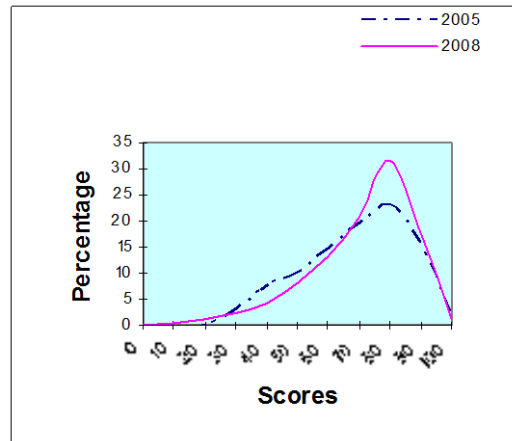


Figure 3.42 : Uva Province Frequency Polygon in First Language -2005 and 2008

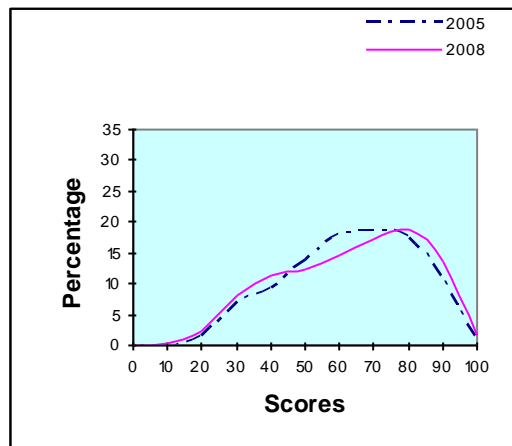


Figure 3.43: Sabaragamuwa Province Frequency Polygons in First Language-2005 and 2008

3.3.2.2 Science and Technology

The national level Frequency polygon in Science and Technology has shifted to the right, showing a better performance level in 2008 relative to 2005.

In Science and Technology a shift of the frequency polygon curves to the right indicating a better performance in year 2008 than in year 2005; this trend is noted in the Western, Central, Southern, North Western, North Central and Uva Provinces. In the Northern Province, a clear shift of the frequency polygon to the left is noted, indicating that the overall performance of Northern Province in Science and Technology has gone down. The position of Eastern and Sabaragamuwa Province curves are somewhat similar, but not indicating a clear, total change. (See Figures 3.44 - 3.52)

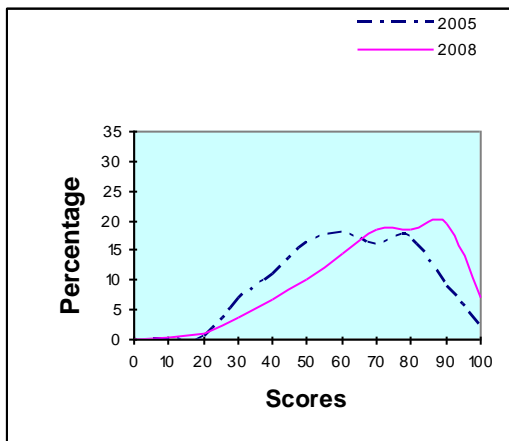


Figure 3.44: Western Province Frequency Polygons in Science and Technology -2005 and 2008

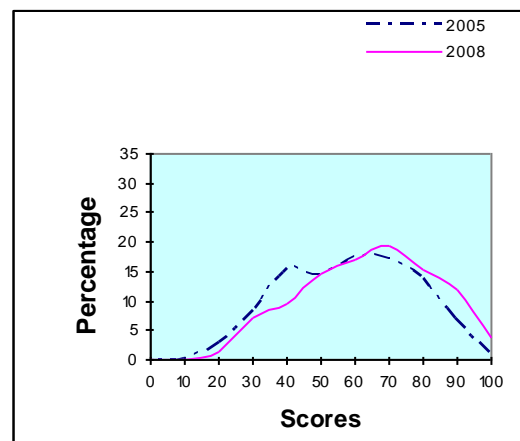


Figure 3.45: Central Province Frequency Polygons in Science and Technology -2005 and 2008

