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## Second Annual Report Card on Alberta's High Schools

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## Introduction

Prior to the preparation of the *Second Annual Report Card on Alberta's High Schools (Report Card)*, we asked ourselves a single question: Why should we measure the performance of schools?

First, we measure performance so that the schools will have an objective benchmark against which to improve. The basic design of any organization's program for continuous improvement inevitably includes a repeating cycle of measurement of relevant performance indicators; the development of an improvement plan; the subsequent execution of that plan; and the re-measurement of the performance indicators to determine progress.

Such use of results measurement as the basis for improvement is widespread. In education, it is becoming routine. For example, the United Kingdom's Department for Education and Employment annually produces and widely distributes detailed tables of performance-related measures for primary schools, secondary schools, and colleges.<sup>1</sup> Closer to home, the education authorities in California and Oregon have moved beyond simply collecting and disseminating performance data. Last year, California enacted the Public Schools Accountability Act of 1999, which requires that its State Board of Education develop an Academic Performance Index (a single statistic much like this *Report Card's Overall rating out of ten*) to measure the effectiveness of its elementary, middle, and secondary schools. In Oregon, a new state law requires the Department of Education to issue Performance Reports for the state's schools that rate the school on a number of dimensions. Like the *Report Card*, these overall indices are intended to answer an important question, "How is your school doing?"

The role of the *Second Annual Report Card on Alberta's High Schools* is to collect a variety of relevant, objective indicators of school performance into one, easily accessible, public document so that all interested parties—parents, students, school administrators, teachers, and taxpayers—can analyze and compare the performance of individual schools. 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 or not. By comparing a school's results with those of neighbouring schools or schools with similar characteristics, we can identify more successful schools and learn from them. Reference to overall provincial results establishes an individual school's level of achievement in a broader context. Each of these comparisons is made simpler and more meaningful by the indicators, ratings, and rankings contained in the *Report Card*.

Second, and equally as important, the *Report Card* measures and reports on school performance so that parents and students can make a more informed choice of an education provider. Again, by making a variety of comparisons easy, the *Report Card* facilitates the process.

Third, the vast majority of Alberta's students attend schools that are wholly or partially financed by the provincial government. For the school year 1999/2000, Alberta Learning, the government department responsible for education in Alberta, has budgeted operating and capital expenditures of approximately 3.5 billion dollars for K-12 education. A government expenditure of such magnitude demands continued, independent measurement of the results flowing from that expenditure. The results should be easily available to any interested taxpayer.

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<sup>1</sup> United Kingdom, Department for Education and Employment. Digital document: [www.dfes.gov.uk/perform.htm](http://www.dfes.gov.uk/perform.htm) (January 17, 2000).

We hope that the improvements and changes introduced in this edition allow it to serve each of these purposes better.

### **What is new in this year's Report Card?**

#### **What general improvements have been made?**

The *Second Annual Report Card on Alberta's High Schools* includes several improvements of a general nature. Where private and francophone schools meet the criteria for inclusion, their results are now included. A number of the statistics have been redefined to make the results a more accurate reflection of the schools' performance. As is discussed in greater detail on page 7, diploma examination results are now reported regardless of the grade level of the writer. The measure of the number of diploma courses taken per student has also been revised (see page 10). In addition to these general improvements, several useful new school performance indicators have been added.

#### **Do the socio-economic circumstances of the school's students affect results?**

In this edition we have introduced an indicator of the socio-economic background of the school's student body. It enables parents and school officials to compare their school's results with those of schools with similar student-family characteristics. More information on this family background indicator can be found on page 12 below.

#### **Is there a difference between the results of the two sexes at the school?**

In June of last year, the Fraser Institute released *Boys, Girls and Grades: Academic Gender Balance in British Columbia's Secondary Schools*. Among other

conclusions, the study found that especially where student assessment was made at the school level, girls were likely to do better than boys. Similar findings for Alberta students were reported in an internal study prepared for the Calgary Board of Education in 1997.<sup>2</sup>

The British Columbia study also found that the frequency and size of sex-based differences varied markedly between schools. The authors concluded: "Our findings suggest that the province's schools have great potential for improvement in the extent to which they enable learners of both genders to perform to their potential."<sup>3</sup> Analysis of this aspect of Alberta schools' performance indicates similar variations from school to school.

The Gender Gap indicator and ranking appears for the first time in this second edition. The indicator reports the sex that received the highest average school mark in each of two important courses—English 30 and Mathematics 30—as well as the actual difference in percentage points between the two results. It shows how effective the school has been in helping students of both sexes to succeed.

