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Report Card on Québec's Secondary Schools

2003 Edition

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Contents

Introduction

The *Report Card on Québec's Secondary Schools: 2003 Edition* (hereafter, *Report Card*) collects a variety of relevant, objective indicators of school performance into one, easily accessible public document so that anyone can analyze and compare the performance of individual schools. By doing so, the *Report Card* assists parents when they choose a school for their children and encourages and assists all those seeking to improve their schools.

The *Report Card* helps parents choose

Where parents can choose among several schools for their children, the *Report Card* provides a valuable tool for making a decision. Because it makes comparisons easy, it alerts parents to those nearby schools that appear to have more effective academic programs. Parents can also determine whether schools of interest are improving over time. By first studying the *Report Card*, parents will be better prepared to ask relevant questions when they visit schools under consideration and speak with the staff.

Of course, the choice of a school should not be made solely on the basis of a single source of information. Web sites maintained by the provincial ministry of education and local school boards may also provide useful information.[1] Parents who already have a child enrolled at the school provide another point of view.

Naturally, a sound academic program should be complemented by effective programs in areas of school activity not measured by the *Report Card*. Nevertheless, the *Report Card* provides a detailed picture of each school that is not easily available elsewhere.

The *Report Card* facilitates school improvement

Certainly, the act of publicly rating and ranking schools attracts attention. This attention can provide both a carrot and a stick. The results of poorly performing schools generate concern, as do those of schools where performance is deteriorating. Schools that perform well or show consistent improvement are applauded. This inevitable attention provides an incentive for all those connected with a school to focus on student results.

However, the *Report Card* offers more than just incentive. It includes a variety of indicators, each of which reports results for an aspect of school performance that may be improved. School administrators who are dedicated to their students' academic success accept the *Report Card* as another source of opportunities for improvement.

Some schools do better than others

To improve a school, one must believe that improvement is achievable. This *Report Card*, like those published in other parts of Canada, provides evidence about what can be accomplished. It demonstrates clearly that, even when we take into account factors such as the students' family background—which some believe dictate the degree of academic success that students can enjoy in school—some schools do better than others. This finding confirms the results of research carried out in other countries.[2] Indeed, it will come as no great surprise to experienced parents and educators that the data consistently suggest that what goes on in the schools makes a difference to academic results and that some schools make a greater difference than others.

Comparisons are at the heart of the improvement process

By comparing a school's latest results with those of earlier years, we can see if the school is improving. By comparing a school's results with those of neighbouring schools or schools having similar school and student characteristics, we can identify more successful schools and learn from them. Reference to overall provincial results places an individual school's level of achievement in a broader context.

There is great benefit in identifying schools that are particularly effective. By studying the techniques used in schools where students are successful, less effective schools may find ways to improve. This advantage is not lost on the United Kingdom's Department of Education and Skills. Its Beacon Schools program[3] identifies schools across the country that have demonstrated expertise in a wide variety of challenging aspects of the management of schools and the teaching and counselling of their students.

Comparisons are at the heart of improvement: making comparisons among schools is made simpler and more meaningful by the *Report Card*'s indicators, ratings, and rankings.

You can contribute to the development of the *Report Card*

The *Report Card* program benefits from the input of interested parties. We welcome your suggestions, comments, and criticisms. Please contact us via e-mail to: reportcards@fraserinstitute.ca.

Notes

1   See, for instance, the Ministry of Education website at: http://www.meq.gouv.qc.ca/GR-PUB/m_englis.htm

2   See, for instance, Michael Rutter et al., *Fifteen Thousand Hours: Secondary Schools and Their Effects on Children* (Cambridge, MA: Harvard University Press, 1979); Peter Mortimore et al., *School Matters: The Junior Years* (Wells, Somerset: Open Books, 1988); and Laura Lein et al., *Successful Texas Schoolwide Programs: Research Study Results* (STAR Center at the Charles A. Dana Center, University of Texas at Austin). Digital document: http://www.starcenter.org/ products/ pdf/ successfulreport.pdf (as of May 5, 2003).

3   See the Beacon Schools program site at http://www.standards.dfee.gov.uk/beaconschools/ (as of May 5, 2003).

Key indicators of school performance

The foundation of the *Report Card* is an overall rating of each school's academic performance. In large part, we base our overall rating of each school's academic performance on the students' results in five core academic courses. They are Secondary V level courses in the language of instruction and second languages and Secondary IV level courses in History of Quebec and Canada, Physical Sciences, and Mathematics.[1] From these results we calculate the following indicators:

   (1) average uniform examination mark;

   (2) percentage of uniform examinations failed;

   (3) school level grade inflation;

   (4) difference between the examination results of male and female students in Secondary V level language of instruction and in Secondary IV level physical science, and;

   (5) a measure of the likelihood that students enrolled at the school will stay in school and complete their selected program of studies in a timely manner.

The first four indicators demonstrate the effectiveness of the school's efforts by measuring the extent to which it equips all its students with the knowledge and skills embodied in the curricula. The fifth indicator is an efficiency measure in that it demonstrates the extent to which the school is successful in keeping its students on task and devoted to the timely completion of their chosen secondary school program.

We have selected this set of indicators because they provide systematic insight into a school's performance.[2] Because they are based on annually generated data, we can assess not only each school's performance in a year but also its improvement or deterioration over time.

Indicators of effective teaching and counseling

1 Average uniform examination mark

For each school, for each year, under the heading *Résultats aux épreuves*, the table lists the average raw uniform examination mark achieved by its students at the June examination sitting in each of the five core courses. For the purposes of the calculation of the *Overall rating out of 10*, the average marks for all five courses are combined to produce an overall average mark.

