

School Name

**PAT Growth Year Level Report
2009 - 2011**



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ATSI: Aboriginal and Torres Strait Islander

Bands:

Band	Percentile Rank
P10	10th percentile and below
P25	11-25th percentile
P50	26 – 50th percentile
P75	51 -75th percentile
P90	76 – 90th percentile
P100	above 90th percentile

Boxplot: Boxplots are graphical representations of data, and are used here to describe the variation or spread of scale scores. The length of the box represents the difference between the 25th and 75th percentiles: the middle 50% of scores are within this box. The length of the box indicates the spread, so a larger box suggests that the middle 50% covers a wider range of scores. The line within the box is the median (or middle score, if all the scores were ranked), and spread is further suggested by whether this line is towards the top or bottom of the box: a median in the top half of a box suggests that, of the middle 50% of scores between the 25th and 75th percentiles, more scores were towards the 75th percentile than the 25th percentile. The point to which the line extends below the box indicates the 5th percentile, and the point to which the line extends above the box indicates the 95th percentile. These lines further indicate the spread of scores, as longer lines suggest more extreme scores in that direction.

Cohort: A group of students.

Cut score: Selected points on the score scale of a test. In this report, the cut off score for a percentile rank.

Gain or change: Gain or change of cohort performance is measured by the difference in average scale scores obtained by the matched cohort. A key assumption in measuring gain or change is that test scores have been placed on a common scale, and test scores can be directly and meaningfully compared across Year levels.

Matched Cohort: A group of students who have taken the same scaled test in previous years.

Matched Cohort: A group of students who have completed consecutive ACER TEST scores in previous years.

Mean: The average or central tendency of a distribution.

Median: The middle value of a data set when it has been arranged in ascending order.

p-value: The probability obtained by performing the statistical significance test, i.e. t-test (see page 7).

Percentile: A percentile is the value the scale score below which a certain percent of students fall. For example, the 10th percentile is the score below which 10 percent of the students may be found.

Scale score: Scale score points are different from the “raw score” results that you would get by adding up the number of score points for correct answers on each part of the assessment. It is then possible to make meaningful comparisons of results between different years, and between different Year levels, even though the tests that are administered are not the same.

Standard Deviation (SD): A way to measure the spread of a distribution.

Standard Error of Mean (SE): The standard deviation of the sample mean estimate of a population mean. It is a measurement of sampling error.

Stanine: A stanine is a score from 1 to 9 with a stanine of 9 indicating a very high level of general ability relative to the whole norm reference group, and a stanine of 1 indicating a very low relative achievement. Stanines group together percentile ranks as shown in the table below:

Description	Stanine	Corresponding Percentile Ranks
Very High	9	96 and above
Above Average	8	90 - 95
	7	77 - 89
Average	6	60 - 76
	5	40 - 59
	4	23 - 39
Below Average	3	11 - 22
	2	4 - 10
Very Low	1	3 and below

t-test: The t-test assesses whether the means of two groups are statistically different from each other. The t-test is based on the observation that, when looking at the differences between scores for two groups, the difference is better captured by the difference between group means relative to the spread or variability of their scores.

t-value: The score obtained by performing a t-test.

DATA DESCRIPTION

Table 1 shows the number of students in the school (x) cohort for the same year level across three years from 2009 to 2011.

Table 1 School cohort

Year Level	PAT Cohort in 2011			PAT Cohort in 2010			PAT Cohort in 2009		
	Total	Female	Male	Total	Female	Male	Total	Female	Male
3	167	85	82	140	69	71	161	83	78
4	168	83	85	140	58	82	167	75	92
5	179	81	98	180	81	99	183	88	95
6	179	79	100	140	67	73	182	90	92
7	179	86	93	175	81	94	183	88	95

Table 2 shows means and standard deviations of school (x) cohort from in 2011 and PAT norming sample. The t-test statistics show that the mean scores of school (x) cohorts are higher than mean scores of PAT norming sample of all year levels in 2010. The test form used from 2009 to 2011 for year levels 3 to 7 are test forms 3 to 7, respectively. The PAT Norming sample statistics are drawn according to the year level and the form used for the test.

Table 2 Comparison of School (X) cohort in 2011 to PAT Norming sample

Year Level	Form Used	2011				PAT Norming sample			
		Mean	SD ¹	SE ²	N ³	Mean	SD	SE	N
3	3	111.1	15.8	1.2	167	112.1	13.9	0.4	1056
4	4	124.9	15.7	1.2	168	120.5	14.5	0.4	1097
5	5	127.2	11.6	0.9	179	125.9	13.2	0.4	1119
6	6	132.8	10.5	0.8	179	128.7	12.1	0.4	1074
7	7	137.8	11.7	0.9	179	131.4	12.5	0.4	835

1. SD: Standard Deviation; 2. SE: Standard Error of Mean; 3. N: Number of Students a t-test

Figure 1 shows the score distributions of School (x) cohort in boxplots from in 2011. Box plots are graphical representations of data, and are used here to describe the variation or spread of scale scores. The length of the box represents the difference between the 25th and 75th percentiles: the middle 50% of scores are within this box. From the length of the box you can determine the spread, so a larger box suggests a cohort had a larger number of different scores.

The line within the box is the median (or 50th percentile), and spread is further suggested by whether this line is towards the top or bottom of the box: a median in the top half of a box suggests that of the middle 50% of scores between the 25th and 75th percentiles, more scores were towards the 75th percentile, than the 25th percentile.

The point to which the line extends below the box indicates the 10th percentile, and the point to which the line extends above the box indicates the 90th percentile. These lines further indicate the spread of scores, as longer lines suggest more extreme scores in that direction.

The dotted lines represent PAT norming percentiles, from top and downwards, 90th, 75th, 50th, 25th, and 10th percentiles.

