

Educational Spending Relative to the GDP in 2001

A comparison of Québec and the OECD Countries

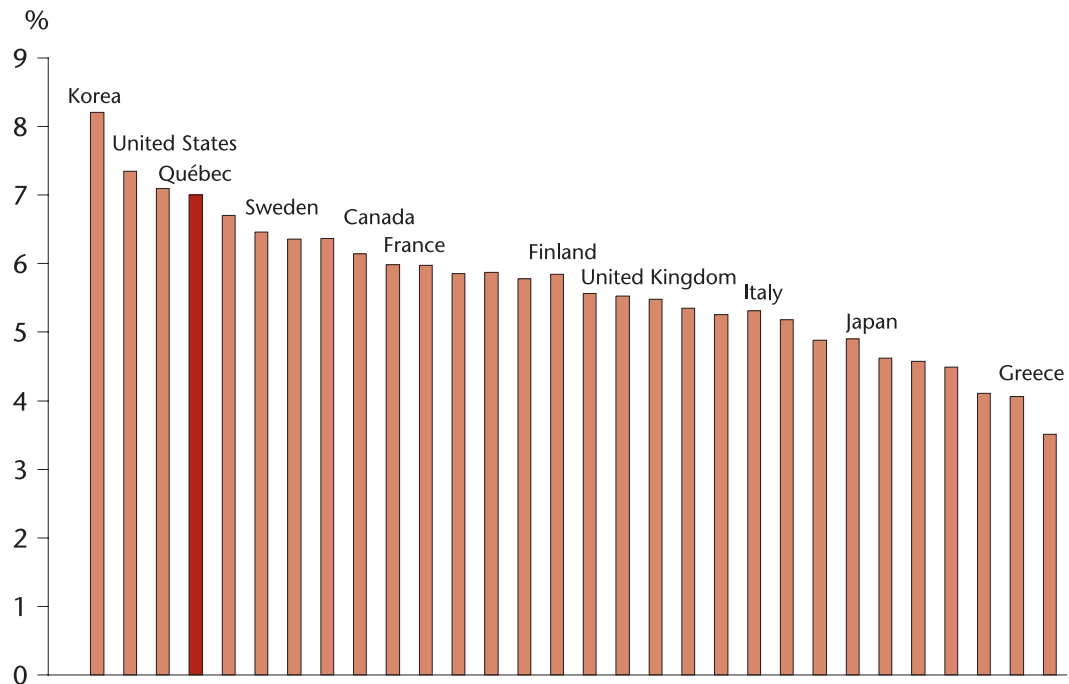
Introduction

How does Québec's financial investment in education rank? To help us answer this question, we need to define the appropriate indicators and study comparable data for other regions or countries.

The indicator most often used to measure financial investment in education is the percentage of the gross domestic product (GDP) spent on education. This indicator measures the relative share of a state's wealth that is invested in education. In this context, we can ask what percentage of the GDP is allocated to education in Québec; how this financial investment compares to that of other provinces, the United States and member countries of the Organisation for Economic Cooperation and Development (OECD); and what explains these differences.

In the *Education Indicators*¹ publication, comparisons are drawn between the other provinces and the United States. In this bulletin, the comparison is made between Québec and the OECD countries.

Graph 1 Total educational spending in relation to GDP for Québec and OECD countries in 2001



¹ Direction de la recherche, des statistiques et des indicateurs, *Education Indicators*, Ministère de l'Éducation, du Loisir et du Sport, annual publication.

In September 2004, the OECD published a new edition of *Education at a Glance: OECD Indicators*. Among the indicators presented, there is an international comparison of the portion of the GDP allocated to education. The concept of expenditure used in calculating the portion of the GDP allocated to education is the overall spending figure. Total educational spending includes the operating and capital expenses of all levels of public and private education, government contributions to employee pension plans, the cost of student financial assistance and other education-related expenses².

Québec can be ranked against the OECD countries by considering the table in Appendix 1, which shows data for the following levels of instruction: preschool, elementary, secondary, non-university postsecondary and university education. The last column in the table shows the totals of all the levels of instruction (including non-categorized expenses). In addition, at the bottom of the tables in Appendixes 1 and 2, we show the average for the OECD countries considered, as well as an adjusted average, which excludes countries that have a particularly low per capita GDP. This adjusted average was used for our comparisons between Québec and OECD countries.