Improving school results for students of both sexes requires continued research and experimentation. School-level initiatives can make a difference. A statistical review conducted by the Notley High School<sup>4</sup> in Essex, England, showed that boys were not doing as well as their female counterparts at school, particularly in reading comprehension. Teachers and school officials began experimenting with a variety of mechanisms to improve boys' learning while maintaining or improving that of the girls. These included teaching boys differently from girls, closer individual monitoring, early remedial work where required, and an overhaul of classroom seating strategies. Im-

<sup>2</sup> Pat Boyle. *Gender Issues: An Annual Report of the Advisor on Gender Issues 1997*. Calgary Board of Education, (December) 1997: pages 27–40.

<sup>3</sup> 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): page 23.

<sup>4</sup> The Notley High School and Essex Inspection and Advisory Service. *Raising Boys' Achievement 1996–1998*. Digital document: [notley-high.essex.sch.uk/rba/rba.html](http://notley-high.essex.sch.uk/rba/rba.html) (January 17, 2000).

portantly, teachers reported that becoming personally aware of this systematic problem was of enormous value to them. That awareness came from the measurement and publication of results.

### **Do students in the school do better in some courses than in others?**

In order to provide more in-depth information to parents, administrators, and other interested groups, the *Report Card* also includes the 1998/1999 results in the four diploma courses most frequently taken at the school. Both average final examination mark and the rate of participation are provided. Readers can easily compare a school's performance in a variety of courses and can also compare corresponding results among schools.

Both of these new indicators provide school administrators, teachers, counsellors, and parents with additional, useful objective data upon which to plan improvements that will make the school more effective.

### **What plans are being developed for future editions?**

#### **Is anybody there? Taking the pulse of the school by measuring student attendance levels.**

Good school attendance—when it is matched with effective teaching—does matter and measures of attendance should be part of any assessment of school effectiveness. First and foremost, regular attendance at school is an important driver of academic success. A study of students in undergraduate economics classes found that “the difference in performance between a student who attends regularly and one who attends sporadically is about a full letter grade.”<sup>5</sup> The study provided compelling evidence that attendance itself

was a determinant of success in the course. But, it is not just grades that suffer when students skip classes. Research shows that grade-school truancy may lead to dropping out of school, may be a precursor to delinquent and criminal activity, and places students at higher risk of being drawn into behaviours involving drugs, alcohol, or violence.<sup>6</sup> The same research cited the remarkable statistic that a three-week sweep for truants in Van Nuys, California, reduced shoplifting arrests during the same period by 60 percent. Since attendance matters to students' success and welfare, a measure of the effectiveness of schools in promoting good attendance is undoubtedly a valid addition to the *Report Card's* indicators of school performance.

Attendance data also provide a measure of the extent to which the school engages the students' interest. Secondary-school students will allocate their scarce time resources among school, leisure activities (both positive and negative in nature), and employment. The degree to which students make school their top priority will be reflected in the school's average attendance level. Schools where the attendance is high have found ways to motivate students to invest more time in their studies. If the school cannot compete with the local mall or play-centre, attendance rates will fall.

#### **Is the school improving academically?**

##### **The Progress indicator**

On all but the Specific Course Results indicator (see page 13), The *Report Card* provides four years of data. Unlike a simple snapshot of one year's results, this historical record provides evidence of change (or lack of change) over time. Sometimes, however, it can be difficult to determine whether a school's performance is actually improving or deteriorating simply by scanning several years of data.

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<sup>5</sup> David Romer, Do Students Go To Class? Should They? *Journal of Economic Perspectives* 7, 3 (Summer 1993): pages 167–74; at page 167.

<sup>6</sup> Eileen Garry, *Truancy: First Step to a Lifetime of Problems* (Washington, DC: Office of Juvenile Justice and Delinquency Prevention, October 1996).

In order to detect trends in the performance indicators more easily, we have developed a progress indicator. It uses regression analysis to help identify those dimensions of school performance where there has been a real change rather than a fluctuation in results caused by random occurrences outside the control of the school. Because trend calculation is uncertain when only a small number of data points is available, we will delay introduction of this indicator until next year. By then, five years of school performance will have been accumulated for most schools.

### **A word of thanks**

The improvements that are planned for the *Report Card* have been prompted, in part, by the comments and criticisms we received from teachers, school and district administrators, parents, and other interested individuals from across Alberta. We wish to thank all those who took the time to share their suggestions with us. We hope that the *Second Annual Report Card on Alberta's High Schools* will elicit even more ideas.

## A Measure of Academic Effectiveness for High Schools

The foundation of the *Second Annual Report Card on Alberta's High Schools* is an overall rating of each school's academic performance. Building on student results data provided by Alberta Learning, we rate each school on a scale from zero to 10.

### How does the school perform on key academic indicators?

We base our overall rating of each school's academic performance on five 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 Diploma courses taken per student
- 5 Diploma completion rate.