This chart clearly shows that School (x) cohort had higher scores on all the percentiles than PAT norming sample for all year levels in 2010.

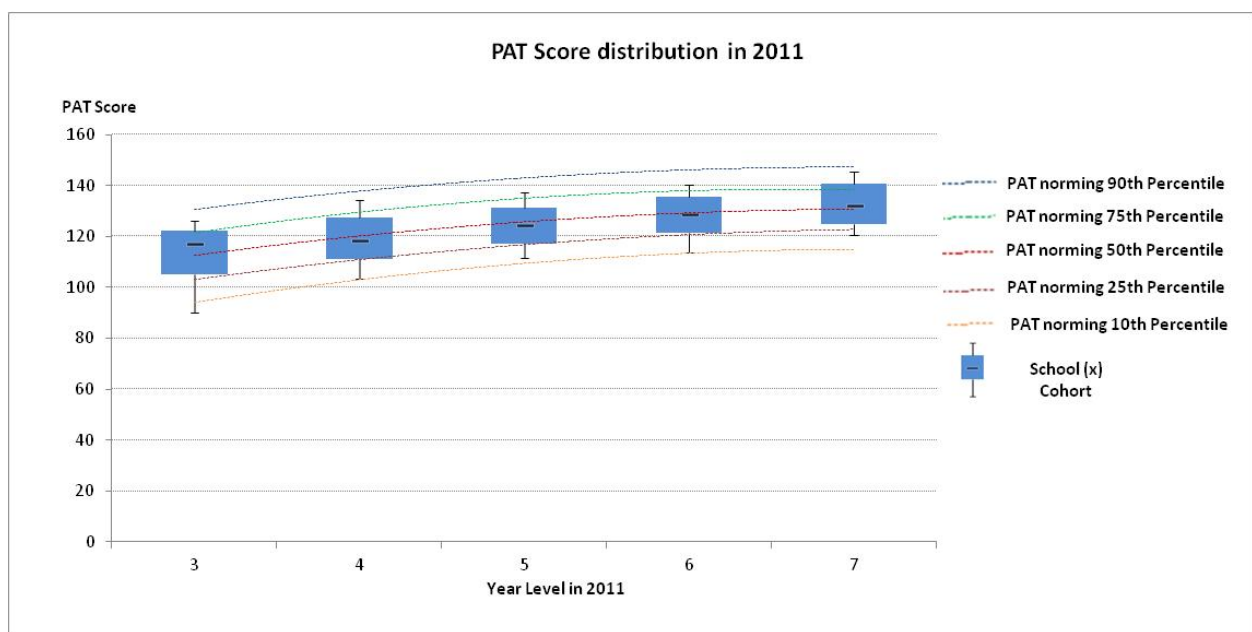


Figure 1 PAT score distribution in 2011

ANALYSIS BY YEAR LEVEL FOR THREE CONSECUTIVE YEARS (2009–2011)

This section analyses the students' performance by year level from 2009 to 2011 (i.e. for PAT for three consecutive years).

Table 3 and Figure 2 show the change in mean PAT scores of students' performance from 2009 to 2011. For the same year level, most positive changes in the mean scores were observed from 2009 to 2010, and the changes are in the range of -0.1 to 3.9 PAT score points, and the changes are statistically significant at year levels 3, 5 and 6 with 95% confidence. All changes in the mean scores from 2010 to 2011 were negative, and the changes are in the range of -3.8 to -6.5 PAT score points, and all the changes are statistically significant with 95% confidence.

Table 3 Students' performance from 2009 to 2011

Year Level in 2011	2009				2010				2011				Change		
	Mean	SD	SE	N	Mean	SD	SE	N	Mean	SD	SE	N	2009-2010	2010-2011	2009-2011
3	111.1	15.8	1.2	167	115.0	15.2	1.3	140	111.2	17.5	1.4	161	3.9	-3.8	0.1
4	124.9	15.7	1.2	168	125.7	11.0	0.9	140	119.2	11.4	0.9	164	0.8	-6.5	-5.7
5	127.2	11.6	0.9	179	130.2	13.0	1.0	180	124.0	10.1	0.7	183	3.0	-6.2	-3.2
6	132.8	10.5	0.8	179	134.5	13.7	1.2	140	128.4	10.6	0.8	182	1.6	-6.1	-4.4
7	137.8	11.7	0.9	179	136.9	12.6	1.0	175	133.0	10.5	0.8	183	-1.0	-3.9	-4.8

