C.D. Howe Institute
Institut C.D. Howe

Celebrating/Nous célébrons 50 years/ans

e-brief

August 18, 2009

EDUCATION PAPERS

Ontario's Best Public Schools, 2005/06 – 2007/08: An Update to *Signposts of Success* (2005)

By
David Johnson

- "Good schools" in Ontario have principals, teachers and other staff who are making a positive difference in student performance, regardless of their students' socio-economic backgrounds.
- This study screens out the influence of socio-economic factors on how a school's students perform on Ontario's standardized tests at the end of Primary Division (Grade 3) and Junior Division (Grade 6). This allows the author to identify those schools that perform better or worse than other schools with students of similar backgrounds.
- The resulting school ratings by percentile are useful not only to parents, but also to school board administrators and education officials who wish to identify schools whose practices deserve imitation.

How do parents, teachers, taxpayers and school administrators know if children are attending a good school? Standardized test results in reading, writing and mathematics offer one way when analyzed appropriately. This *e-brief* answers that question with a methodology that filters out the influence of socio-economic background on student performance. This allows the study to identify schools where the quality of principals and staff, for example, has made a difference in student performance compared to other schools with students of similar backgrounds. It thus allows a fair comparison between schools.

Ontario's standardized test results are the starting point for the study. In Ontario, the Education Quality and Accountability Office (EQAO) conducts an annual assessment of learning by all elementary school students. Students are tested at the end of the Primary Division (Grade 3) and at the end of the Junior Division (Grade 6). Rankings of schools from unadjusted test scores reflect not only the school's relative success in imparting skills, but the socio-economic characteristics of the school's community. This gives lower rankings to schools in disadvantaged neighbourhoods and higher rankings to schools in privileged neighbourhoods.

In a book published in 2005 *(Signposts of Success)*,[1] I developed a method to separate the influence of socio-economic factors from the influence of schools. That research showed that between 40 and 50 percent of the variation in schools' average test scores (averaged over many tests over many years) is explained by

1 Similar school ratings are published by the C.D. Howe Institute for schools in Alberta and British Columbia.

variation in schools' socio-economic environments. It is reasonable to infer that much of the remaining variation reflects factors specific to a school. The quality of the principal, the teachers and other staff is the leading factor specific to each school, although other factors could affect performance at a specific school over many students and years. Adjusting test scores to remove the influence of socio-economic factors yields measures of relative school performance that are more representative of a school's actual effectiveness than the rankings based on raw annual results. These measures lead us to identify schools to be emulated within groups of schools serving students from the same background. This *e-brief* and the associated database offer an updated set of school ratings using EQAO Primary and Junior Division test results from the three academic years 2005/06, 2006/07 and 2007/08.

In EQAO tests of reading, writing and mathematics, a student meets or exceeds the provincial standard if he or she achieves a Level 3 or a Level 4 on an assessment. The EQAO reports the percentage of all students at each school writing the Primary or Junior assessment who achieve at Levels 1, 2, 3 and 4 (or are exempted), so long as there are 15 or more students at that school in that grade. The province has a "target" that 75 percent of all students should achieve these standards.[2] A "good school" might be a school achieving this target; however this absolute performance indicator may be impossible to achieve for some schools in disadvantaged areas and, conversely, may be easy to achieve for some schools with advantaged students.

In *Signposts of Success* and subsequent reports, I provided an alternative definition of a "good school." The first step in creating this category is to determine how schools did on a given test in a given year relative to the rest of the province. Each school has an actual adjusted pass rate, plotted on the vertical axis of Figure 1. The adjusted pass rate is the school pass rate minus the provincial average pass rate, averaged over three years and three tests. For example, Buchanan Public School in Toronto has an adjusted pass rate of zero because its students obtained the average score in Ontario over the three years of data on the Primary Division tests.