We have selected this set of indicators because they provide systematic insight into a school's performance.<sup>7</sup> 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.

To make the indicators as transparent as possible we have kept manipulation of the data from Alberta Learning to the very minimum required. The process by which the five indicators are developed involves no significant editing of the raw

data. Thus, parents, administrators, teachers, or other interested parties can replicate our measures with a minimum of effort.

### Three indicators of effective teaching

The indicators of effective teaching are based on a different set of data than that used previously. Whereas the 1999 edition analyzed diploma course results only for students who were enrolled in grade 12 at the time they took the course, the new set of data includes diploma-course results for all students taking the course regardless of the grade level in which they were enrolled. This improvement provides a more complete picture of student achievement in the diploma courses.

In order that the historical course results remain comparable, all the affected indicators have been recalculated using the new data-set. For this reason, there may be slight variations between the historic indicator values in this edition and the corresponding values published last year.

#### 1 Average diploma examination mark

This indicator (noted in the tables as *Average exam mark*) is the average percentage achieved by a school's students on the uniform final examinations in all of the diploma courses. 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

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<sup>7</sup> The data from which the various indicators in this *Report Card* are derived is contained in databases maintained or controlled by Alberta Learning. Alberta Learning provided the relevant statistics for those public, separate, private, and francophone schools that met the criteria for inclusion for each of the four school years between September 1995 to August 1999 in response to our various requests under the Freedom of Information and Protection of Privacy Act.

the year, weighted by the relative number of students who completed the course.

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 diploma examinations. There is also variation within schools in the results obtained in different subject areas (see page 13). Such differences in outcomes cannot be explained solely by the personal and family characteristics of the student body. 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 (noted in the tables as *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 where a failing grade was awarded by the total number of course completions by the students of that school.

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. In most cases, a student need only successfully complete two diploma courses in order to obtain a diploma. Such a student's course of study may not include the prerequisites for all post-secondary

educational options but it will be sufficient to obtain a diploma. Thus, students enrol in the diploma courses, in large measure, because they want to take them. Further, the success in diploma courses reflects to a certain extent how well students have been prepared in the lower grades. All of the diploma courses have prerequisites. Indeed, depending on the school, admission to the diploma course 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 diploma examinations failed as an additional indicator of the effectiveness of the teaching in high schools.

## 3 Difference between examination mark and school mark

For each school, this indicator (noted in the tables as *School vs exam mark difference*) 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>8</sup>

Effective teaching includes regular testing of students' knowledge so that they may be aware of their progress. For such assessment to be useful, it must accurately reflect the student's understanding of the course material. 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 addi-

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<sup>8</sup> A student's final mark for a diploma course is derived from both the mark received on the course's uniform diploma examination and a mark provided by the school. The final mark is the weighted average of the examination mark that accounts for 50 percent and the school mark that accounts for the remaining 50 percent.



tional 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.

The effectiveness of school-based assessments can be determined by a comparison to external assessments of the students. Alberta Learning, the same authority that designed the course, administers the uniform diploma examination. This examination tests the students' knowledge of the material contained in the course. If the marks assigned by the school are a reasonably accurate reflection of students' understanding, they 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, on average a school is consistently granting marks substantially different than those achieved by its students on the final examinations, then the school is not providing an accurate indicator of the extent to which the knowledge of the course material is being acquired.

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

During the high school years, students must make a number of decisions of considerable significance about their education. They will, for instance, annually decide whether to start or continue learning a second language. In grade 10, they are required to choose between different streams in Mathematics, Social Studies, English, and Science. A year or two later, 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 ten* 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 and enrolled in grade 12, they must decide whether to stick it out, do the work, and graduate with their class.

A decision in the negative would be comfortable for a student, especially one who lacks the kind of support that we are trying to measure. Students can quite easily rationalize taking less rigorous courses in grade 12 on the basis that these courses more closely parallel their present interests. Likewise, there are all sorts of reasons that can be advanced for deferring graduation: "The few courses I need can be picked up later." "I'm going to fail anyway, so why try?" "There's a job that pays \$15.82 an hour available right now, so I can't afford to stay in school." The list is conveniently long. The decisions to be measured have been chosen because students without well-informed counsel may well select the more comfortable yet perhaps less productive options.

## 1 Diploma courses taken per student

The method used to calculate this indicator has changed substantially from that used in the last edition. Noted in the tables as *Courses taken per student*, it measures the average total 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 the course participation rates provided by Alberta Learning for all the diploma courses taken by students enrolled at that school.

In their senior years, students have freedom to choose among 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 variety of post-secondary options open to them.