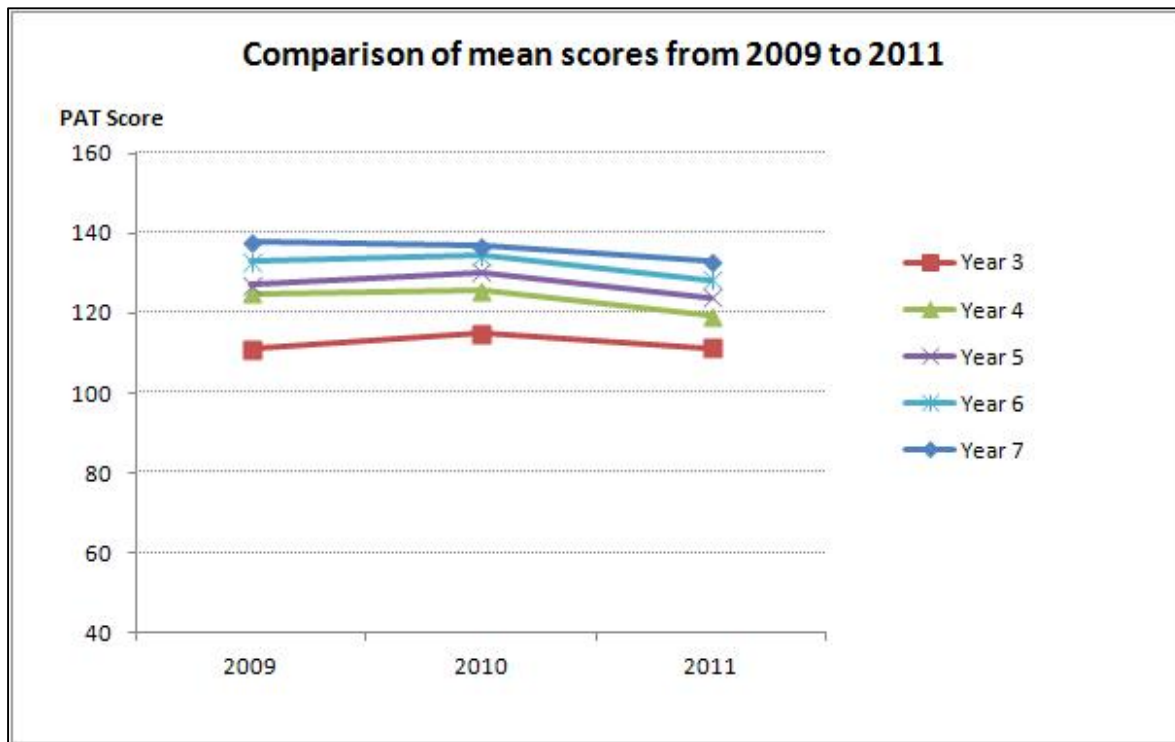


Figure 2 Comparison of mean scores by year level from 2009 to 2011

Table 4 shows the percentile scores¹ (from the 10th (P10²) percentile to the 100th percentile) for PAT cohort by year level from 2009 to 2011. In Table 4 for example, the row for Year 3 in 2009 indicates that the 10th percentile score was 94, and for the same year level in 2010 and 2011, the 10th percentile scores are 99.5 and 90.1 respectively.

Table 4 Percentile scores for School (x) cohort from 2009 to 2011

Year Level	2009						2010						2011					
	P10	P25	P50	P75	P90	P100	P10	P25	P50	P75	P90	P100	P10	P25	P50	P75	P90	P100
Year 3	94	105	112	123	126	128	99.5	110.3	116.9	122.5	131	132	90.1	105	116.9	122.5	126.2	127.8
Year 4	110	119	128	134	139	141	109.6	118.5	127.6	134.2	139.1	141	103.45	111.2	118.5	127.6	134.2	135.7
Year 5	117	121	128	133	139	141.5	117.1	123.1	129.3	138.5	146.4	147.2	111.4	117.1	124.3	131.2	137.38	139.1
Year 6	122	126	134	138	143	144.1	124.4	128.8	135.8	143.1	146.5	148.7	113.65	121.6	128.8	135.8	140.3	142.2
Year 7	124	129	135	146	156	157.6	121.44	129.2	137.1	143	148.3	149.5	120.6	124.9	132.1	140.9	145.5	146.2

Figure 3 shows that for year 3, 2010 has the highest 10th percentile, 25th percentile and 90th percentile, 2009 has the highest 75th percentile and 2011 has the comparable 50th and 75th percentiles with 2010. For Year 4, 2009 has the highest 10th, 25th, and 50th percentiles, while 2010 has the highest 75th and 90th percentile scores. For Year 5 and Year 6, 2010 is higher than 2009 and 2011 in all percentile scores. For Year 7, 2009 has the highest 10th, 75th and 90th percentile scores, while 2010 has higher 25th and 50th percentile scores than 2009 and 2011. Overall, either 2009 or 2010 has higher percentile scores than 2011.

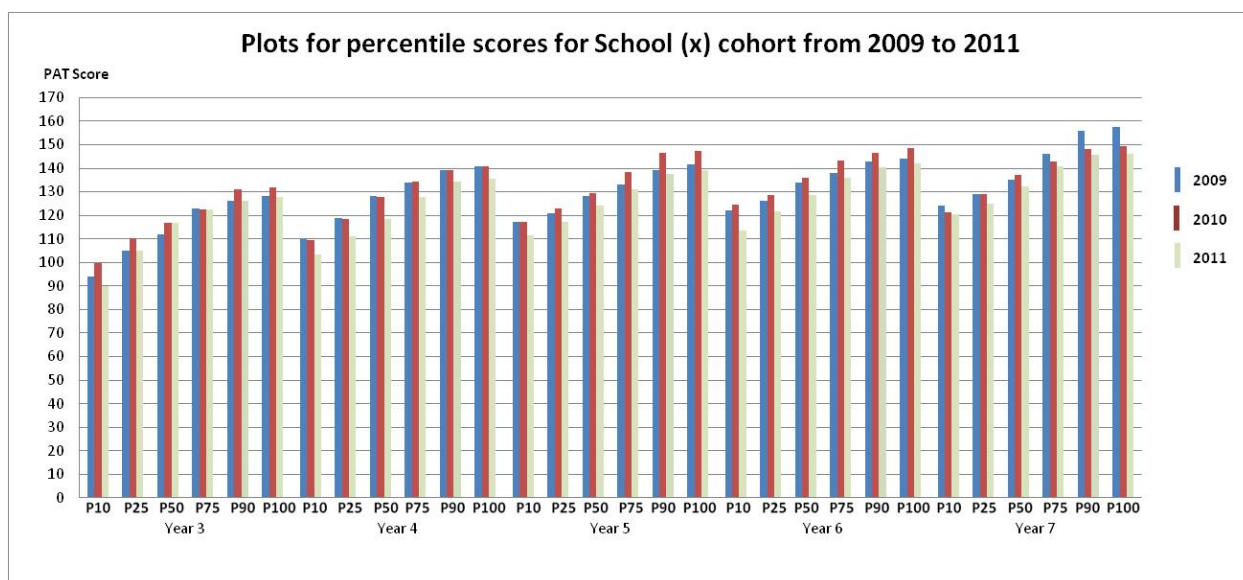


Figure 3 Plots for percentile scores for School (x) cohort from 2009 to 2011

Figure 4 shows the percentile changes in paired boxplots. Box plots are graphical representations of data, and are used here to describe the variation or spread of scale scores. The length of the box represents the difference between the 25th and 75th percentiles: the middle 50% of scores are within this box. From the length of the box you can determine the spread, so a larger box suggests a cohort had a larger number of different scores.