Educational Spending Relative to the GDP

In 2001, Québec spent a larger portion of its GDP on education (7.0%) than the rest of Canada (5.9%) and the OECD countries (5.8%). In fact, only Korea, the United States and Denmark spent a larger portion of their GDP on education than Québec. The other 26 countries examined by the OECD spent a smaller portion of their GDP on education. As compared to 1994, we notice a decrease in overall spending relative to the GDP in Québec as well as in the rest of Canada and the OECD countries; however, the United States marked an increase (Table 1).

Table 1 Overall Education Spending Relative to the GDP (%)

	1994	1997	1999	2001
QUÉBEC	8.0	7.0	7.0	7.0
CANADA EXCLUDING QUÉBEC	7.0	6.4	6.2	5.9
CANADA	7.2	6.5	6.6	6.1
UNITED STATES	6.6	6.9	7.0	7.3
ADJUSTED AVERAGE FOR OECD COUNTRIES	6.2	5.9	5.9	5.8

The table in Appendix 1 presents data by country for 2001 and, as indicated above, by level of instruction. The portion of the GDP allocated to preschool, elementary and secondary education in Québec is below the adjusted average of OECD countries; however, this figure is clearly higher in Québec relative to non-university postsecondary and university education.

² The concept of spending used in the MELs's *Education Indicators* (total spending concept used by Statistics Canada) is not exactly the same as the one retained by the OECD. For comparison purposes, spending data for Québec and the rest of Canada in this table have been adjusted to correspond with the OECD's definition. Education spending data is for the 2001 calendar year.

These differences are partially explained by the structural differences between the education systems: preschool services are more developed in many OECD countries (admission at 3 years of age) than in Québec; elementary and secondary schooling is shorter in Québec than elsewhere in the world; characteristics specific to Québec's college system (such as the requirement to complete two years of college studies before entering university); and research expenses, which are higher in North-American universities than in European universities.

Based on structural differences and the available information, we have chosen to compare financial investment in the overall education system (all levels of instructions taken together). The gap between the portion of the GDP allocated to education in Québec (7.0%) and the adjusted average of OECD countries (5.8%) is 1.2 percentage points, which represents a considerable difference. In terms of the Québec GDP (\$232.6 billion in 2001), 1.2% represents \$2.8 billion.

To explain the greater financial investment in Québec, we will use all the information available on factors that play a role in this difference. These factors can be grouped into four general indicators: spending per student, collective wealth (defined by the per capita GDP), school attendance rates and the demographic factor (see Appendix 4). When considering all levels of instruction together, the school attendance rate is defined by the ratio of enrollment to the population aged 5 to 29, while the demographic factor is defined by the ratio of the total population aged 5 to 29 to the total population.

The following simulation will help readers understand the role of each factor in determining the financial investment of each area. Let us suppose that the factors are the same in all regions, except one. If the spending per student is different, the region with the higher spending demonstrates a greater financial investment due to the greater amount of resources allocated to education.

The less wealthy area (with a lower per capita GDP) spends a greater portion of its GDP on education than the more wealthy area for the same quantity of resources allocated to its students. If the school attendance rate or the proportion of the school-age population is different, then a higher ratio will reflect a larger financial investment because more financial resources are required.

Total Educational Spending Per Student

Table 2 shows data on total spending per-student for elementary, secondary and university education as well as the totals for all levels of instruction. Currently, the data do not allow us to make comparisons for college-level education. However, data for college education are included in the totals for all levels of instruction.

Table 2 Total educational spending per-student by level of instruction in public institutions in Canadian dollars converted using the Purchasing Power Parity (PPP) rates in 2001

	Elementary	Secondary	University	All ³
QUÉBEC	7 105	8 740	17 854	10 791
ADJUSTED AVERAGE FOR OECD COUNTRIES	6 758	8 892	14 197	8 667
DIFFERENCE (%)	5	-2	26	25

3 Including preschool and college education as well as non-categorized expenses.

This shows that in Québec the overall spending per student at the elementary and secondary levels of instruction was fairly similar to the adjusted average of OECD countries. As for the university level, overall spending per student in Québec was 26% higher than the average spending per student in OECD countries⁴.