Diploma courses offer study at the senior level in a variety of core disciplines: English, French, the sciences, mathematics, and the humanities. Course offerings include alternatives that reflect the post-secondary ambitions of different groups of students. So, 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 enrolment. 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

For each school, this indicator reports the percentage of first-time grade 12 students who received a diploma in the reported school year.

A high-school diploma 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, students 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 receipt of a diploma are not particularly onerous. The chance that students will not earn a diploma solely because they are unable to meet the intellectual demands of the curriculum is, therefore, relatively small.

Nevertheless, the diploma-completion rate varies quite widely from school to school throughout the province. 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 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**

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. Noted in the tables as *Overall rating out of ten*, it answers the question, "In general, how is the school doing academically?"

To derive this rating, the results for all the years were converted into a score out of 10. This was accomplished using the following procedure. For each indicator, the results from the base-year (1995/96) were sorted from highest to lowest. They were then divided into 10 ranges and each range (decile) was assigned a score between 10 and 1. The range that included the top 10 percent of results was given a 10; the next range, a 9; and so on.

The results from each subsequent year were then assigned the number score corresponding to the range of values established in the base-year into which each fell.

The number scores for the five indicators were then averaged to produce the annual overall rating for each school. The decile range tables for each of the indicators are provided in Appendix 2, page 102.

## Other Indicators of School Performance

This year, we have added other indicators that, while they are not used to derive the *Overall rating out of ten*, add more information on the school's effectiveness.

### How well does the school take into account differences among students?

#### The socio-economic indicator

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 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.

The socio-economic indicator was derived as follows. First, using enrollment data from Alberta Learning sorted by census enumeration area and census data provided by Statistics Canada,<sup>9</sup> we established a profile of the student body's home characteristics for each of the schools listed 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 ten*.

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, only a small degree of the variation in the *Overall rating* from school to school is associated with the socio-economic factors studied. Clearly, many other factors—including good teaching, counseling, 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 the school enables all of its students to succeed, the weaker will be the relationship between the home characteristics of its students and their academic success. Thus, this socio-economic indicator should not be used as an excuse or rationale for poor school performance. Rather, it should be used simply as a tool with which to identify schools whose student bodies have similar characteristics. The effective school will produce good results regardless of the family background of its students.

Results of the multiple regression analysis used to derive this socio-economic indicator can be found in *Appendix 2: Measuring socio-economic context*.

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<sup>9</sup> For each enumeration area, Statistics Canada, using data from the 1996 Canadian census, calculated socio-economic characteristics for families having at least one child between the ages of 11 and 16 years as of the date of the census.

### The *Gender Gap* indicator

Data from Alberta Learning reveals systematic sex-based differences in academic results in Alberta's high schools. These differences are particularly apparent where the local school rather than Alberta Learning makes the assessment. However, previous research has 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>10</sup> Further, "[t]he differences described by each indicator vary from school to school over a considerable range of values."<sup>11</sup>

The *Gender Gap* indicator measures the difference, if any, between the average school marks for male students and female students in two of the most popular diploma courses—English 30 and Mathematics 30. It reports the size of the difference and the more successful sex.

The *Gender Gap* indicator provides a measure of the effectiveness of the school in helping all of its students to succeed. Schools with a low gender gap are more successful than are others in helping students of both sexes to reach their potential.

### **Are there any academic strengths or weaknesses at the school?** **Course Results for specific courses**

While the basic academic indicators and the *Overall rating* described above provide an overview of the effectiveness of the school's academic

programs, they do not tell us anything about the relative effectiveness of the specific academic departments within the school.

For example, at Foothills Composite in High River, the school's average mark on the English 30 examination was 61.8 percent, within one and one-half percentage points of the provincial average. On the other hand, the school's average mark on the Mathematics 30 examination was 57.1 percent, seven and one-half percentage points below the provincial average.

The *Second Annual Report Card on Alberta's High Schools* introduces a snapshot of the results in the diploma courses most frequently taken at the school (noted in the tables as *1998/1999 Course Results*) so that comparisons between different departments at the same school can be made. The indicator reports the average examination mark as a measure of the department's teaching effectiveness. The *Participation rate* (shown in brackets) indicates the extent to which the students have been encouraged to involve themselves in the subject area. (The participation rate is the ratio, for a school, between the number of students who have completed a given diploma course and the number of students enrolled in their third year of high school—usually grade 12.) This information along with course-specific data from the province as a whole (provided in the notes on page 17) and from other schools can help parents, teachers, and administrators select specific subject areas where student achievement or participation rates might be improved.

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<sup>10</sup> Cowley and Easton, *Boys, Girls and Grades*: page 7.

<sup>11</sup> Cowley and Easton, *Boys, Girls and Grades*: page 17.