The line within the box is the median (or 50th percentile), and spread is further suggested by whether this line is towards the top or bottom of the box: a median in the top half of a box suggests that of the middle 50% of scores between the 25th and 75th percentiles, more scores were towards the 75th percentile, than the 25th percentile.

The point to which the line extends below the box indicates the 10th percentile, and the point to which the line extends above the box indicates the 90th percentile. These lines further indicate the spread of scores, as longer lines suggest more extreme scores in that direction.

¹ Please refer to Glossary for more information regarding Percentiles

² Please refer to Glossary for more information regarding Bands

A tripled boxplots show the change from 2009 to 2011 with medians connected by a line. The boxplot on the left is for 2009, the boxplot in the middle is for 2010 and the boxplot on the right is the 2011.

The chart indicates that for positive changes in medians were observed from 2009 to 2010 for Year 3, 5, 6, and 7 students, and the negative changes in medians for all year levels were observed from 2010 to 2011.

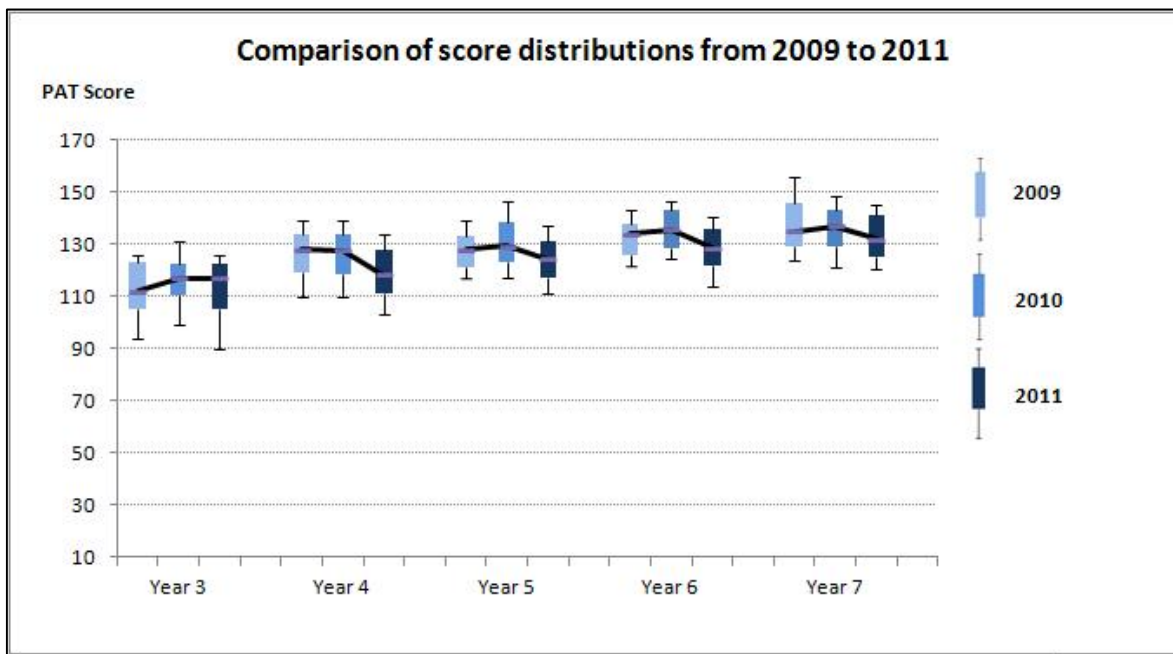


Figure 4 Comparison of score distributions from 2009 to 2011

Before comparing changes between School (x) cohort and PAT Norming sample, school (x) cohort is compared to PAT Norming sample to get an idea of relative performance between these two samples. Table 5 shows that School (x) performance in 2011 had a higher performance in PAT score than PAT Norming sample in mean differences.

Table 5 Comparison between School (x) 2011 students and PAT Norming sample

Year Level	Form Used	2011				PAT Norming sample				Difference		
		Mean	SD	SE	N	Mean	SD	SE	N	Mean	t-value	p-value
3	3	111.2	17.5	1.4	161	112.1	13.9	0.4	1056	-0.9	-0.6	0.54
4	4	119.2	11.4	0.9	164	120.5	14.5	0.4	1097	-1.3	-1.3	0.19
5	5	124.0	10.1	0.7	183	125.9	13.2	0.4	1119	-1.9	-2.3	0.02
6	6	128.4	10.6	0.8	182	128.7	12.1	0.4	1074	-0.3	-0.3	0.74
7	7	133.0	10.5	0.8	183	131.4	12.5	0.4	835	1.6	1.8	0.07

Figure 5 shows the 1 year gain in PAT score comparison between School (x) cohort by mean scores from 2009 to 2011. The chart indicates that School (x) cohort had a relatively lower gain observed than PAT Norming sample in all year levels from 2009 to 2011. From 2010 to 2011, the negative gains have been observed in all year levels.