The next step is to predict the performance at each school based on many socio-economic factors. This predicted adjusted pass rate is measured on the horizontal axis.[3] With this update, there are two sources of data on student social and economic characteristics. By linking the location of students' homes to very small geographic units, we can use detailed socio-economic data in the 2006 Census to draw an accurate picture of the family backgrounds of students at elementary schools in Ontario. The EQAO also collects some social and economic characteristics that directly describe the students participating in the assessments.[4] The next step is to estimate the statistical relationship between social and economic variables and average test scores in Ontario schools.[5] This relationship is represented by the upward sloping

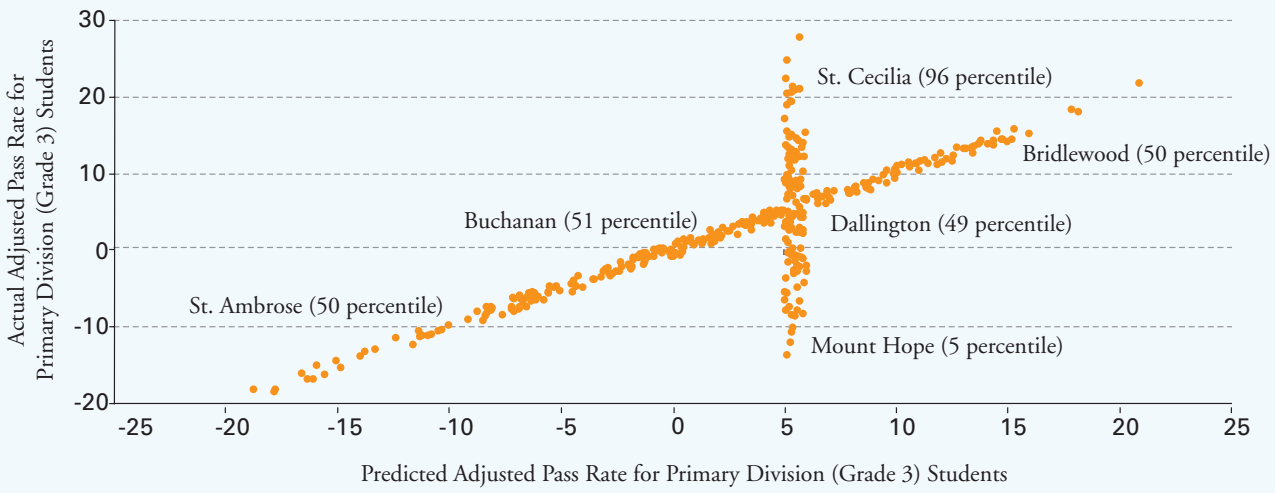
2 The percentage of all students at a school who achieve Level 3 or Level 4 is sometimes called the school's pass rate on that assessment. It is important that all students are in the denominator in the calculation of the pass rate and the number of students with Level 3 or Level 4 scores are in the numerator of the pass rate. Thus students who are absent, who are exempt or who write an assessment with any score that is not Level 3 or Level 4 are students who do not pass.

3 It is important to subtract the provincial average pass rate from the school's pass rate in each year on each assessment. The average pass rate varies greatly across the reading, writing and mathematics both within and across the grades, the years and the language of assessment. Even within the same grade and assessment, the provincial average pass rate rises and falls. Using the deviation from the provincial pass rates allows averaging across years and assessments at a school.

4 The variables used to predict the school's adjusted pass rate are: (from the Census) percentage of families where children have a single parent; percentage of the population identified as aboriginal; percentage of occupied dwellings that are detached homes; percentage of the population that moved in the past year; percentage of the population 20 and over without a high school diploma; percentage of the population 20 and over with some university education; and percentage of the population speaking an official language as their mother tongue; and (from the EQAO context variables) percentage of students eligible for the assessment that are female; percentage of students eligible for the assessment born outside Canada; percentage of students eligible for the assessment that immigrated to Canada in the last three years; and the percentage of students eligible for the assessment who are classified with special needs (not gifted). Other variables not used to predict the pass rate are included in the school profiles released with this *e-brief* so that interested parties will know all the data available to draw a socio-economic picture of Ontario schools. Variables not used to predict the pass rate were either not statistically significant predictors or were replaced by equivalent variables. Where there are two similar variables – for example the EQAO-based measure of the percentage of students born outside Canada – the EQAO-based measures replaced the census-based measure. Adjusted pass rates are predicted only if there were at least 45 students eligible for the assessment usually, but not always, over three years of assessments.