Examinations are designed to achieve a distribution of results reflecting the inevitable differences in students' mastery of the course work. Differences among students in interests, abilities, motivation, and work-habits will, of course, have some impact upon the final results. However, there are recognizable differences from school to school within a district in the average results on the provincial uniform examinations. There is also variation within schools in the results obtained in different subject areas. Such differences in outcomes cannot be explained solely by the personal and family characteristics of the student body. It seems reasonable, therefore, to include these average uniform examination marks for each school as one indicator of effective teaching.

2 Promotion rate

During the secondary school years, students must make a number of decisions of considerable significance

about their education. They will choose the priority that they will assign to their studies. They will choose among optional courses. They will plan their post-secondary educational or career paths.

Will these young people make good decisions? It is unrealistic to presume that they can do so without advice, encouragement, and support. What practical, well-informed counselling can they call upon? While parents, in the main, are willing to help, many lack the information they need to be able to provide good advice. It falls, therefore, to the schools to shoulder some responsibility for advising students and their parents about these and other educational choices. Of course, wise students will seek guidance not only from the counsellors designated by the schools but also from teachers and administrators, parents and other relatives. Where students have strong support from family and community, the school's responsibility for counselling may be lighter; where students do not have such strong support, the school's role may be more challenging.

One of the most important decisions that students must make is to stay in school and complete their chosen programs of study in a timely manner. The *Promotion rate* (noted in the tables as *Taux de promotion)* measures the proportion of students in each school who do so. While there are factors not related to education—absence or emigration from the province, sickness, death, and the like—that can affect the data, there is no reason to expect these factors to influence particular schools systematically. Accordingly, we take variations in the *Promotion rate* to be an indicator of the extent to which students are being well coached in their educational choices. It is a composite result of two measures calculated from the experience of both the Secondary IV and Secondary V classes at the school.

The proportion of students who stay in school

The first component of the *Promotion rate* indicator gives credit to schools for the extent to which their students remain in school. While some students may

require more time to complete the general program than is normally the case and other students may transfer from the general program into a less rigorous program of study, at the minimum, we believe that schools should encourage and assist students to finish a program of secondary school study. This component was determined as follows. First, we calculated the proportion of the school's Secondary IV students who received a diploma or other qualification at the end of the school year or re-enrolled in any program in the following year. Then, we multiplied the result by the proportion of the school's Secondary V students who either received their diploma at the end of the school year or re-enrolled in any program in the following year.

The proportion of students who receive their general program diploma on time

The second component of the *Promotion rate* indicator provides a more rigorous test of the school's ability to ensure that its students stay on task. It was calculated by multiplying the proportion of the Secondary IV students at the school who either received a diploma or other qualification by the end of the year or were promoted to the Secondary V level by the proportion of the school's Secondary V students who obtained a diploma or other qualification in the same school year.

Note that neither of the two components used in the calculation of the *Promotion rate* indicator is a measure of the results of a single cohort of students.[3] Instead, we calculate the results for an "instant cohort" comprising the Secondary IV and Secondary V students enrolled at the school in the same year. Using a real student cohort, for example that of students who began Secondary IV in September of 2000 and were scheduled to receive their diplomas in June of 2002, would not measure the effectiveness of the individual school but that of the school system because the available data reports student certification and re-enrollment within the entire education system as a whole. Thus, students at one school in Secondary IV could receive their diploma at another school in the following years. Which school should

get credit for these students' timeliness? A further advantage of the "instant cohort" method of calculation is that it more accurately reflects the effectiveness of the school in a single school year by taking into account the results for students in both Secondary IV and Secondary V. Thus, the *Promotion rate* indicator is compatible with the other indicators used in the *Report Card*. The use of the "instant cohort" follows methodology developed by France's national ministry of education.[4]

Finally, we averaged these two components to calculate the composite *Promotion rate*.

3 School level grade inflation

For each school, this indicator (noted in the tables as *Surestimation par l'école*) measures the extent to which the average "school" mark—the accumulation of all the results from tests, essays, quizzes and so on given in class—exceeds the average uniform examination mark obtained in the five core courses. Where a school's average examination mark is higher than the average school mark, the school is assigned a zero on this indicator.

Effective teaching includes regular testing of students' knowledge so that they may be aware of their progress. As a systematic policy, inflation of school-awarded grades will be counterproductive. Students who believe they are already successful when they are not will be less likely to invest the extra effort needed to master the course material. In the end, they will be poorer for not having achieved the level of understanding that they could have achieved through additional study.

The effectiveness of school-based assessments can be determined by a comparison to external assessments of the students. The same authority—the Ministry of Education—that designed the courses administers the uniform final examinations. These examinations will test the students' knowledge of the material contained in the courses. If the marks assigned by the school reflect a level of achievement

that the student subsequently achieves or exceeds on the uniform examination, then the school has not deceived the student into believing that learning has occurred when it has not. It seems reasonable, therefore, to use this indicator as a third measure of effective teaching.

Indicators of equitable teaching

Effective schools will ensure that all their students are assisted and encouraged to reach their potential regardless of any real or perceived disadvantages resulting from personal or family characteristics. At such schools, teachers will take into account the characteristics of their students when they develop and execute their lesson plans. In doing so, they will reduce the probability that systematic differences in achievement are experienced by sub-populations within the student body.

1 Percentage of uniform examinations failed

For each school, this indicator (noted in the tables as *Échec*) provides the combined rate of failure (as a percentage) on the uniform examinations that form part of the five core courses. It was derived by dividing the sum, for each school, of the uniform examinations written by the students where a failing grade was awarded by the total number of such uniform examinations written by the students of that school.