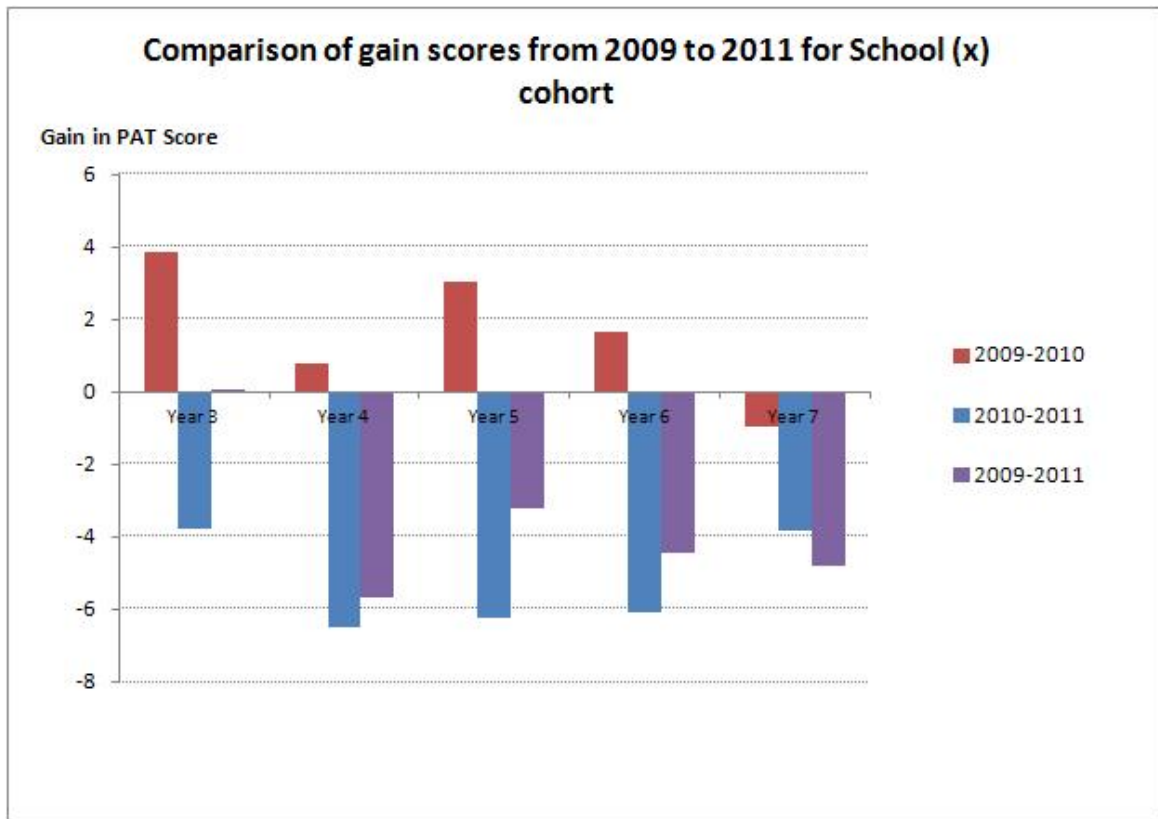


Figure 5 Comparison of gain scores from 2009 to 2011 for School (x) cohort

Table 6 presents the percentile scores for School (x) and PAT Norming sample in 2011. Figure 6 plots the percentile scores for School (x) cohort and PAT Norming sample in 2011.

Table 6 Percentile scores for School(x) in 2011 and PAT Norming Sample

Year Level in 2011	School (x)						PAT Norming Sample					
	P10	P25	P50	P75	P90	P100	P10	P25	P50	P75	P90	P100
3	90.1	105	116.9	122.5	126.2	127.8	94.2	103	112.4	121	130	132.1
4	103.45	111.2	118.5	127.6	134.2	135.7	102.6	111	120.5	130.6	139.1	141.2
5	111.4	117.1	124.3	131.2	137.38	139.1	109.9	117.1	125.9	135	143	145.6
6	113.65	121.6	128.8	135.8	140.3	142.2	113.2	120.2	128.8	137	145	145.9
7	120.6	124.9	132.1	140.9	145.5	146.2	115	123	131	139	148	148.7