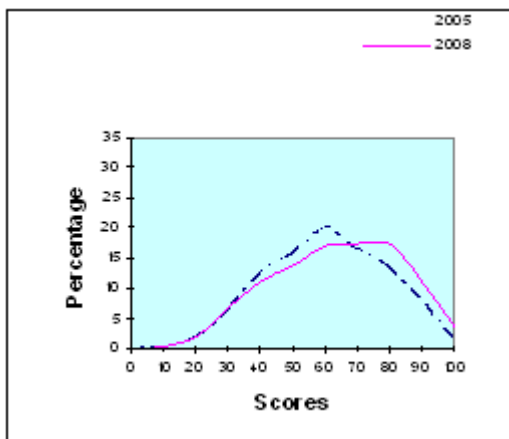


Figure 3.46: Southern Province Frequency Polygons in Science and Technology -2005 and 2008

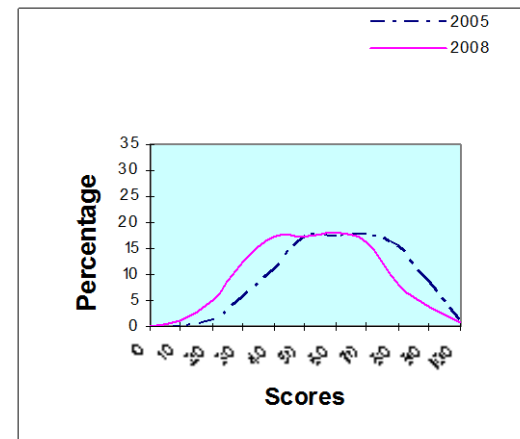


Figure 3.47: Northern Province Frequency Polygons in Science and Technology -2005 and 2008

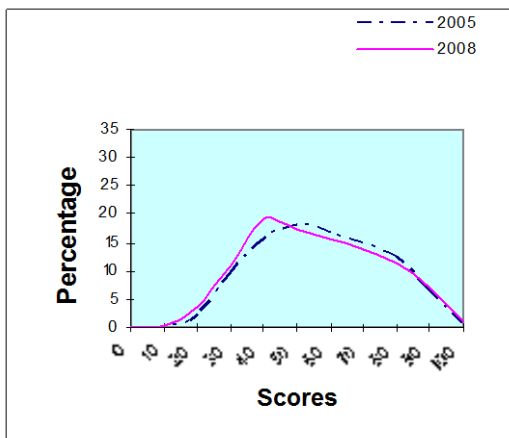


Figure 3.48: Eastern Province Frequency Polygons in Science and Technology -2005 and 2008

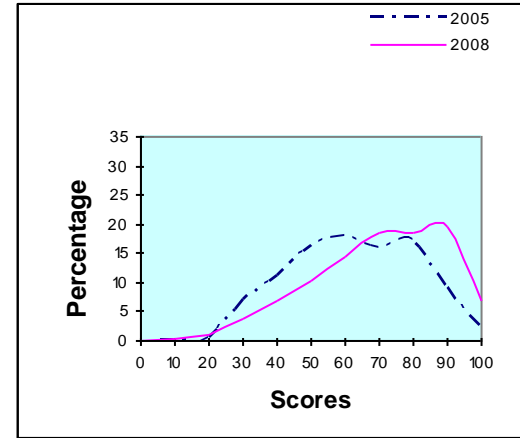


Figure 3.49: Northern Western Province Frequency Polygons in Science and Technology -2005 and 2008

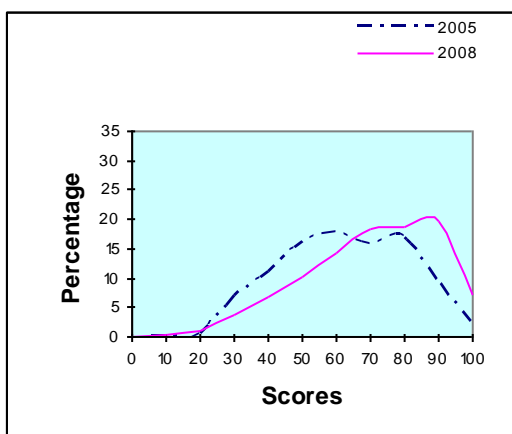


Figure 3.50: North Central Province Frequency Polygons in Science and Technology -2005 and 2008

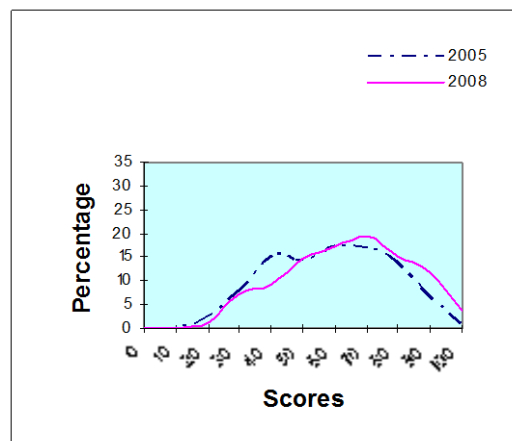


Figure 3.51: Uva Province Frequency Polygons in Science and Technology -2005 and 2008