In part, effective teaching can be measured by the ability of all the students to pass any uniform examination that is a requirement for successful completion of a course. Schools have the responsibility of preparing their students to pass these final examinations.

There is good reason to have confidence in this indicator as a measure of equitable teaching. First, these courses are very important to students regardless of their post-secondary plans. In order to obtain a general program diploma, students must successfully complete two of these courses (language of instruction at the Secondary V level and History of Québec

and Canada at the Secondary IV level). Anglophone students must also successfully complete French as a second language at the Secondary V level. The Secondary IV level Mathematics and Physical Science courses are a prerequisite for a variety of CEGEP courses. Second, since each of these courses has prerequisite courses, their successful completion also reflects how well students have been prepared in the lower grades. Since successful completion of the courses is critical for all students and requires demonstrated success in previous courses, it seems reasonable to use the percentage of uniform examinations failed as an indicator of the effectiveness of the school in meeting the needs of all its students.[5]

2   The Gender Gap indicators

In a study of gender differences in the academic results of British Columbian students, it was found that "there appears to be no compelling evidence that girls and boys should, given effective teaching and counselling, experience differential rates of success."[6] However, the data from Quebec's Ministry of Education upon which this study is based provides evidence that there are systematic differences in the results of these groups on the Ministry's uniform final examinations. For example, the results for the school year 2001/2002 reported in this *Report Card* show that at 91% of the schools' female students did better than male students on the Secondary V examinations in Language of instruction. In addition, at 57% of the schools, female students outscored their male classmates in the Secondary IV physical science examinations.

The indicators—Gender gap: language of instruction (in the tables, *Écarte sexes: langue maternelle*) and Gender gap: physical sciences (in the tables, *Écarte sexes: sciences physiques*)—are calculated by determining the difference between the two sexes on the average uniform examination results in each of the courses.[7]

Schools with a low gender gap are more successful than others in helping students of both genders to reach their potential.

In general, how is the school doing academically? The *Overall rating out of 10*

While each of the indicators is important, it is almost always the case that any school does better on some indicators than on others. So, just as a teacher must make a decision about a student's overall performance, we need an overall indicator of school performance. Just as teachers combine test scores, homework, and class participation to rate a student, we have combined all the indicators to produce an overall school rating, the *Overall rating out of 10*—in the tables, *Cote globale (sur 10)*.

To derive this rating, the results for each of the indicators, for each year, were first standardized. Standardization is a statistical procedure whereby sets of raw data with different characteristics are converted into sets of values with "standard" statistical properties. Standardized values can be combined and compared.

The standardized scores were then weighted and combined to produce an overall standardized score. Finally, this overall standardized score was converted into a score out of 10. (Explanatory notes on the calculation of the *Overall rating out of 10* are contained in Appendix 1.)

The *Overall rating out of 10* answers the question, "In general, how is the school doing, academically?" It is from this *Overall rating out of 10* that the school's provincial rank and its rank within the administrative region are determined.

Is the school improving academically? The Trends indicator

For all but the *Promotion rate* indicator, the *Report Card* provides seven years of data for most schools. Unlike a simple snapshot of one year's results, this historical record provides evidence of change (or lack thereof) over time. However, it can sometimes be dif-

ficult to determine whether a school's performance is improving or deteriorating simply by scanning several years of data. This is particularly the case in the measurement of examination results. In one year, a relatively easy uniform examination may produce a high average mark and a low failure rate. In the following year, the opposite may occur. It can, therefore, be difficult to tell whether an individual school's result is changing over time due to real change in school performance or due to differences in the make-up of the annual examination.

To detect trends in the performance indicators more easily, we developed a trends indicator. It uses regression analysis to identify those dimensions in which the standardized scores achieved by the school show a statistically significant change.[8] In such circumstances, it is likely that the school's results have actually changed relative to the results of other schools. Because trend calculation is very uncertain when only a small number of data points are available, trends are calculated only in those circumstances where at least five years of data are available.

Notes

1   The uniform examinations results that are presented and analyzed in the *Report Card* are: Language of Instruction, Secondary V level, English or French; Second language, Secondary V level, English or French; Physical sciences, Secondary IV level; Mathematics, Secondary IV level, and History of Quebec and Canada, Secondary IV level. The term "uniform examination" refers to those examinations set and administered by the Ministry of Education in courses that are required for certification of studies or that are pre-requisites for important post-secondary courses.

2   The student data from which the various indicators in this *Report Card* are derived is contained in databases maintained or controlled by the Government of Quebec, Ministry of Education.

3   It would have been useful to know the proportion of pupils progressing without delay through all five years of secondary school. However, a significant proportion of the schools in the *Report Card* offer only the last two years of secondary instruction. For this reason, it is impossible to use five-year promotion rates to compare all the schools in the *Report Card*. In any event, it is probable that drop-out rates are highest after most of the students have reached the age of 16 years, after which school attendance is not mandatory.

4   See http://193.51.6.240/ival/brochure.html. The French ministry uses the expression "fictitious cohort" to distinguish the group of students from a real cohort. We prefer the expression "instant cohort" because it expresses not only the fact that it differs from the real cohort but also that this concept is based on a single year's student results. If the main advantage of using the instant cohort is that it relates student promotion to the efforts of a single school in a single year, the disadvantage is that it disregards possible differences between the student groups—Secondary IV and Secondary V students—that make up the instant cohort. However, since we intend to report this *Promotion rate* annually, it will be possible to mitigate this problem through analysis of a time series of data.

5   Note that prior to 2000, the overall course failure rate was used in the calculation of this indicator. Subsequently, the failure rate on the uniform examinations was used. Thus, the indicator values for 2000 and 2001 cannot be directly compared with previous years' indicator values.