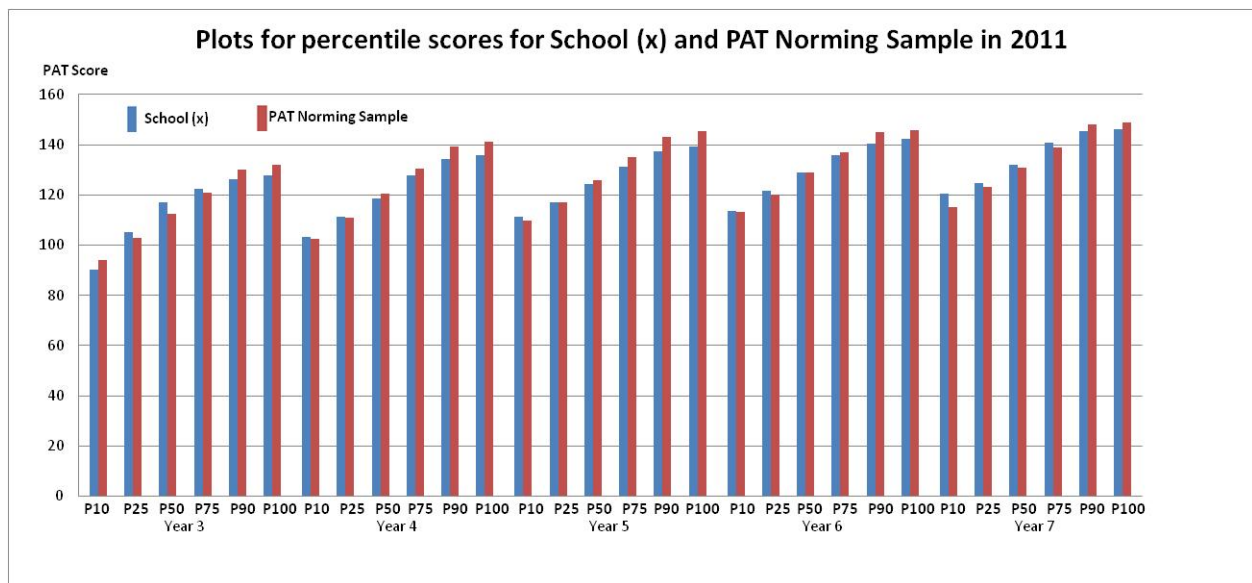


Figure 6 Plots of percentile scores for School(x) in 2011 and PAT Norming Sample

Figure 7 is the stanine distribution chart (please refer to glossary for more information on stanines), for three consecutive years from 2009 to 2011 at year levels 3. For comparison purpose, the PAT Norming stanine distributions are included in the charts. In the tripled stanine distribution, the left distribution refers to School (x) cohort and the right is for the PAT Norming sample.

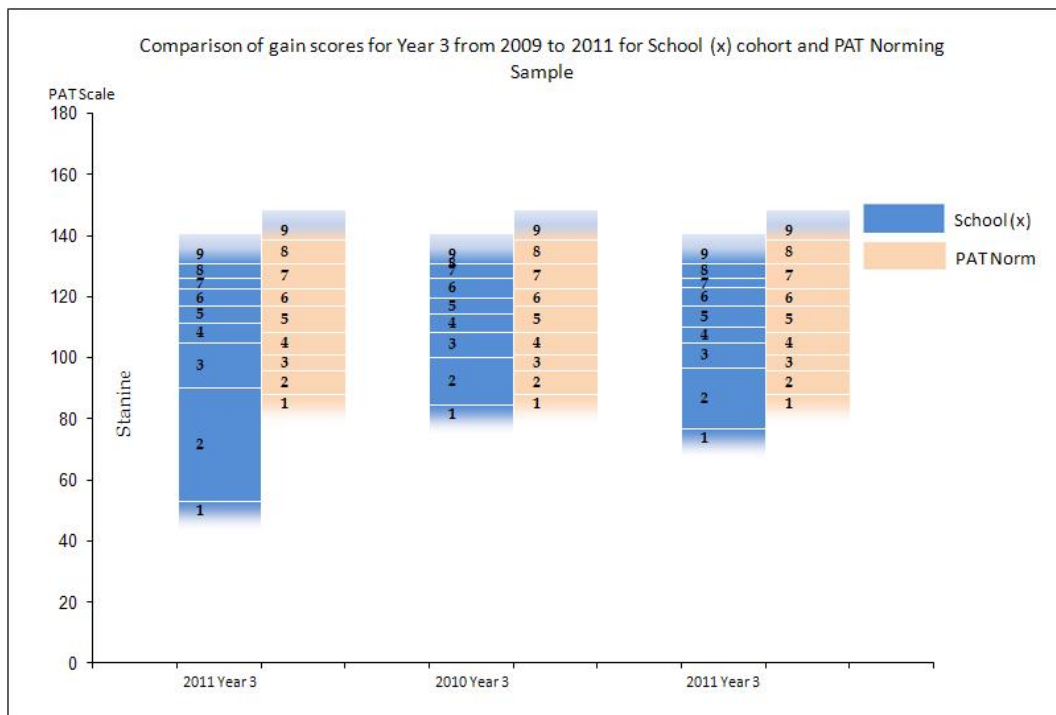


Figure 7 Stanine distribution from 2009 to 2011 at Year 3

ANALYSIS BY YEAR LEVEL BY GENDER FOR THREE CONSECUTIVE YEARS (2009 – 2011)

Table 7 and Table 8 show one- year change of school (x) male and female cohorts respectively in PAT scores from 2009 to 2011. The changes for male cohorts in year 3, 4, 5, 6, and 7 are in the range of 2.4 to 8.3 score points from 2009 to 2010, compared to changes found in female year levels (a range of 4.7 to 7.3). The changes for male cohorts in year 3, 4, 5, 6, and 7 are in the range of -2.4 to -0.2 score points from 2010 to 2011, compared to changes found in female year levels (a range of -5.6 to 0). All changes from 2009 to 2010 are statistically significant with 95% confidence. The remaining section will discuss the analysis results for year levels 3, 4, 5, 6, and 7 to compare male cohort with female cohort in School (x) from 2009 to 2011.

Table 7 School(X) male cohort statistics from 2009 to 2011

Year Level in 2011	2009				2010				2011				Change		
	Mean	SD	SE	N	Mean	SD	SE	N	Mean	SD	SE	N	2009-2010	2010-2011	2009-2011
3	110.5	18.5	2.1	78	115.2	16.8	2.0	71	109.5	14.9	1.6	82	4.7	-5.6	-1.0
4	118.4	11.3	1.2	90	123.8	10.1	1.1	82	123.8	16.3	1.8	85	5.3	0.0	5.3
5	124.0	10.0	1.0	95	129.4	15.0	1.5	99	125.8	9.5	1.0	98	5.4	-3.6	1.8
6	128.6	10.6	1.1	92	135.9	12.8	1.5	73	133.1	12.0	1.2	100	7.3	-2.7	4.6
7	131.3	10.4	1.1	95	136.5	14.1	1.5	94	138.5	12.0	1.2	93	5.2	2.0	7.2