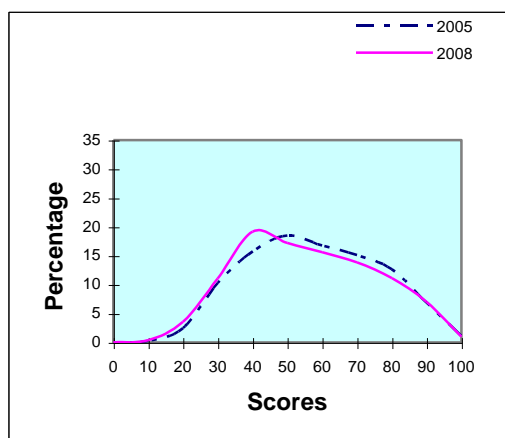


Figure 3.52: Sabaragamuwa Province Frequency Polygons in Science and Technology -2005 and 2008

3.3.2.3 Mathematics

The national level frequency polygons in Mathematics, for both years 2005 and 2008, are unimodal. There is a large improvement in performance levels of students in Mathematics at national level, in year 2008.

This state of improvement can be seen clearly in Western, Central, Southern, Northern, Eastern, North Western, North Central, Uva and Sabaragamuwa Provinces. However, the improvement in Western, North Western and Sabaragamuwa seems larger than in the other provinces. (See Figures 3.53 - 3.61)