6   Peter Cowley and Stephen Easton, *Boys, Girls, and Grades: Academic Gender Balance in British Columbia's Secondary Schools* (Vancouver, BC: Fraser Institute, 1999).

7   Where both English and French language of instruction examinations were written at the school, the gender gap was calculated based on the results for the course in which the largest number of students were enrolled. The gender

gap for physical sciences was calculated using all the results at the school, regardless of the language in which the course was taught.

8   In this context, we have used the 90% confidence level to determine statistical significance.

Other indicators of school performance

Certainly, educators can and should take into account the abilities, interests, and backgrounds of their students when they design their lesson plans and deliver the curriculum. By doing so, they can minimize the effect of any disadvantages that their students may have. But, are all schools equally effective in enabling all students to succeed?

Three broad groups of factors—individual student characteristics, family or socio-economic characteristics, and school-related factors—are thought to play a part in the performance of students at school. To determine the impact of the school on its students, we must first remove the effect of student and family characteristics from the *Overall rating out of 10*. The remainder will be the school effect or "value added" by the school. With this new information, we will be able to identify those schools that appear to be making a greater contribution than others to their students' success.

The calculation of the *Value added* indicator (in the tables *Valeur ajoutée*) first requires that we assemble significant indicators of both non-school and school factors. In order to provide readers with more information about the school and its student body, the *Report Card* includes six contextual indicators, of which all but *EHDAA*[1] are used in the calculation of the value added by the school. They are as follows:

1 Late entry (noted in the tables as En retard) indicates the proportion of the students who are 16 years of age or older when they begin their Secondary IV year. This indicator gives us some insight into the personal characteristics of the school's students as they begin the last two years of their secondary school program. To a certain

degree, the indicator also allows us to isolate the effect of selective enrollments by some private and public schools.

2 *Average parents' employment income* (noted in the tables as *Revenus des parents*) indicates the average parental income from employment earned by the families of the school's students and is reflective of the student body's family background. This indicator was calculated using enrollment data provided by the ministry of education and income data from the 2001 census provided by Statistics Canada.

3 The total student enrollment (*Nombre d'élèves*) at the school.

4 The affiliation of the school, whether private or public. This is shown in the tables with indicator 5 (below) as part of the indicator *Secteur*.

5 The language of instruction at the school, whether French or English.

In order to construct a model of value added by the school, we first used by-postal-code enrollment data provided by the Ministry of Education and socio-economic data derived from the 2001 Census to establish a profile of the student body's family characteristics for each of the schools in the *Report Card*. We then used structural equation modeling[2]—a technique related to multiple regression analysis—to determine the nature of the relationship between these factors and the variations in school performance as measured by the *Overall rating out of 10*.[3] We added to this profile the average values for student characteristics (*Late entry*) and certain school characteristics (*student enrollment*, *school affiliation*, and *language of instruction*).

The association of student, family, and school factors with the *Overall rating out of 10*

A structural equation model, described in figure 1, was developed to determine the strength of the association between family, student, and school characteristics and the *Overall rating*. The model used values for the 423 schools for which we had sufficient data. The value accompanying each bold arrow describes the degree and direction of the relationship between the independent variable and the *Overall rating*. Possible values range from 0.0 indicating no relationship to 1.0 indicating a perfect relationship. A more detailed examination of the results of the analysis is presented in Appendix 2.

The student variable, *Late entry*, demonstrates the closest association with the *Overall rating*, followed by *school affiliation* and *language of instruction*. *Average parental employment income* and *total student enrollment* show less association in this model. Finally, the box in figure 1 enclosing a question mark reminds us that

there are likely a number of school-related factors—effectiveness of school leadership, teaching, and counseling, for instance—for which we do not have comparative data but that may be associated with the unexplained variation in the schools' overall rating.

The dashed arrows indicate possible indirect causal relationships. For example, in addition to its direct effect on the *Overall rating, Average parental employment income* may indirectly affect the *Overall rating* through its association with school choice. Higher parental income affords families a greater opportunity to select private schools that require payment of substantial tuition fees. Since private school affiliation has a direct positive relationship with the *Overall rating* independent of parental income, it is apparent that income has both a direct and an indirect effect on the *Overall rating*.

The analysis indicates that some 67%[4] of the variation among schools in the *Overall rating* is explained by this model.

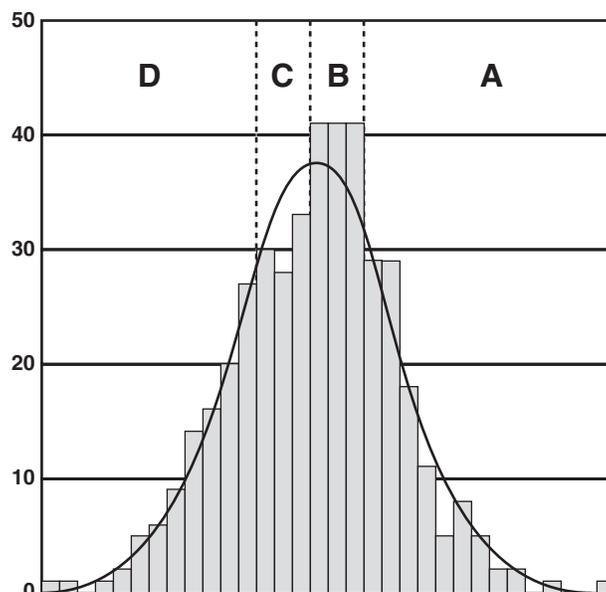**Figure 1.**

Estimating the value added by the school

Estimating the value added by the school is a two-part process. First, we confirm the association of a variety of factors with the *Overall rating out of 10* using the procedure described above. Then, from the linear equation that predicts the *Overall rating* based on the independent variables included in the model, we remove all the non-school factors. We thereby isolate the effect of the school.

