

MAY 2002

# Report Card on Alberta's High Schools

## 2002 Edition

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Editing and design: Kristin McCahon and Lindsey Thomas Martin

Printed and bound in Canada.

ISSN 1492-1863.

Date of issue: May 2002



# Introduction

The *Report Card on Alberta's High Schools: 2002 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 can help 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, the *Report Card* alerts parents to those nearby schools that appear to have more effective academic programs. Parents can also determine whether or not schools of interest are improving over time. By first studying the *Report Card*, parents will be better prepared to ask relevant questions when they interview the principal and teachers at the schools under consideration.

Of course, the choice of a school should not be made solely on the basis of any one source of information. Families choosing a school for their students should seek to confirm the *Report Card's* findings by visiting the school and interviewing teachers and school administrators. And, 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 and those whose performance is deteriorating generate concern. Schools that perform well or show consistent improvement are applauded. The inevitable attention, in itself, provides an incentive for all those connected with a school to redouble their efforts to improve student results.

However, the *Report Card* offers more than just incentive. The *Report Card* includes a variety of indicators, each of which reports results for an aspect of school performance that might be improved. School administrators who are dedicated to improvement eagerly accept the *Report Card* as another source of evidence that their schools can do a better job.

## **Some schools do better than others**

In order to embrace improvement goals, one must believe that they are achievable. The *Report Card on Alberta's High Schools*, like all the other editions, 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 will have in school, some schools do better than others. This finding confirms research results from other countries.<sup>1</sup> 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 student success and that some schools make more of a difference than others.

### Comparisons are at the heart of the improvement process

Many school authorities in Alberta use student report cards that include both the student's result and the median mark for each subject in which the student is enrolled. The report cards also show any marks awarded to the student earlier in the year. Historical and relative data like this enable students and parents to see a clearer picture of the individual student's progress. 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 of schools with 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 proven 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 Employment. Its Beacon Schools<sup>2</sup> program 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 and making comparisons among schools is made simpler and more meaningful by the *Report Card's* indicators, ratings, and rankings.

### What improvements are planned for future editions of the *Report Card*?

How well do schools help students complete their studies in a timely manner?

#### The *Transition Rate* indicator

We have developed the *Transition Rate* indicator to measure the extent to which schools keep their students in school and on task. It uses data that report the educational status of students one year after they enrolled in a given grade at an Alberta school. For example, from these data we can determine how many of a school's grade 10 students re-enroll in grade 11 the following year; are enrolled in grade 10 for a second time; or fail to re-enroll. With these raw data for each grade level, following a technique first used by France's national ministry of education, we can calculate a statistic that will answer the question, "Based on this year's school results, what is the likelihood that a student will graduate from this school in the normal time?"<sup>3</sup>

#### Measuring the value added by the school: The Achievement Testing Program

The Achievement Testing program is an annual measurement of students' ability in language arts, mathematics, and other subjects at grades 3, 6, and 9. It is our intention to use the grade 9 results as benchmarks against which to compare each school's results on grade 12 examinations. By doing so, we hope to establish a measure of the value added by the school during grades 10 through 12. We are now accumulating data that will enable us to introduce this measure in the 2004 edition of the *Report Card*.

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

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



# A measure of academic effectiveness for schools

The foundation of the *Report Card* is an overall rating of each school's academic performance. Building on data about student results provided by Alberta Learning (the provincial ministry of education) we rate each school on a scale from zero to 10. We base our overall rating of each school's academic performance on seven indicators:

- (1) average diploma examination mark;
- (2) percentage of diploma examinations failed;
- (3) difference between the school mark and examination mark in diploma courses;
- (4) difference between male and female students in the value of indicator (3) for English 30;
- (5) difference between male and female students in the value of indicator (3) for Pure Mathematics 30;
- (6) diploma courses taken per student;
- (7) diploma completion rate.

We have selected this set of indicators because they provide systematic insight into a school's performance. 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.

## Three indicators of effective teaching

### 1 Average diploma examination mark

This indicator (in the tables *Average exam mark*) is the average percentage achieved by a school's regular day students on the uniform final exami-

nations in all of the diploma courses.<sup>4</sup> For each school, the indicator is the average of the mean scores achieved by the school's students in each of the diploma examinations at all sittings during the year, weighted by the relative number of students who completed the course.