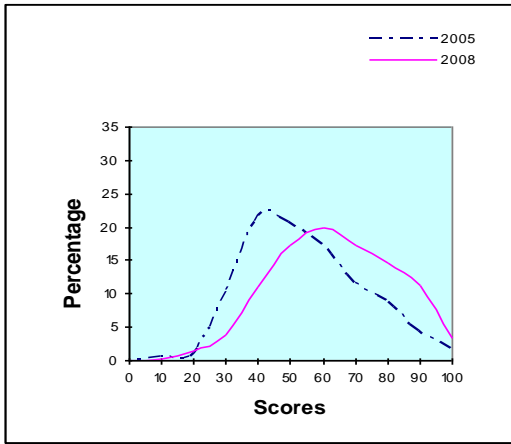


Figure 3.53: Western Province Frequency Polygons in Mathematics -2005 and 2008

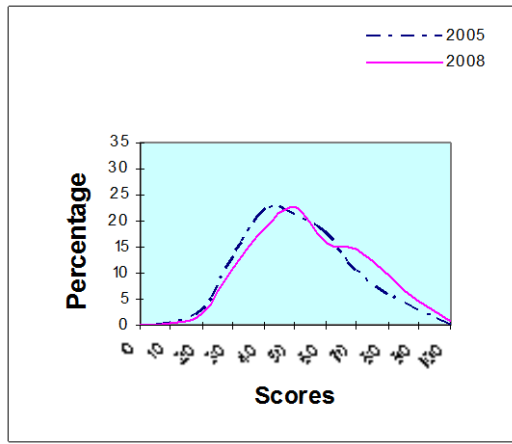


Figure 3.54: Central Province Frequency Polygons in Mathematics -2005 and 2008

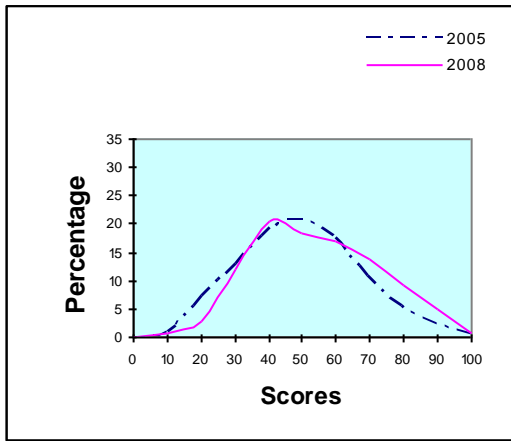


Figure 3.55: Southern Province Frequency Polygon in Mathematics, 2005 and 2008

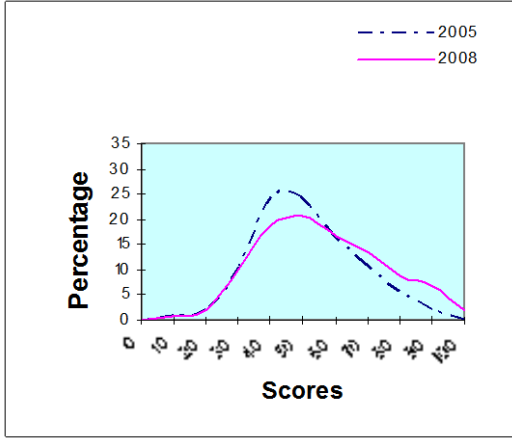


Figure 3.56: Northern Province Frequency Polygons in Mathematics- 2005 and 2008

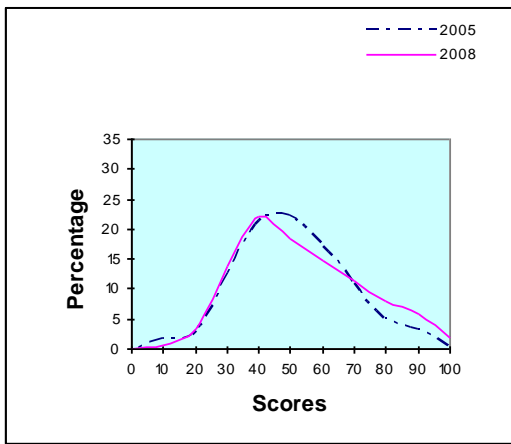


Figure 3.57: Eastern Province Frequency Polygons in Mathematics- 2005 and 2008

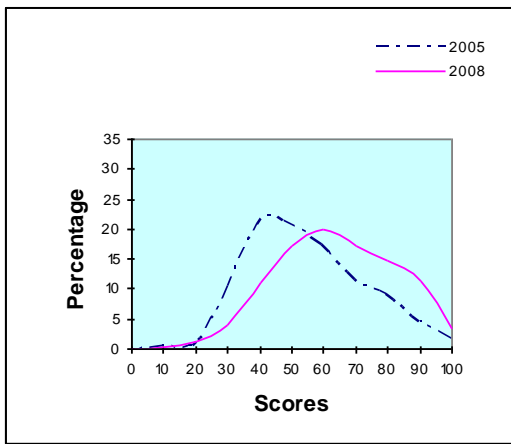


Figure 3.58: North Western Province Frequency Polygons in Mathematics- 2005 and 2008

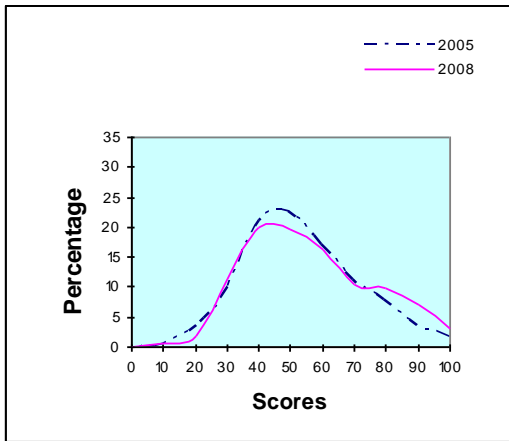


Figure 3.59: North Central Province Frequency Polygons in Mathematics - 2005 and 2008

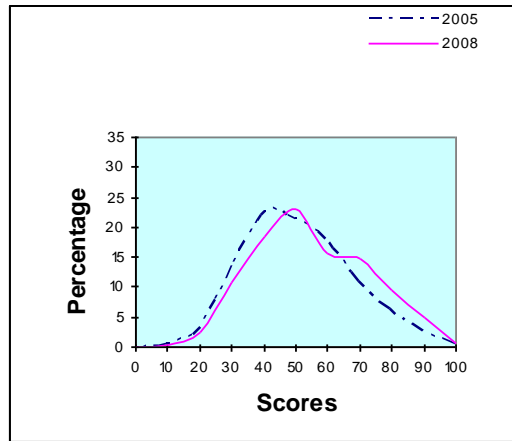


Figure 3.60: Uva Province Frequency Polygons in Mathematics -2005 and 2008

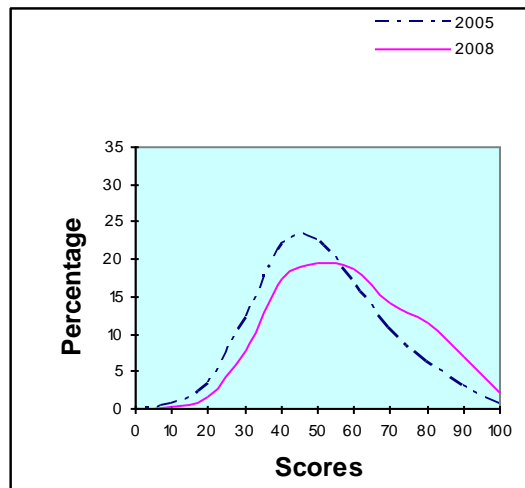


Figure 3.61: Sabaragamuwa Province Frequency Polygons in Mathematics -2005 and 2008