Note that the residual, unexplained variance is assigned to the school. We do this for two reasons. First, our preliminary analysis of a wide range of socio-economic factors indicated that their combined effect was adequately approximated by average parental employment income alone. Second, as mentioned above, it is quite likely that many more school factors than those included in the model play an important role in the overall rating. Regrettably, we have not yet discovered any objective data that might capture the effect of such variables as strong school leadership or the establishment of high expectations at the school.

The product of this isolating procedure is a new rating for each school free of the influence of non-school factors. The schools were sorted based on this new rating and were assigned to quartiles based on the relative strength of this measure of school effect. Schools in the quartile with the highest school-effect values were assigned a score of A while the schools in the other three quartiles were assigned B, C, and D. The schools assigned a D are judged according to the model as having the least effect on the outcome of their students.

We adopted a letter grade for this *Value added* indicator rather than a numerical score to reflect the fact that our model can only estimate the effect of the school. Unlike the *Overall rating out of 10*, which is based on a combination of actual objective results, the *Value added* is the result of an imperfect model. While we believe that it quite accurately identifies the relative extent to which schools are having an effect on their students' results, it is unlikely that the model can

as yet be used to make fine distinctions between pairs of schools. Thus, until the model is significantly improved, we will assign only broad indicators of the *Value added* to each school.

Figure 2.

Note the characteristics of the distribution of the *Value added* measure in figure 2. This relatively normal distribution features a clustering of the B and C schools close to the average value. On the other hand, the A and D schools are spread over a considerably larger range of values. Given that the *Value added* is only an estimate, we should consider that only the A and D schools are of particular note. That is, the A schools are very likely above average in their effect on student results while the D schools are very likely below average. It is less likely that any distinctions can be made between the schools in the B and C quartiles other than to say that they are more or less average in terms of their effect on student results.[5]

It is also important to recognize that the *Value added* indicator reflects just one year's result. We know that the *Overall rating out of 10* can vary from year to year as the result of chance factors unrelated to the model described above. As this is the case, we would expect similar variation in the *Value added* from year to year. Over time, however, we will be able to identify

schools that routinely have a positive effect on their students' success.

School officials may be able to use the *Value added* indicator to identify schools that have had a relatively greater positive effect on their students. Thus identified, these schools can be used to establish norms of best practice that could be adopted by less successful schools to the benefit of their students.

Notes

1   "EHDAA" is the abbreviation for "Enfants handicapés ou en difficulté d'acquisition et d'apprentissage." EHDAA students have been assessed with any of a variety of physical, emotional, mental, or behavioural disadvantages and the public schools that they attend receive additional funds for use in the EHDAA students' education. Percentage *EHDAA (%)* is noted in the detailed tables as a measure of context within which to interpret the *Overall rating*. It was, however, excluded from the calculation of the *Value added* indicator for three reasons. First, because the student counts upon which the indicator reflect only ministry funded EHDAA students, they will vary with any changes to students' eligibility for funding. Thus, the indicator is unstable. Second, in most cases, private schools receive no extra funding for their EHDAA students and, as a result, no data is available on their EHDAA enrollment. Finally, EHDAA students are likely to be included in the *Late entry* counts that are available for all schools.

2   The analysis was carried out on the software, *EQS* version 5.7b. After a preliminary analysis of the results, we carried out transformations (logarithmic curve and square root) on four indicators *Average parents' employment income*, *Total student enrollment*, *Late entry*, and the *Overall rating* to reduce dissymmetry and to improve normality, linearity, and the homoscedasticity of the residual variances.

3   Several socio-economic indicators including average age of the parents, the number of years of schooling of the parents, parental employment income of employment, and parental government transfer income are strongly correlated. The precision of the analysis loses very little when only *Average parents' employment income* is used in the analysis. In addition, the interpretation of the results is considerably simplified.

4   In the first edition of the *Report Card*, we were able to account for roughly 39% of the variation among schools in the *Overall rating*. For that edition, we produced an indicator that corrected for family characteristics. Further analysis for the second edition allowed us to account for about 60% of the variation between schools. Our model now enables us to account for 67 % of the variance in the *Overall rating*, giving us considerable confidence in the model and in the stability of our estimate of value added.

5   Even so, a move over time from a grade of C to a grade of B may well be a sign of improvement.

Detailed school results

How to interpret the results

Use the sample table and the explanation of each line below to help you interpret the detailed results for individual schools. Families choosing a school for their students should seek to confirm the *Report Card*'s findings by visiting the school and interviewing teachers, school administrators, and other parents. More information regarding results at individual schools can be found on the Ministry of Education web site at: http://www.meq.gouv.qc.ca/EPPS-org.htm and on the web sites of local school boards and schools.

1 The name of the administrative area in which the school is located. This appears only above the first school listed in the administrative area.

2 The name of the school.

3 **Left:** The schools affiliation (public or private) and language of instruction (French or English).

4 **Left:** The number of students enrolled at the school in 2001/2002. Indicator results for small schools tend to be more variable than those for larger schools so caution should be used in interpreting the results for these schools.
Right: The school's academic rank in the province. In this example, the school is ranked 166th out of 455 schools in 2001/2002 and 157th

out of 424 schools for the five-year period, 1998 to 2002. These ranks indicate how the school is doing academically compared to all other schools of the province. A high ranking over five years indicates consistently strong results at the school. The rank is based on the *Overall rating out of 10*.