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

### 2 Percentage of diploma examinations failed

For each school, this indicator (in the tables *Percentage of exams failed*) provides the rate of failure (as a percentage) in the diploma examinations. It was derived by dividing the sum, for each school, of all diploma examinations written by regular day students where a failing grade was awarded by the total number of such examinations written by those students. In part, effective teaching can be measured by the ability of 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 effective teaching. A student need only successfully complete two diploma courses in order to graduate. Such a student's course of study may not include the prerequisites for all post-secondary educational options but it will be sufficient for graduation from high school. Thus, students enroll in the diploma courses, in large measure, because they want to take them. Further, their success in grade 12 reflects to a certain extent how well students have been prepared in the lower grades. All of the diploma courses have prerequisite courses. Indeed, depending on the school, admission to some of the grade 12 courses may require that the student have received a prescribed minimum grade in the prerequisite lower-level course. Since the decision to take diploma courses is, for the most part, voluntary and requires demonstrated success in previous courses, it seems reasonable to use the percentage of examinations failed in these courses as an additional indicator of the effectiveness of the teaching in high schools.

### 3 Difference between school mark and examination mark

For each school, this indicator (in the tables *School vs exam mark*) gives the average of the absolute value of the difference between the average mark obtained on the diploma examinations and the average "school" mark—the accumulation of all the results from tests, essays, quizzes, and so on given in class—for all the diploma courses.<sup>5</sup>

Effective teaching includes regular testing so that students may be aware of their progress. For such assessment to be useful, it must reflect the student's understanding of the course accurately. As a systematic policy, inflation of the grades awarded by the school 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 gained through additional study. On the other hand, the systematic deflation of grades can work to the detriment of students in those situations where post-secondary admissions and scholarship awards are, in part, based on school assessments. Students may also lose interest in a subject when their actual understanding of the material is disparaged by inadequate recognition.

The effectiveness of school-based assessments can be determined by a comparison to external assessments of the students. For each diploma course, Alberta Learning, the authority that designed the course, administers its uniform examination. This examination will test the students' knowledge of the material contained in the course. If the mark assigned by the school is a reasonably accurate reflection of students' understanding, it should be roughly the same as the mark gained on the diploma examination. Thus, if a school has accurately assessed a student as consistently working at a C+ level, the student's examination result will be at a similar level. If, however, a school is consistently granting marks substantially higher or lower than those achieved by its students on the final examinations, then the school is not providing an accurate indicator of the extent to which knowledge of the course material is being acquired.

### An indication of consistency in teaching and assessment

#### The *Gender gap* indicators

Research<sup>6</sup> has shown that, in British Columbia's secondary schools, there are systematic differences between the academic results achieved by boys and those achieved by girls. These differences are particularly apparent where the local school makes the assessments. These findings are supported by data from Alberta Learning. However, the same research found that "there appears to be no compelling evidence that girls and boys should, given effective teaching and counselling,

experience differential rates of success.”<sup>7</sup> Further, “[t]he differences described by each indicator vary from school to school over a considerable range of values.”<sup>8</sup>

The *Gender gap* indicators measure the difference, if any, in the average school marks in Pure Mathematics 30<sup>9</sup> and English 30 for boys and girls when their respective average examination marks in the same courses are taken into account. For each course, the indicator value is determined according to the formula:

$$\begin{aligned} & (\text{Female school mark} - \text{Female exam mark}) \\ & - (\text{Male school mark} - \text{Male exam mark}) \end{aligned}$$

The indicator reports the size of the difference and the more successful sex.

The *Gender gap* indicators are affected by at least two factors. If the components of the curriculum tested at the school level are different from those tested on the diploma examination, a high gender gap indicates that the favoured sex is, on average, more successful in acquiring the skills and knowledge embodied in those aspects of the curriculum tested at the school level. If the components of the curriculum tested at the school level are the same as those tested on the diploma examination, then a high gender gap indicates that the school-based assessment may be biased in favour of one sex or may include factors in the assessment other than understanding of the curriculum. In either case, schools experiencing high gender gaps should investigate classroom practice to determine why one sex receives better grades than the other.

### **Two indicators of practical, well-informed counselling**

While they are attending high school, students must make a number of decisions of considerable significance about their education. They will, for instance, annually decide whether to begin or continue learning a second language. In grade

10, they are required to choose between different streams in several core subject areas. In grade 12, they may face the choice of completing high school or abandoning it in favour of full-time work.

