December
2005

# PERSPECTIVES

ON LABOUR AND INCOME

# Education indicators

In today's world, education is more important than ever—for both individuals and nations. This human capital is instrumental to economic growth, productivity, and living standards. In an environment of increasing globalization and outsourcing, the demand for learning is growing and changing. Government and enterprises everywhere are engaged in improving the education and skills of people in cost-effective and equitable ways.

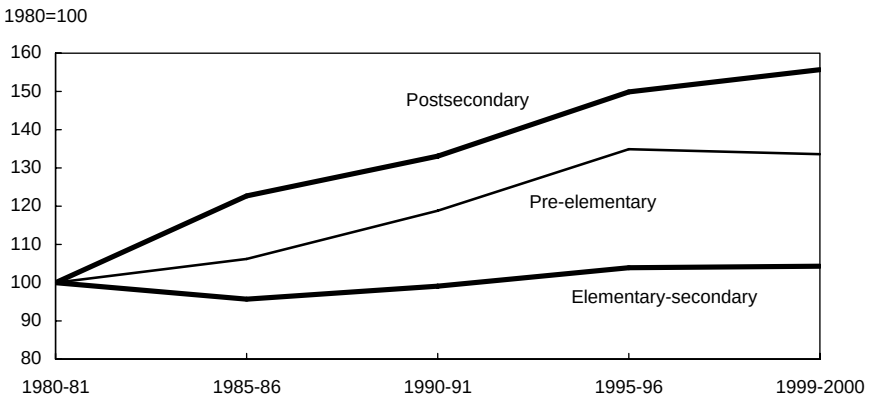
In Canada, education is a provincial or territorial responsibility. Each province or territory controls financing and administration, and sets its own teaching standards. The federal government has a limited role. It provides financing to special schools such as those for Aboriginal people or for the physically disabled or visually impaired. In addition, it contributes to universities by creating special chairs or by funding research and development activities. Student loans and tax-deferred plans to save for education are also federal initiatives. Municipal governments deliver funds to elementary and secondary schools from property taxes or provincial transfers. Both enrolment and funding at all levels of education have been affected by changing socio-demographics: a declining birth rate, aging of the population, almost stagnant incomes, and increasing immigration.

These issues are examined in this first segment of indicators on education, which contains 24 charts highlighting developments over the last two decades. Future segments will focus on interprovincial differences in expenditure on education, qualitative indicators such as class size and pupil–teacher ratios, spread of information technology, major fields of postsecondary study, sources of income for postsecondary students, and salaries and employment conditions of teaching staff at different levels.

## Growth in full-time enrolment by level of education

The formal learning process may start as early as age 4 with pre-elementary education. Elementary-secondary education is compulsory to at least age 16; the age varies by province. Public education is free until the end of secondary school. (Up to 2002-03, secondary education in Ontario included grade 13; in Quebec elementary-secondary education requires 11 years, but university-bound students must complete a two-year program at a community college—CEGEP).

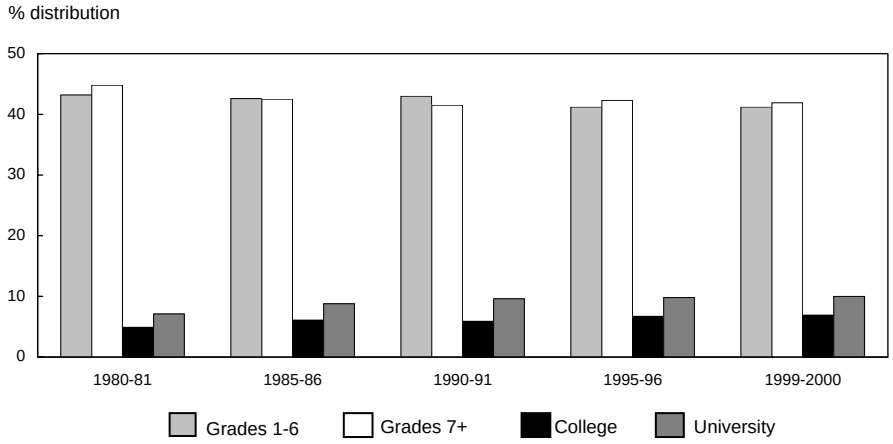
Of Canada's 24.5 million inhabitants in 1980, 5.7 million (23.3%) were enrolled full time at educational institutions. By 1999, the population increased to 30.4 million and full-time enrolment to 6.4 million (21.1%). Although the overall growth in full-time enrolment was only 12.1%, postsecondary institutions saw a 55.7% increase over the period.