Table 8 School (X) female cohort statistics from 2009 to 2011

Year Level in 2011	2009				2010				2011				Change		
	Mean	SD	SE	N	Mean	SD	SE	N	Mean	SD	SE	N	2009-2010	2010-2011	2009-2011
3	111.9	16.6	1.8	83	114.8	13.6	1.6	69	112.7	16.6	1.8	85	3.0	-2.2	0.8
4	120.1	11.5	1.3	74	128.4	11.7	1.5	58	126.0	15.1	1.7	83	8.3	-2.4	5.9
5	124.0	10.3	1.1	88	131.2	9.9	1.1	81	128.9	13.7	1.5	81	7.2	-2.4	4.9
6	128.3	10.7	1.1	90	133.0	14.6	1.8	67	132.5	8.2	0.9	79	4.7	-0.5	4.2
7	134.8	10.3	1.1	88	137.3	10.7	1.2	81	137.1	11.5	1.2	86	2.4	-0.2	2.2

Figure 8 shows the change of male and female cohorts from 2009 to 2011, in terms of changes in mean PAT scores. The figure shows that positive changes were observed for both female and male cohort in school (x) in all year levels from 2009 to 2010, however, negative changes were observed for both female and male cohort in school (x) at year levels 3, 4, 5 and 6 from 2010 to 2011. From 2010 to 2011, Year 7 male cohort has shown positive changes in mean scores. Female cohort at year levels 4 and 5 has higher rates of change than male cohort from 2009 to 2010. Female cohort has relatively better performance in from 2010 to 2011 than male cohort.

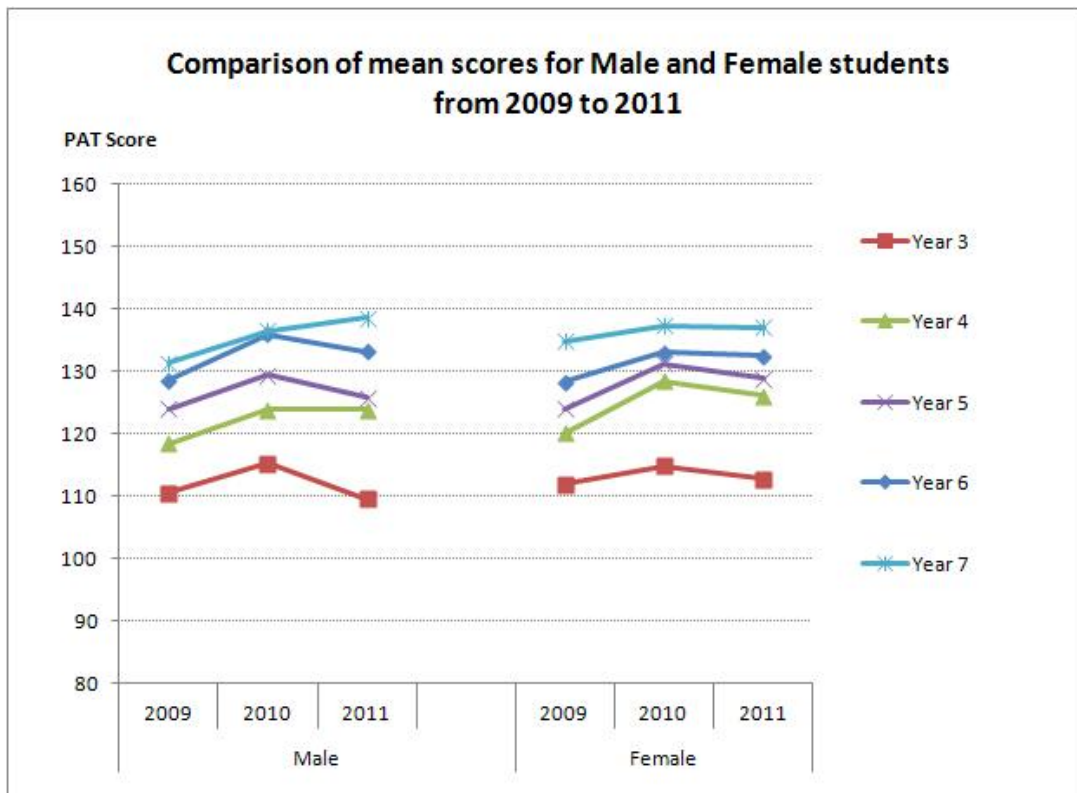


Figure 8 Comparison of mean scores for Male and Female students from 2010 to 2011

Figure 9 compares male against female cohorts in percentiles from 2009 to 2011 for Year 3 (as shown in part (a) of Figure 13).

The lines connect the medians from 2009 to 2011 for male and female cohorts. The slope of the line indicates the rate of change in medians. The figure clearly shows that the female cohorts had marginally higher growth rates in medians, than male cohorts in Year 3.