5 **Left:** Average employment income of the parents of students at the school. Higher parental income is sometimes associated with better student performance.
Right: The school's rank within its administrative region. In this example, the school was ranked second out of 11 schools in 2001/2002 and second out of 10 for the five-year period, 1998 to 2002. The regional rank indicates how the school is doing compared with other schools in the same administrative region. The rank is based on the *Overall rating out of 10*.

6 **Left, Late entry (%):** the proportion of students entering Secondary IV who are 16 years old or more. They are older than most students at this grade level. Late entry is an indication of the past academic achievement of the students as they enter the last two years of the secondary school program. A high rate of late entry students at the beginning of Secondary IV may partially explain lower student performance at the school. This

	RÉGION ADMINISTRATIVE: ABITIBI-TÉMISCAMINGUE								
1–									
2–	ÉCOLE SECONDAIRE LA CONCORDE								
3–	Secteur public francophone					2002		1998-2002	
4–	Nombre d'élèves: 328				Rang provincial: 163 / 455			157 / 424	–4
5–	Revenus des parents: nd				Rang régional:	1 / 11		2 / 10	–5
6–	En retard (%): 18,3				EHDAA (%): 30,4			Valeur ajoutée: nd	–6
	PERFORMANCE SCOLAIRE	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002 Tendances**	
	Résultats aux épreuves	(%)	(%)	(%)	(%)	(%)	(%)	(%)	
7–	Langue maternelle	69,8	68,8	60,0	73,7	72,6	63,2	80,5 —	
8–	Langue seconde	71,8	71,7	78,5	76,3	80,2	80,5	87,7 ▲	
9–	Histoire	73,4	71,7	83,1	76,7	78,8	81,2	72,9 —	
10–	Sciences physiques	71,5	65,0	75,9	72,1	81,5	77,8	72,9 —	
11–	Mathématiques	nd	nd	nd	nd	nd	72,1	64,9 nd	
12–	Échec (%)	13,8	18,9	16,9	8,5	6,3	14,6	9,4 —	
13–	Surestimation par l'école (%)	4,3	2,5	2,9	0,2	0,0	2,2	1,6 —	
14–	Écart sexes (%): Langue mat.	F 1,5	F 3,8	F 10,0	F 7,0	F 8,9	F 6,3	F 7,7 —	
15–	Sciences phy.	nd	nd	F 1,6	M 4,7	M 2,6	F 6,9	M 3,7 —	
16–	Taux de promotion (%)	nd	nd	nd	nd	nd	nd	64,4 nd	
17–	**COTE GLOBALE (SUR 10)**	**5,7**	**5,3**	**6,1**	**6,9**	**6,6**	**6,5**	**6,7 —**	

school's proportion of 31.8% late entry students is higher than the average.

Centre, EHDAA (%): Special needs (EHDAA) enrollment indicates the proportion of pupils in Secondary IV and Secondary V who are considered disabled or who have certain specific learning and/or behaviour difficulties and for whom public school districts receive additional funding. Since private schools do not generally receive funding for EHDAA students, most will not have EHDAA percentages. A high rate of EHDAA may partially explain lower school performance.

Right, Value added: This is an estimate of the school's contribution to its *Overall rating out of 10*. Schools that have a strong, positive impact on their students receive an A for this indicator. Those that have little impact receive a D. Schools that receive a B or a C may have some positive impact on their students.

7–11 Average exam marks: The average marks obtained by the school's students on each of five uniform examinations. Exams in Language of instruction and Second language courses are administered in Secondary V. Exams in History, Physical Sciences, and Mathematics are administered in Secondary IV.

12 Fail rate: The proportion of these uniform exams written by the students that received a failing grade.

13 Grade inflation by the school: The amount in percentage points by which the students' average school marks in all of the five courses exceed the average marks obtained by the students on the uniform exams. Schools with a higher value on this indicator may be inflating the school marks.

14 and 15: Gender gaps: The percentage points by which the average uniform exam marks in Language of instruction and Physical sciences favour either male or female students. When female students are more successful, an **F** precedes the value; when male students are more successful, an **M** precedes the value.

16 Promotion rate: This indicator takes into account the proportion of Secondary IV and

Secondary V enrolled at the school that either (a) receive a diploma or other qualifications at the end of the year or, (b) return to school in the following year for further study. Schools with high values on this indicator have done a good job of ensuring that their students remain in school in order to complete their program of studies in a timely manner.

17 Overall rating (out of 10): The Overall rating takes into account all of the school performance indicators, in order to answer the question, "In general, how is the school doing academically?"

Trends: Trends show any statistically significant change in the school's performance on the indicators and the *Overall rating out of 10*. Trends are only determined where at least five years of data are available. If school performance is improving, an upward pointing arrow (▲) will appear. If the school's performance is deteriorating, a downward pointing arrow (▼) will appear. Where a dash (—) appears, no statistically significant trend is discernable.

Other notes

Note 1

Not all of Quebec's secondary schools are included in the tables or the ranking. Excluded are schools with less than 15 students enrolled in Secondary V and other schools that did not generate a sufficiently large set of student data to enable the calculation of an *Overall rating out of 10*. Also excluded from the *Report Card* are centers of adult education and continuing education, schools that enroll a significant number of non-resident foreign students, and certain alternative schools that do not offer a full program of studies.

The exclusion of a school from the Report Card should in no way be considered to be a judgement of the school's effectiveness.