The table in Appendix 2 shows the overall spending per student by country and level of instruction. At the university level, only the following countries have a greater or somewhat similar spending per student figure than Québec: Denmark, Sweden, Switzerland and the United States.

In addition to including the elementary, secondary and university levels of instruction, the total spending per student also includes preschool and college levels as well as non-categorized expenses (retirement plans, professional development outside of the educational institutions, financial aid to students, etc.). In 2001, the overall spending per student for all levels of instruction was \$10 791 in Québec, as compared to an average spending figure of \$8 667 in the OECD countries. This represents a gap of 25%.

Currently, the OECD does not provide all the data necessary to fully understand the differences between educational spending per student for the countries studied. Available data primarily concerns the elementary and secondary education while little information is available for the higher levels of instruction.

In another *Education Statistics Bulletin*, we presented a comparison between Québec and the OECD countries based on cost of statutory salaries of teachers per student at the elementary and secondary levels of instruction in 2000-2001⁵. To explain the gaps observed in the cost of statutory salaries, the following four factors were considered: statutory teacher salaries, annual student classroom time, annual teaching time required of full-time teachers and class size.

This model shows that, in general, two cost factors were higher in Québec than the OECD average in 2000 (teacher salaries were higher and teaching time was lower) and two cost factors were lower (student classroom time was lower at the secondary level of instruction and class sizes were larger). In total, the cost of statutory salaries of teachers per student is higher than the average of OECD countries.

Collective Wealth

The second factor considered in the analysis of the difference between Québec and the OECD average, in terms of the percentage of the GDP spent on education, is collective wealth. In the present case, the per capita GDP is used as the indicator of collective wealth.

In 2001, Québec's per capita GDP was \$31 444 as compared to \$32 215, the adjusted average for the OECD countries. This represents a difference of 2% (appendix 3). Since Québec is slightly less wealthy than the adjusted OECD average, for a given educational expenditure, Québec spends a larger portion of its GDP. This factor thus contributed to widening the gap between the relative amount of financial support for education in Québec and the OECD average (see the summary of contributing factors later in this document).

⁴ For the purposes of calculating overall spending per student at the university level in Québec, subsidized research was excluded.

⁵ Marius Demers, *Cost of Statutory Salaries of Teachers per Student for Elementary and Secondary School Levels: A Comparison of Québec and OECD Countries, 2000-2001*, DRSI, MELS, N° 29, November 2003.

School Attendance Rates

The school attendance rate is defined here as the ratio of total enrollments (expressed in full-time enrollment equivalents) for all levels of instruction to the population of 5-to-29-year-olds. A higher school attendance rate for an area indicates (all other variables being equal) that more individuals attend school in this area and, therefore, that a larger financial investment in education is required.

The 2004 edition of *Education at a Glance: OECD Indicators* does not supply data on school attendance rates. In order to calculate the relative contribution of various factors to the difference between the financial support provided by Québec and the average support provided by OECD countries, we had to estimate the school attendance rate. The following table presents a comparison of enrollment rates⁶, by age, between Québec and the OECD average.

Table 3 Enrollment rates (%) per age group in 2001-2002

	Students aged 5 to 14 years as a % of the population of the same age group	Students aged 15 to 19 years as a % of the population of the same age group	Students aged 20 to 29 years as a % of the population of the same age group
QUÉBEC	98.1	84.4	30.0
AVERAGE FOR OECD COUNTRIES	98.5	79.4	22.7

The enrollment rate for students between 5 and 14 years old is slightly lower in Québec, but the Québec rates for students in the 15-to-19 and 20-to-29 age groups are higher than the OECD average. The higher enrollment rates for older students are explained by a higher school attendance rate in Québec post-secondary schools. Considering the total population aged 5 to 29, we estimate that the enrollment rate in Québec (67%) is higher than the OECD average (63%).

Demographic Factor

The age structure of the population of the areas considered also contributes to differences observed in the proportion of the GDP spent on education.