3.3.3 Skewness Values of the Frequency Polygons at Provincial Level

Skewness refers to the trailing off of scores towards extremes in one direction, away from the bulk of cases; a skewness value of +1 shows rather extreme positive skewness and a value of -1 shows rather negative skewness. When the skewness values at national level were analyzed, it was seen that a trailing off of scores towards the higher end, in all three subjects. The performance of students in year 2008 has been better, in all three subjects. Skewness values of the provincial level frequency polygons of the three subjects for the years 2005 and 2008 are given in Table 3.8.

Table 3.8 - Skewness Values of Frequency Polygons in First Language, Science and Technology and Mathematics at Provincial Level. (2005 and 2008)

Province	Skewness					
	First Language		Science and Technology		Mathematics	
	2005	2008	2005	2008	2005	2008
Western	- 0.512	-1.022	- 0.120	-0.568	0.360	-0.089
Central	-0.456	-0.315	-0.053	-0.148	0.350	0.217
Southern	-0.532	-0.621	-0.098	-0.186	0.332	0.324
Northern	-0.311	-0.498	-0.136	0.051	0.212	0.187
Eastern	-0.311	-0.297	-0.019	0.182	0.259	0.449
North Western	-0.490	-0.743	0.078	-0.18	0.502	0.242
North Central	-0.517	-0.454	0.213	-0.014	0.378	0.539
Uva	-0.351	-0.385	-0.072	0.038	0.389	0.276
Sabaragamuwa	-0.413	-0.626	-0.031	-0.155	0.273	0.271

In year 2008, skewness values of the frequency polygons at national level show a better performance level in all three subjects. In Science and Technology, the minus values in skewness values are increased in national level. In Science and Technology plus values has reduced; both confirm that the scores are trailing off towards the higher end.

At provincial level, in all provinces First Language skewness values give minus figures, for both years and the Western Province shows the largest. Southern, Northern, North Western, Uva and Sabaragamuwa Provinces show larger minus skewness values in year 2008 relative to those in year 2005. This figure highlights that there were more higher scores in First Language in all these provinces. In the Central, Eastern and North Central Provinces though there are minus values in skewness, they have come down in year 2008, this indicates that the performance of students in First Language in these provinces in the 2008; study shows a relative slack in improvement. In Science and Technology skewness, values of Uva, Northern and Eastern Provinces which had shown minus values in 2005, have become plus values in 2008. This indicates that the students have not been able to score high marks in 2008 relative to 2005, in the Provinces Northern, Eastern and Uva. In all other provinces, there are lighter scores in Science and Technology in

year 2008 than in year 2005. The differences seen in skewness values, either minus values becoming larger or the plus values becoming minus values is noted in 2005 and 2008. In Mathematics, all the skewness values in the Western Province are plus values, in year 2008. However, it is seen that the plus skewness values in the Provinces such as Western, Central, Southern, Northern, North Western and Sabaragamuwa have reduced indicating that students have scored higher marks. The two Provinces, Eastern and North Central have indicated larger positive skewness values in year 2008 than in 2005, indicating a lowering of the percentage of students who have scored in Mathematics. When all three subjects are considered according to the skewness values Western Province has performed well. The position of Eastern Province is poor, in all three subjects.

3.4 Summary

The order of the location of the frequency polygon at national level is similar, in both years. These distribution curves indicate that achievement levels in First Language is high. Achievement levels in Science and Technology shows an average level. In Mathematics the achievement levels are low. When the nature of the frequency polygons are studied the unimodal nature of the curves remain as it was for both years. In the subject First Language, in year 2008 the highest number of scores fell within the class interval of 70-79 indicating a better performance level than in year 2005. In Science and Technology the frequency polygons have shifted to the right, showing an increase in achievement level in 2008. In Mathematics too the same pattern of shift from left to the right indicates an improvement in student achievement level in 2008. The skewness values of the frequency polygon has changed in all three subjects, showing better values in 2008 relative to 2005. In both years First Language and Science and Technology gives minus values. Yet, these values in 2008 are larger than the values in 2005. In Mathematics, the plus values in 2008 are lower than the those of 2005. All these confirm that more scores are trailing off towards the higher end, indicating better performance levels of students. National level mean values in Science and Technology have increased, showing an improvement in 2008. In First Language, the mean difference between