Note 2

In order to take advantage of improvements in methods and the design of the indicators while ensuring

the comparability of year-to-year results, the historical values have been recalculated. For this reason, the historical results for some schools may vary slightly from those published in previous editions of the *Report Card.*

Note 3

When the available data are insufficient for the calculation of an indicator or when a school did not function during a certain year, "nd" appears in the tables.

Note 4

You can compare the results of a school with these all-schools average results.

Where to find the detailed tables

The tables showing the detailed results for the schools will be found on pages 25 to 70 of the French version of this study, *Bulletin des écoles secondaires du Québec Édition 2003.*

ALL SCHOOLS AVERAGES										
EHDAA (%): 6,6				Nombre d'élèves: 791						
Revenus des parents: 55 840 $				En retard (%): 26,4						
PERFORMANCE SCOLAIRE	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**Tendances**
Résultats aux épreuves (%)										
Langue maternelle	72,1	71,5	73,2	75,7	69,0	74,7	75,4	73,7	71,3	—
Langue seconde	77,4	76,4	77,3	76,9	81,1	79,7	80,4	78,7	79,8	—
Histoire	68,4	70,2	68,4	66,2	75,2	70,3	67,6	71,0	66,7	—
Sciences physiques	48,8	62,0	64,3	61,8	73,5	69,1	75,0	72,9	75,1	—
Mathématique	nd	nd	nd	nd	nd	nd	nd	64,3	68,9	nd
Échec (%)	18,2	18,2	15,8	15,6	14,4	15,2	13,6	17,1	17,3	—
Surestimation par l'école (%)	3,0	1,9	1,9	2,7	1,6	2,4	1,9	2,4	2,7	—
Écart sexes (%): Langue mat.*	5,2	4,8	4,9	4,7	5,4	4,9	5,0	5,0	4,6	_
Sciences phy.*	3,2	2,9	3,4	2,8	3,1	3,0	3,0	3,0	2,8	_
Taux de promotion (%)	nd	nd	nd	nd	nd	nd	nd	nd	79,1	nd
COTE GLOBALE (SUR 10)	**6,2**	**6,2**	**6,2**	**6,2**	**6,2**	**6,2**	**6,2**	**6,2**	**6,2**	**—**

* These results reflect the average size of the gender gaps. The langue maternelle gender gap favoured females at 90.9% of schools, males at 8.4% of schools, and were even at 0.8% of schools. The sciences physiques gender gap favoured females at 57.2% of schools, males at 41.5% of schools, and were even at 1.3% schools.

Ranking the schools

Important notes to the rankings

In this table, schools are ranked (on the left hand side of the page) in descending order (from 1 to 453) according to their academic performance as measured by the *Overall rating out of 10* (shown on the right hand side of the table) for the school year 2001/2002. Each school's average ranking over the last five years and average *Overall rating out of 10* over the last five years are also listed. The higher the *Overall rating out of 10*, the higher the rank awarded to the school. Where schools tied in the *Overall rating*, they were awarded the same rank. Where insufficient data were available to calculate a rating, "nd" appears in the table.

Not all of Quebec's secondary schools are included in the tables or the ranking. Excluded are schools with less than 15 students enrolled in Secondary V and other schools that did not generate a sufficiently large set of student data to enable the calculation of an *Overall rating out of 10*. Also excluded from the *Report Card* are centers of adult education and continuing education, schools that enroll a significant number of non-resident foreign students, and certain alternative schools that do not offer a full program of studies.

The exclusion of a school from the Report Card should in no way be considered to be a judgement of the school's effectiveness.

Where to find the ranking table

The table showing the ranking of the schools will be found on pages 71 to 80 of the French version of this study, *Bulletin des écoles secondaire du Québec Édition 2003*.

Schools that contribute greatly to their students' success

In this table, we list the 106 schools that received the highest possible rating for value added. The value added mark is based on results for the school year 2001/2002.

The table will be found on pages 81 to 82 of the French version of this study: *Bulletin des écoles secondaires du Québec: Édition 2003*.

Appendix 1: Calculating the Overall rating out of 10

The *Overall rating out of 10* is intended to answer the question, "In general, how is the school doing, academically?" In order to answer this question a number of aggregations of a variety of data sets, many with dissimilar distributions, must be accomplished. Further, since the *Overall rating out of 10* is a key indicator of improvement over time, the method of its derivation must take into account that even the annual values within a given data set may not share statistical characteristics. For example, the mean and standard deviation of the distribution of average examination marks across schools in language of instruction studies may vary between English and French and within either subject from year to year. Thus, the need for aggregation of dissimilar data and for year-over-year comparability of data within data sets dictated the use of standardized data for the calculation of the *Overall rating out of 10*.

The following is a simplified description of the procedure used to convert each year's raw indicator data provided by the Ministry of Education into the *Overall rating out of 10* contained in the detailed tables.

1   Results in the English and French versions of Secondary IV level History were aggregated to produce a weighted average examination mark, fail rate, and school level grade inflation rate without standardizing. We did not standardize prior to weight averaging because we have no reason to believe that the French and English versions of the same examination are dissimilar. The two versions of Secondary IV level Mathematics and Physical Science were aggregated in the same way. In both cases, student enrollment proportions were used as the weighting factor.

2   All the results were then standardized by solving the equation

$$Z = (X - \mu) / \sigma$$

where X is the individual school's mean result; μ is the mean of the all-schools distribution of results and σ is the standard deviation of the same all-schools distribution.

3   Since the Secondary V level French as a second language and Secondary V level English as second language courses each have several distinct components that are separately examined, for each course the results for these components were first standardized and then aggregated with equal weightings to produce an overall standardized result for the course. These results were then re-standardized.