Will these young people make good decisions? It is unrealistic to presume that they can do so without advice. 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 educational choices.

The final two indicators used in the calculation of the *Overall rating out of 10* assess the counsel given by the schools by measuring the quality of the decisions taken by the students about their education. 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. These indicators measure the school’s success in using the tools at its disposal to help students make good decisions about their education.

There are two very important decisions that senior students must make. First, they must decide whether or not to take a number of academically challenging diploma courses. Second, having made it through school to the end of September in grade 12, they must decide whether to stick it out, do the work, and graduate with their class. Effective counselling will encourage students to make appropriate choices.

#### **1 Diploma courses taken per student**

This indicator (in the tables *Courses taken per student*) measures the average number of diploma courses completed by those students at the school who completed their third year of high school

during the reported year. It is derived by summing each school's diploma course participation rates provided by Alberta Learning.

In their senior years, students have freedom to choose from a considerable variety of courses. Their choices will have an impact upon their literacy, numeracy, and analytical skills upon graduation. Their choices also affect the post-secondary options open to them.

Diploma courses offer study at the senior level in a variety of core disciplines: English language arts (or French for francophone students), Mathematics, the sciences, and the humanities. Alberta Learning has developed courses in each discipline that reflect the post-secondary ambitions of different groups of students and, far from being courses only for a university-bound elite, these courses teach skills and knowledge that will benefit students no matter what they plan to do after graduation. Further, it is the marks obtained in these courses that are commonly used by post-secondary institutions—institutes of technology and community colleges as well as universities—to assess the applicant's readiness for further study and for admission to programs with limited enrollment. Thus, for most students a decision to take advantage of these courses is a good one and a school that is successful in encouraging students to take these courses shows that it offers practical, well-informed counselling.

## 2 Diploma completion rate

This indicator reports the percentage of first-time grade 12 students who received a diploma in the reported school year. It is derived from data provided by Alberta Learning.

Graduation from high school retains considerable value since it increases options for post-secondary education. Further, graduates from high school who decide to enter the work force immediately will, on average, find more job opportunities than those who have not graduated.

By completing the 11 years of schooling in preparation for the final high-school year, stu-

dents have already demonstrated a reasonable ability to handle the basic courses offered by the school. Moreover, for the majority of students, the minimum requirements for graduation are not onerous. The chance that students will not graduate solely because they are unable to meet the intellectual demands of the curriculum is, therefore, relatively small.

Nevertheless, the graduation rate varies quite widely from school to school throughout the province. While there are factors not related to education—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 graduation rate to be an indicator of the extent to which students are being well coached in their educational choices.

### **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 (in the tables *Overall rating out of 10*). 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 of school performance answers the question, "In general, how is the school doing, academically?"

To derive this rating, the results for each of the indicators, for each of the six years 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 readily be combined and compared.



The standardized data were then combined as required to produce seven standardized scores—one for each indicator—for each school, for each year. The seven standardized scores were weighted and combined to produce an overall standardized score. Finally, this score was converted into an overall rating out of 10. It is from this *Overall rating out of 10* that the school's provincial rank is determined.

For schools where only boys or girls were enrolled, there are, of course, no results for the *Gender gap* indicators. In these cases the *Overall rating* is derived using the remaining five indicators. Because no diploma completion data were available for the year 1995/1996, the overall rating was calculated using the remaining six indicators. (See Appendix 1 for an explanation of the calculation of the *Overall rating out of 10*.)



# Other indicators of school performance

Since the first edition of the *Report Card*, we have added other indicators that, while they are not used to derive the *Overall rating out of 10*, add more information on the school's effectiveness.

## The *Trend* indicator

Is the school improving academically? The *Report Card* provides six 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.

In order to detect trends in the performance indicators, we developed the *Trend* indicator. This indicator uses statistical analysis to identify those dimensions of school performance in which there has been real change rather than a fluctuation in results caused by random occurrences. To calculate the trends, the standardized scores rather than raw data are used. Standardizing makes historical data more comparable and the trend measurement more reliable. Because calculation of trends is uncertain when only a small number of data points is available, a trend is indicated only in those circumstances where six years of data are available and where it is determined to be statistically significant. For this indicator we have defined the term "statistically significant" to mean that, nine times out of 10, the trend that is noted is real, that is, it did not happen just by chance.