The demographic factor is defined here as the proportion of the total population that is between 5 and 29 years of age, which is the segment of the population that is most likely to attend school. For a given area (all other variables being equal), a larger proportion of young people in the total population indicate that there will be more persons attending school in this area and that, therefore, a greater financial investment in education will be required.

In 2001, this proportion was 32% in Québec, whereas the OECD average was 34%. The fact that the school-age population is smaller in Québec contributed to reduce the gap between Québec's financial support of education and the average of the OECD countries considered.

⁶ The enrollment rate is calculated by dividing the number of students in a given age group by the general population in the same age group. School enrollment is expressed in terms of the number of individuals enrolled in either full-time or part-time programs.

It should also be noted that this proportion greatly decreased in Québec between 1981 and 2001: it declined from 43% to 32%. This could have caused a significant decrease in financial support for education. However, such was not the case because, at the same time, there was a great increase in school attendance rate. Thus, the opposite effects of these two factors cancelled each other out to a considerable extent.

Summary of Contributing Factors

In 2001, Québec allocated 7.0% of its GDP to education, compared with the OECD country average of 5.8%, for a difference of 1.2 percentage points.

Table 4 indicates the degree to which the main factors contribute to this difference. The “positive” factors are those that increase educational spending in Québec and the “negative” factors are those that reduce it.

Table 4 Impact of the various factors on the difference between the proportion of the GDP dedicated to education in Québec and the OECD average in 2001

Educational spending relative to the GDP in Québec (%)	7.0
Educational spending relative to the GDP for the OECD countries (%)	5.8
Difference (Québec – OECD countries) in percentage points	1.2
Contribution of factors to the difference in percentage points:	
Spending per student higher in Québec	1.4
Per capita GDP lower in Québec	0.2
School attendance rates slightly higher in Québec	0.1
Demographic factor (fewer young people in Québec)	-0.4
Residual factor	-0.1
Total	1.2

In 2001, Québec’s total educational spending per student at all levels of instruction (\$10 791) was 25% higher than the adjusted OECD average (\$8 667). This factor contributes 1.4 of a percentage point to the difference in the portion of the GDP dedicated to education in Québec and the OECD average.

In addition, Québec’s per capita GDP (\$31 444), which was slightly less than the adjusted OECD average (\$32 215), also increased the difference in the portion of the GDP dedicated to education by 0.2 of a percentage point.

With regard to the slightly higher school attendance rate in Québec, its contribution is 0.1 of a percentage point. The demographic factor (relatively fewer young people in Québec) contributed to reduce the gap to 0.4 percentage points between the portion of the GDP dedicated to education in Québec and the adjusted average for OECD countries.

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APPENDIX 1 – TOTAL EDUCATIONAL SPENDING IN RELATION TO GDP IN QUÉBEC AND THE OECD COUNTRIES IN 2001, BY EDUCATIONAL LEVEL (%)