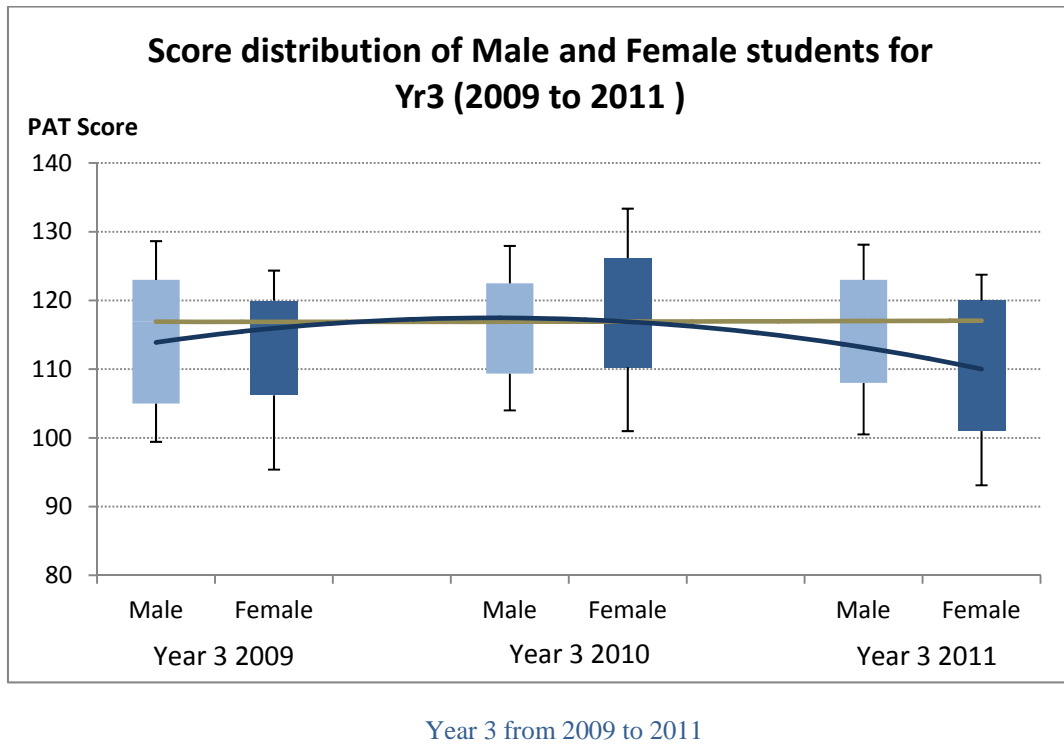


Figure 9 Score distribution of Female and Male students from 2009 to 2011

Figure 10 shows the comparison of gain scores among the School (x) male cohort, female cohort, and PAT Norming sample. The chart indicates that from 2009 to 2010, male cohort has greater gains than both female and PAT Norming sample at year levels 3, 6 and 7. From 2010 to 2011, female cohort has greater gains than male cohort at year levels 3, 5 and 6, however, both female and male cohorts have less gain than the PAT Norming sample at all year levels from 2010 to 2011.

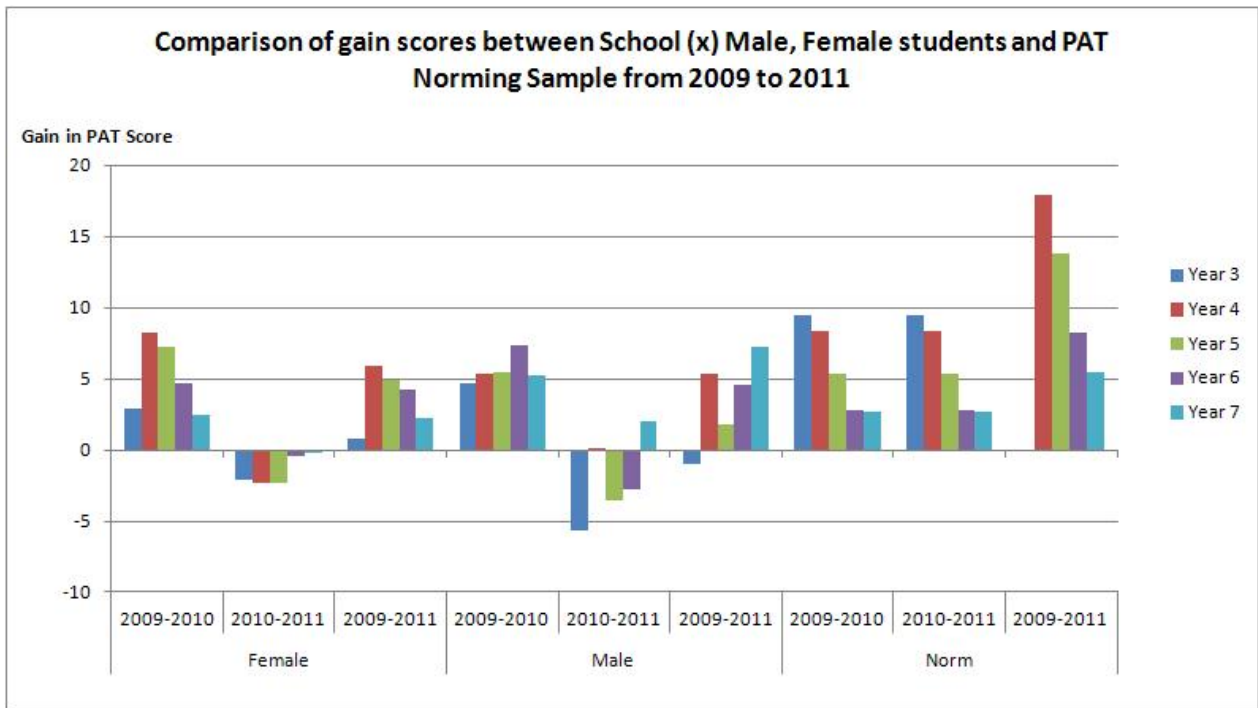


Figure 10 Comparison of gain scores between School (x) Male, Female students and PAT Norming Sample from 2009 to 2011

ADDITIONAL COMMENTS

- Sub group analysis can be included – such as
 - Gender (as per this template)
 - New intake groups (with caution due to numbers)
- The *Executive Summary* will be an overall summary/explanation of what the analysis shows, and will aim to answer specific questions which may have been asked by the client from the onset, (if data allows).
- This template shows analysis for 3 years, but this can be extended for as long as the institution has been testing.
- Minimum numbers for cohorts are required (especially if wanting to analyse class groups or certain sub groups).
- Like school comparison norms are a possibility, although at the moment ACER is only using the National Norm Reference data for the ACER tests.