the two years gives a minus value which is very small. This indicates that the average performance in First Language has not changed during the two years. When the percentage of students below and above mean values are considered in First Language and Science and Technology a larger percentage of students are seen above mean values indicating that performance levels of students have gone up in 2008. In Mathematics there is no change in the percentage values. According to the frequency distribution of scores in all three subjects there is an increase of the percentage of students falling within the higher class interval, showing an upward movement in the performance levels of students. Percentile values show that the percentage of students who are at the 25th percentile have come down in First Language and gone up in Science and Technology and Mathematics. In the 75th percentile it is seen that all the values in 2008 are larger than in 2005, showing an improvement in average performance level. When the order of the location of the frequency polygon in the three subjects at provincial level are considered Western, Central, Northern, Eastern, North Western, North Central, Uva and Sabaragamuwa Province. The nature of the frequency polygons at provincial level in to First Language, is considered a clear shift of the curve to the right can be seen in Southern, Northern, Eastern and Sabaragamuwa Provinces. In Science and Technology a shift of the frequency polygon to the right indicates a better performance in year 2008 than in year 2005 in Western, Central, Southern, North Western, North Central and Uva Provinces. In Mathematics, a clear improvement can be seen in Western, central, Southern, Northern, Eastern, North Western, North Central, Uva and Sabaragamuwa Provinces. When the skewness values in frequency polygons are considered in First Language Western, Southern, Northern, North Western, Uva and Sabaragamuwa Provinces show an increase in the performance of the students. In Science and Technology Uva, Northern and Eastern Provinces have not been able to score higher in 2008 relative to 2005. In Mathematics Western, Central, Southern, Northern, North Western and Sabaragamuwa Provinces have shown an improved level of performance. The position of Eastern Province is poor in all three subjects where as the position of Western Province has done very well in all three subjects.

Key Points

General Patterns in Performance of Students

The Order of the Location of the Frequency Polygon at National Level

- Similar in both years
- Achievement levels in First Language is high
- Achievement levels in Science and Technology show an average level.
- In Mathematics the achievement levels are low.
- Western, Central, Northern, Eastern, North Western, North Central, Uva and Sabaragamuwa Provinces show the same pattern of performance.

Nature of the Frequency Polygons

- Unimodal in both years
- In First Language, level of performance is better than in year 2005
- Frequency polygons of First Language in Southern, Northern, Eastern and Sabaragamuwa provinces show a shift to the right
- In Science and Technology, there is an increase in achievement level, in 2008
- Frequency polygon shifted to the right, in Western, Central, Southern, North Western, North Central and Uva Provinces.
- In Mathematics, there is an improvement in student achievement level in 2008
- Frequency polygon shifted to the right, in Western, Central, Southern, Northern, Eastern, North Western, North Central, Uva and Sabaragamuwa Provinces

Skewness Values

- In First Language, more scores trail off towards the higher end indicating better performance levels
- An increase in performance in Western, Southern, Northern, North Western, Uva and Sabaragamuwa Provinces

- In Science and Technology, more scores are trailing off towards the higher end, indicating better performance levels
- In Science and Technology Uva, Northern and Eastern Provinces have shown lower performance in 2008
- In Mathematics, more scores trail off towards the higher end indicating better performance levels
- In Mathematics, Western, Southern, Northern, North Western, and Sabaragamuwa Provinces have shown an improved level in performance

Mean Values

- In First Language, there are very small minus values
- In Science and Technology, there is an improvement in 2008
- In Mathematics, there is an improvement in 2008

Percentage of Students Above the Mean Value

- In First Language there is an improvement in year 2008
- In Science and Technology there is an improvement in 2008
- In Mathematics there is an no improvement

Frequency Distribution of Scores

- First Language- increase in the percentage falling within the higher class intervals
- In Science and Technology, there is an improvement in 2008
- In Mathematics, there is no improvement

75th Percentile

- In First Language, the improvement in achievement is larger in 2008 relative to that in 2005
- In Science and Technology, the improvement in achievement is larger in 2008 relative to that in 2005
- In Mathematics, the improvement in achievement is larger in 2008 relative to that in 2005