	Preschool Elementary Secondary Education	Non-University Postsecondary Education	University Education	Partial Total (Postsecondary Education)	All Levels ⁷ (including non-categorized expenses)
KOREA	4.7	0.7	2.0	2.7	8.2
UNITED STATES	4.6	n/a	2.7	2.7	7.3
DENMARK	5.1	n/a	n/a	1.8	7.1
ICELAND	5.0	n/a	0.9	0.9	6.7
SWEDEN	4.8	n/a	n/a	1.7	6.5
BELGIUM	4.8	n/a	n/a	1.4	6.4
NORWAY	4.6	n/a	n/a	1.3	6.4
CANADA	3.6	1.1	1.5	2.5	6.1
FRANCE	4.8	0.2	0.8	1.1	6.0
AUSTRALIA	4.3	0.2	1.4	1.6	6.0
PORTUGAL	4.6	n/a	n/a	1.1	5.9
MEXICO	4.7	n/a	n/a	1.0	5.9
AUSTRIA	4.4	0.1	1.1	1.3	5.8
FINLAND	4.1	n/a	1.7	1.7	5.8
POLAND	4.4	n/a	1.0	1.0	5.6
NEW ZEALAND	4.4	0.3	0.7	1.1	5.5
UNITED KINGDOM	4.4	n/a	n/a	1.1	5.5
SWITZERLAND	4.7	n/a	1.2	1.2	5.3
GERMANY	3.9	0.3	1.0	1.3	5.3
ITALY	4.1	n/a	0.9	0.9	5.3
HUNGARY	3.6	0.2	1.1	1.3	5.2
SPAIN	3.7	0.2	1.1	1.2	4.9
NETHERLANDS	3.6	n/a	1.3	1.3	4.9
JAPAN	3.1	0.1	1.0	1.1	4.6
CZECH REPUBLIC	3.5	0.1	0.8	0.9	4.6
IRELAND	2.9	n/a	n/a	1.3	4.5
SLOVAKIA	3.1	n/a	0.9	0.9	4.1
GREECE	2.6	0.2	0.9	1.1	4.1
TURKEY	2.5	n/a	n/a	1.1	3.5
OECD AVERAGE	4.1	0.3	1.2	1.4	5.5
OECD ADJUSTED AVERAGE⁸	4.3	0.4	1.3	1.5	5.8
QUÉBEC	3.9	1.4	1.7	3.1	7.0
CANADA EXCLUDING QUÉBEC	3.5	0.9	1.5	2.4	5.9

n/a: Not available

Sources: OECD countries: *Education at a Glance: OECD Indicators 2004* Table B2.1c

Québec and Canada excluding Québec: Direction de la recherche, des statistiques et des indicateurs, ministère de l'Éducation, du Loisir et du Sport.

⁷ The totals may be slightly different than the sum of the subtotals due to rounding off.

⁸ Countries with particularly low per capita GDP figures were excluded from the comparison (countries in italics: Hungary, Greece, Poland, Mexico, Czech Republic, Slovakia and Turkey).

Note: The concept of spending used in the MELSS *Education Indicators* (total spending concept used by Statistics Canada) is not exactly the same as the one retained by the OECD. For comparison purposes, spending data for Québec and the rest of Canada in this table have been adjusted to correspond with the OECDs definition.

**APPENDIX 2 – TOTAL PER-STUDENT EDUCATIONAL SPENDING, QUÉBEC
AND OECD COUNTRIES, PER LEVEL OF INSTRUCTION IN 2001**
(in PPP-converted Canadian dollars)

	Elementary education	Secondary education	University education ⁹	Total
AUSTRALIA	6 062	8 687	16 385	8 456
AUSTRIA	7 885	10 274	13 658	10 154
BELGIUM	6 385	9 494	13 907	9 058
CANADA	n/a	n/a	n/a	n/a
CZECH REPUBLIC	2 245	4 138	7 089	3 802
DENMARK	9 086	9 736	17 136	10 890
FINLAND	5 650	7 844	13 371	8 101
FRANCE	5 732	9 728	10 427	8 548
GERMANY	5 084	7 944	13 567	8 035
GREECE	3 959	4 522	6 225	4 417
HUNGARY	3 110	3 160	8 719	3 905
ICELAND	7 648	8 718	9 205	8 522
IRELAND	4 492	6 294	12 004	6 353
ITALY	8 140	9 910	9 924	9 407
JAPAN	6 925	7 841	13 792	8 421
KOREA	4 457	6 191	9 883	6 043
LUXEMBOURG	9 448	13 309	n/a	n/a
MEXICO	1 628	2 298	5 209	2 152
NETHERLANDS	5 834	7 684	15 653	8 079
NEW ZEALAND	n/a	n/a	n/a	n/a
NORWAY	8 885	10 848	15 827	10 804
POLAND	2 786	n/a	4 299	3 087
PORTUGAL	5 017	7 171	6 239	6 111
SLOVAKIA	1 502	2 249	6 342	2 437
SPAIN	5 002	6 530	8 980	6 462
SWEDEN	7 554	7 778	18 226	9 134
SWITZERLAND	8 267	13 099	26 178	10 554
TURKEY	n/a	n/a	n/a	n/a
UNITED KINGDOM	5 298	7 120	12 904	7 167
UNITED STATES	9 072	10 535	26 681	13 045
OECD AVERAGE	5 821	7 812	12 378	7 429
OECD ADJUSTED AVERAGE¹⁰	6 758	8 892	14 197	8 667
QUÉBEC	7 105	8 740	17 854	10 791

n/a: Not available

Sources: OECD countries: *Education at a Glance: OECD Indicators 2004* Table B1.1

Québec and Canada excluding Québec: Direction de la recherche, des statistiques et des indicateurs, ministère de l'Éducation, du Loisir et du Sport.