5 Chapters 4 and 6 in *Signposts of Success* go through that methodology in detail.

Figure 1: Actual and Predicted Test Scores of Selected Primary Division (Grade 3) Schools



Note: For the schools along the upward sloping line, the actual value of the adjusted pass rate is the same as the predicted value.

Sources: Author's calculations; Statistics Canada; EQAO.

line of dots in Figure 1 because schools with higher socio-economic profiles are expected to do better. For the schools along the upward sloping line, the actual value of the adjusted pass rate is the same as the predicted value.

A school like St. Ambrose Catholic Elementary School in Waterloo, for example, has social and economic factors that predict an adjusted pass rate 10 percentage points less that the provincial average. Equivalently Bridlewood Junior Public School in Toronto is predicted to have a pass rate 13 percentage points higher than the provincial average. Buchanan is an average school in the province with a predicted adjusted pass rate and an actual adjusted pass rate of zero.

St. Ambrose, Buchanan, and Bridlewood are all equivalent schools, because they all have adjusted actual pass rates equal to the adjusted pass rate predicted for schools with their socio-economic characteristics. Despite its much higher adjusted pass rate, Bridlewood is no better than St. Ambrose – the higher adjusted pass rate at Bridlewood reflects the fact it draws its students from a more "privileged" neighbourhood. Once this relationship is estimated, I calculate the difference between the predicted and actual scores for every Ontario school and calculate a better measure of a school's quality than the school's pass rate.

The vertical line with schools labelled Mount Hope, Dallington and St. Cecilia are all schools where the mix of social and economic characteristics predict a pass rate 5 percentage points higher than the provincial average. Dallington Public School's actual pass rate is 5 percentage points higher than the provincial average; that is, Dallington's primary students do as predicted by their social and economic background. However, the pass rate at Mount Hope School is 10.7 percentage points below the provincial average, far lower than expected. On the other hand, the pass rate at St. Cecilia Catholic School is 22.3 percentage points above the provincial average instead of the 5 percentage points expected from a school with students having the background of those at St. Cecilia.

Finally, I express school performance as a percentile. These are in parentheses in Figure 1. A percentile score of 50 indicates that, compared to schools with students that have similar social and economic characteristics, a school is an average school: half of similar schools are better and half of similar schools are worse. On the other hand, a percentile score of 96 for St. Cecilia, for example, says that it is better than 96 percent of schools whose students have similar social and economic characteristics. The Grade 3 outcomes at this school are very good. The percentile score of 5 at Mount Hope indicates that among schools with students from the same social and economic background, 95 percent of schools do better than the Mount Hope School in Grade 3. There is room for improvement at schools like Mount Hope. Percentile scores for all Ontario schools where data are complete for the three years can be found in *Ontario Public Schools Performance – Updated with Results from 2005-06, 2006-07 and 2007-08,* a document published with this *e-brief* and available at http://www.cdhowe.org/pdf/signposts_2009.pdf .[6]

Table 1 lists the 11 schools in the province where the percentile rating in both the Primary Assessment and the Junior Assessment is 99 or higher, an exceptional achievement. The reasons for such an outstanding performance in both assessments at these schools should be investigated.[7] Finally, it is noteworthy that 10 of the 11 schools in Table 1 are in Catholic school boards. It is apparent from this result and other studies that Catholic boards are stronger than public boards.[8]

Who benefits from these ratings? Arguably, these ratings are most useful to school board administrators and education officials who wish to see which schools need improvement, and identify schools whose practices deserve imitation. Parents can also use them to evaluate whether their children's schools are doing a commendable job when compared to other schools in the province in similar socio-economic environments. If their school is in a high percentile then there is evidence that the principal, teachers and other staff at this school should be praised. On the other hand, if their school is in the 5th percentile or less, there is likely to be considerable room for improvement and a better performance is entirely possible.[9]

6 The file explains the construction and interpretation of the performance measures in more detail.

7 There are many other schools with high percentiles ratings in their respective assessment. These schools should be investigated and celebrated. Furthermore the choice to list 11 schools with both percentiles above 99 was arbitrary. It would be equally interesting to look at schools with percentiles above, say, 98 or 97. One unit differences in a percentile rating are not of any interest. It is the large gaps between the 90 percentile schools and the 10 percentile schools that are of the most interest.