4   All the aggregated standardized results as well as the two language of instruction results (these two distinct data sets did not need to be aggregated prior to the calculation of the overall results) were then aggregated to produce overall weighted average examination mark, fail rate, school level grade inflation, language of instruction gender gap and physical science gender gap indicators. These weighted average overall results were again re-standardized.

5 The five overall standardized results described in 4 above were then combined with the standardized *Promotion rate* to produce a weighted average summary standardized score for the school. For the school year 2000/2001, the *Perseverance rate* was used as the sixth indicator; for 1999/2000, an indicator similar to the *Promotion rate* was used; and, for all prior school years only the five indicators in 4 above were used to calculate the *Overall rating out of 10*. The weightings used in these calculations were as follows: *Examination marks*—40%, *Fail rate*—20%, *School level grade inflation*—10%, *combined gender gap indicators*—10%, and *Perseverance rate*—20%. Where fewer than two gender gap indicators could be calculated, the weightings used were as follows: *Examination marks*—45%, *Fail rate*—22%, *School level grade inflation*—11%, and *Perseverance rate*—22%.

6 This summary standardized score was standardized.

This standardized score was converted into an overall rating between zero and 10 as follows:

7 The maximum and minimum standardized scores were set at 2.0 and –3.29 respectively. Scores equal to, or greater than, 2.0 will receive the maximum overall rating of 10. This cut-off was chosen because the occasional, although infrequent, occurrence of scores above 2.0 (two standard deviations above the mean) allows the possibility that more than one school in a given year can be awarded a "10 out of 10." Scores equal to, or less than, –3.29 will receive the minimum overall rating of 0. Schools with scores below –3.29 are likely outliers—a statistical term used to denote members of a population that appear to have characteristics substantially different from the rest of the population. We therefore chose to set the minimum score so as to disregard such extreme differences.

8 The resulting standardized scores were converted into overall ratings according to the formula

$$OR = \mu + (\sigma * StanScore)$$

where OR is the resulting Overall rating; μ is the average calculated according to the formula

$$\mu = (OR_{min} - 10 (Z_{min} / Z_{max})) / (1 - (Z_{min} / Z_{max})); \sigma = (10 - \mu) / Z_{max}$$

and StanScore is the standardized score calculated in (6) above and adjusted as required for minimum and maximum values as noted in (7) above. Also, as noted in (7) above, $OR_{min} = 0$, $Z_{min} = -3.29$, and $Z_{max} = 2.0$.

9 Finally, the derived Overall rating is rounded to one place of the decimal to reflect the significant number of places of the decimal in the original raw data.

Note that the *Overall rating out of 10*, based as it is on standardized scores, is a relative rating. That is, in order for a school to show improvement in its overall rating, it must improve more than the average. If it improves, but at a rate less than the average, it will show a decline in its rating.

Appendix 2: Parameters used for the estimation of valued added by the school

Table 1 reports the coefficients of regression, B (unstandardized) and β (standardized), resulting from the structural equation model used to define the *Value added* indicator. The analysis was carried out using EQS version 5.7b software.

After a preliminary analysis of the results, transformations of four variables were adopted in order to reduce dissymmetry and to improve the normality, linearity, and homoscedasticity of the residual variances. A logarithmic transform (*Ln*) was calculated for *PARENT INCOME*, and square root transforms (*SQRT*) were calculated for *STUDENT ENROLLMENT*, *LATE ENTRY* and *OVERALL RATING*.

The analysis produces three fit indices, NFI, NNFI, and CFI that indicate the extent to which the model can predict the variances of all of the variables in the model. High values of these indices such as those reported in table 1 above are an indication that the model fits the data well. In addition to the regression coefficients B and β, the table presents the correlation coefficient, average, and standard deviation of each of the independent variables. The R^2 statistic of 0.67 equals that obtained last year. The consistency of result suggests an appreciable robustness in the explanatory model given that membership in the school cohort has changed somewhat and that this year's calculations were based on recently received 2001 census data.

The *Value added* indicator is derived by solving the following equation:

Value added = (SQRT *Overall rating* – (0.35 * *Ln Parent Income* –0.14 * SQRT *Late Entry*))

The schools were sorted in descending order according to their *Value added*. Then, a letter grade of A was assigned to those schools in the highest scoring quartile, B to the schools in the next quartile, C to the schools of the third highest scoring quartile, and finally, D to the schools of the remaining quartile.

Table 1. Structural equations model of factors directly effecting the Overall rating out of ten, calculated using the maximum probability method.

Variables	SQRT OVERALL RATING*	Ln PARENT INCOME	SQRT LATE ENTRY	SQRT STUDENT ENROLLMENT	LANGUAGE OF INSTRUCTION	B	β
Ln PARENT INCOME	.51					.35	.12
SQRT LATE ENTRY	-.77	-.53				-.14	-.58
SQRT STUDENT ENROLLMENT	.08	.05	-.01			.00	.09
LANGUAGE OF INSTRUCTION	.60	.44	-.55	-.31		.27	.26
SCHOOL AFFILIATION	.09	-.22	.10	.35	-.01	.16	.15
Averages	2.15	4.72	4.86	27.10	.23		
Standard deviations	.44	.14	1.82	9.43	.42		$R^2=0.67$
N = 423**	Model of independence, χ^2: 973.04; dl : 15 χ^2 : 51.15 dl : 2				NFI : 0.95; NNFI : 0.62; CFI : 0.95 RMSEA : 0.24		

* The sign of the square root of the Overall rating was reversed to take into account the characteristics of the distribution.

** Complete contextual data were available for only 423 of the 455 rated schools. However, we were able to calculate the value added indicator for 427 schools because the final calculation required values for only three variables.

About the authors and Acknowledgments

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