9 For purposes of comparing Québec with OECD countries, and taking into account the OECD classification system (ISCED-97), we have considered per-student spending for tertiary education (type A tertiary education and advanced research degrees, where country data were available, otherwise the total amount for tertiary education was used).

10 Countries with particularly low per capita GDP figures were excluded from the comparison (countries in italics: Hungary, Greece, Mexico, Poland, Czech Republic, Slovakia and Turkey).

**APPENDIX 3 – PER CAPITA GROSS DOMESTIC PRODUCT (GDP)
FOR QUÉBEC AND OECD COUNTRIES IN 2001**
(in PPP-converted Canadian dollars)

AUSTRALIA	32 022
AUSTRIA	34 047
BELGIUM	32 516
CANADA	35 148
CZECH REPUBLIC	17 833
DENMARK	35 068
FINLAND	31 612
FRANCE	32 182
GERMANY	30 543
GREECE	20 424
HUNGARY	15 651
ICELAND	34 762
IRELAND	35 786
ITALY	30 452
JAPAN	31 963
KOREA	19 099
MEXICO	10 978
NETHERLANDS	34 453
NEW ZEALAND	25 475
NORWAY	43 904
POLAND	12 433
PORTUGAL	21 494
SLOVAKIA	13 587
SPAIN	25 616
SWEDEN	32 283
SWITZERLAND	36 044
TURKEY	7 255
UNITED KINGDOM	32 058
UNITED STATES	42 215
OECD AVERAGE	27 824
OECD ADJUSTED AVERAGE¹¹	32 215
QUÉBEC	31 444
CANADA EXCLUDING QUÉBEC	37 018

n/a: Not available

Sources: OECD countries: *Education at a Glance: OECD Indicators 2004* Table X2.1

Québec and Canada excluding Québec: Direction de la recherche, des statistiques et des indicateurs, ministère de l'Éducation, du Loisir et du Sport.

11 Countries with particularly low per capita GDP figures were excluded from the comparison (countries in italics: Hungary, Greece, Mexico, Poland, Czech Republic, Slovakia and Turkey). In addition, Luxembourg was excluded because OECD does not supply data on total educational spending in relation to GDP for this country.

APPENDIX 4 – FACTORS ACCOUNTING FOR THE DIFFERENCE BETWEEN THE PERCENTAGE OF GDP DEDICATED TO EDUCATION IN QUÉBEC AND THE OTHER REGIONS

To explain the differences observed between the percentage of GDP dedicated to education in Québec and the other regions, it is necessary to compare the main factors determining the level of financial support provided by each region. These factors are: total educational spending per student, per capita GDP, a school attendance rate indicator defined by the proportion represented by the number of students in the 5-to-29-year-old population and a demographic factor defined by the ratio of the 5-to-29 age group to the total population (according to the methodology established by the OECD)¹².

The equation used is as follows:

$$\frac{\text{EXP}}{\text{GDP}} = \frac{\text{EXP}}{\text{FTE}} \times \frac{1}{\text{GDP/POP}} \times \frac{\text{FTE}}{5-29} \times \frac{5-29}{\text{POP}}$$

Where,

EXP:	total spending for all levels of instruction
GDP:	gross domestic product
FTE:	enrollments in full-time equivalents
POP:	total population
EXP/GDP:	proportion of the GDP spent on all levels of instruction
EXP/FTE:	spending per student
GDP/POP:	per capita GDP
FTE/5 – 29:	school attendance rates
5 – 29/POP:	demographic factor

¹² The formulas used to calculate the contribution of each factor to the difference between the percentage of GDP dedicated to education in Québec versus the OECD average are not included in this document, but are available upon request.