## The socio-economic indicator

To what extent do socio-economic factors affect the school's *Overall rating out of 10*? Educators can and should take into account the abilities, interests, and backgrounds of their students when they design lesson plans and teach the curriculum. By

doing so, they can overcome disadvantages that their students may have. The socio-economic indicator enables us to identify schools that are roughly similar to each other with respect to the home background of their students so that their results can be compared. The effective school will produce good results regardless of the family background of its students.

The socio-economic indicator was derived as follows. First, using Alberta Learning enrollment data sorted by census enumeration area and socio-economic data provided by Statistics Canada,<sup>10</sup> we established a profile of the student body's home characteristics for each of the schools in the *Report Card*. We then used multiple regression—a tool used in statistical analysis—to determine which of the home characteristics were associated with variations in school performance as measured by the *Overall rating out of 10*.

Taking into account all of these variables simultaneously, we identified one characteristic that possessed a statistically significant association with the *Overall rating*: the average number of years of education of the most educated parent in a two-parent family (or of the lone parent in a single-parent family). When a school had children whose parents are more highly educated, the overall rating at the school was likely to be higher. We have adopted this statistic—noted in the tables as *Parents' average education (yrs)*—as the socio-economic indicator for this edition of the *Report Card*.

This measure of the socio-economic background of a school's student body is presented with two important notes of caution. First, when all the schools in the *Report Card* are considered,

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only about 17% of the variation between schools in the *Overall rating* is associated with the socio-economic factors studied. Clearly, many other factors—including good teaching, counselling, and school administration—contribute to the effectiveness of schools. Second, these statistical measures describe past relationships between a socio-economic characteristic and a measure of school

effectiveness. It should not be inferred that these relationships will or should remain static. The more effectively schools enable all their students to succeed, the weaker will be the relationship between the home characteristics of students and their academic success. Thus, this socio-economic indicator should not be used as an excuse or rationale for poor school performance.



# Notes

- 1 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 Joseph F. Johnson, Jr., *Case Studies from the National Study of High-Performing, High-Poverty Schools*, digital document: <http://www.starcenter.org/priority/casestudies.htm> (April 11, 2000) (STAR Center at the Charles A. Dana Center, University of Texas at Austin).
- 2 See the Beacon Schools program site at <http://www.standards.dfee.gov.uk/beaconschools/>.
- 3 A detailed discussion of the *Transition Rate* indicator will be found on page 8 of Richard Marceau and Peter Cowley, *Bulletin des écoles secondaires du Québec : Édition 2001 / Report Card on Quebec's Secondary Schools: 2001 Edition* (Montréal and Vancouver: Institut économique de Montréal and The Fraser Institute, 2001), where it is called *Promotion rate* or *Taux de promotion*. We plan to include the *Transition Rate* indicator in next year's edition of the *Report Card on Alberta's High Schools*. In the meantime, we welcome enquiries from any who would like to discuss the indicator in more detail and provide us with comments or criticism. Please direct all such correspondence by e-mail to: [reportcards@fraserinstitute.ca](mailto:reportcards@fraserinstitute.ca).
- 4 The following diploma courses were offered for at least some of the years between 1995/1996 and 2000/2001: Applied Mathematics 30, Biology 30, Chemistry 30, English Language Arts 30, English Language Arts 33, Français 30, Mathematics 33, Physics 30, Pure Mathematics 30, Science 30, Social Studies 30, Social Studies 33. Students enrolled in francophone programs may write the examinations for many of these courses in French.
- 5 For purposes of the calculation of the final mark, the school-awarded mark and the diploma examination mark each count for 50%.
- 6 Peter Cowley and Stephen Easton, *Boys, Girls, and Grades: Academic Gender Balance in British Columbia's Secondary Schools*, Public Policy Sources 22 (Vancouver, BC: The Fraser Institute, 1999).
- 7 Cowley and Easton, *Boys, Girls, and Grades*: page 7.
- 8 Cowley and Easton, *Boys, Girls, and Grades*: page 17.
- 9 Prior to the school year 2000/2001, student results in Mathematics 30 were used in the calculation of the gender gap.
- 10 Census 1996 data for the custom geographies used in the development of the socio-economic measures were provided by Statistics Canada.