8 Johnson (2008) found that Catholic boards produce systematically higher EQAO results than do public boards even when the social and economic background of students is taken into account.

9 A school's percentile is reported separately for Grade 3 and Grade 6 assessments. This is partly because some schools do not have Grade 6 assessment results and partly because a school could have a strong group of primary teachers leading to the primary assessment in Grade 3 and a weaker group teaching the children between Grade 3 and 6. A superb school would have high percentiles in both Grades 3 and 6.

Table 1: Eleven Schools in Top 99th Percentile or Higher in both Primary and Junior Assessments, 2005/06 – 2007/08 (in alphabetical order)

			Primary Division (Grade 3) Results					Junior Division (Grade 6) Results				
School Name	**School Board**	Total School Enrolment 2007-08	Number Assessed	Pass Rate	Adjusted Pass Rate	Predicted Adjusted Pass Rate	Percentile	Number Assessed	Pass Rate	Adjusted Pass Rate	Predicted Adjusted Pass Rate	Percentile
Blessed Margherita of Citta Castello Separate School	Toronto Catholic	273	78	89.4	24.7	-3.8	100	100	75.1	12.5	-8.4	99
Cornell Junior Public School	Toronto	883	332	79.8	15.1	-7.9	99	278	79.4	16.8	-4.9	99
John XXIII Separate School	Renfrew County Catholic	237	80	85.7	21.0	-4.0	99	85	73.9	11.3	-12.8	100
Monsignor O'Donoghue Catholic Elementary School	Peterborough Victoria Northumberland Catholic	346	93	92.0	27.3	0.2	100	139	80.4	17.8	-5.0	99
Our Lady of Charity Catholic Elementary School	Thunder Bay Catholic	274	118	75.8	11.1	-12.6	99	135	59.2	-3.4	-26.4	99
St Alfred Separate School	Niagara Catholic	411	134	78.0	13.3	-13.7	100	143	71.5	8.9	-11.2	99
St Francis de Sales Separate School	Catholic District School Board of Eatern Ontario	301	83	82.7	18.0	-11.5	100	119	69.1	6.6	-14.4	99
St John Bosco School	Niagara Catholic	266	66	81.4	16.7	-7.6	99	97	73.3	10.8	-12.4	99
St John Vianney Separate School	Simcoe Muskoka Catholic	261	85	84.6	19.9	-5.7	100	84	82.1	19.5	-12.2	100
St Martin of Tours Separate School	Hamilton-Wentworth Catholic	291	72	90.1	25.5	0.4	99	106	83.1	20.5	1.0	100
St Michael's Choir (Jr) School	Toronto Catholic	172	68	94.5	29.8	-2.5	100	88	94.2	31.6	1.0	100

Sources: Author's calculations; Statistics Canada; EQAO.

References

Johnson, David. 2005. *Signposts of Success – Interpreting Ontario's Elementary School Test Scores.* Toronto: C.D. Howe Institute.

Johnson, David. 2008. "Head of the Class: A Comparison of Ontario School Boards by Student Achievement." C.D. Howe Institute e-brief, August 27, 2008. http://www.cdhowe.org/pdf/ebrief_39.pdf

This *e-brief* is a publication of the C.D. Howe Institute.

David Johnson, Education Policy Scholar, C.D. Howe Institute and Professor of Economics, Wilfrid Laurier University.

For more information call David Johnson at 549-884-0710 or 416-865-1904.

This *e-brief* is available at www.cdhowe.org.