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## Full-time enrolment by level of education



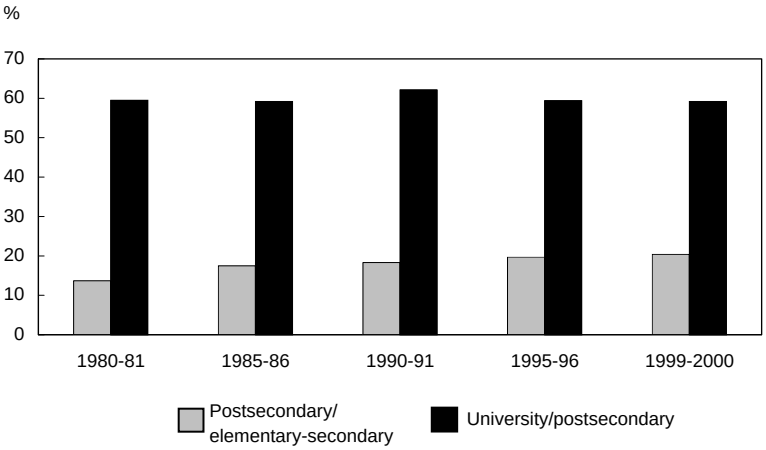

*Note: Pre-elementary is not included.*

Among students enrolled full time at public or private educational institutions (excluding pre-elementary), the proportion attending postsecondary institutions rose steadily, from 12.0% in 1980 to 16.9% in 1999. Universities accounted for 3 of the 5 percentage-point increase and colleges for 2 points. The proportion attending elementary or secondary schools declined between 1980 and 1999, largely because of the drop in the birth rate (1.46% to 1.05%) but also because of an increase in the secondary-school dropout rate.

## Full-time postsecondary enrolment

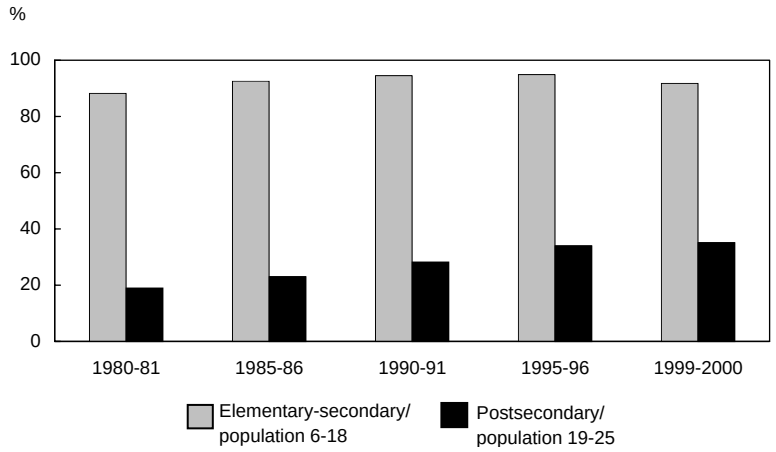
An increasing trend for full-time postsecondary enrolment can also be seen in the rising ratio of postsecondary to elementary-secondary school enrolment—from 14 per 100 in 1980 to 20 per 100 by 1999.

Postsecondary institutions include non-degree-granting community colleges providing trade or vocational programs, and degree-granting universities. Their shares of full-time enrolment did not change much between 1980 and 1999—universities accounted for 60% and colleges the rest.




*Note: Pre-elementary is not included.*

## Full-time enrolment rates for elementary-secondary and postsecondary populations



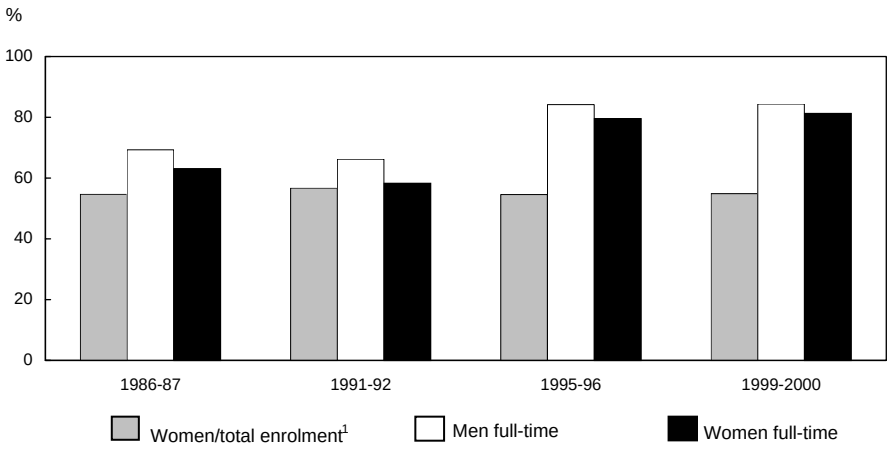

*Note: Pre-elementary is not included.*

A 'participation rate' can be calculated for elementary-secondary (ages 6 to 18) and postsecondary (19 to 25) populations by expressing enrolments as a percentage of their respective populations. As expected, the participation rate for those 6 to 18 enrolled full time at elementary or secondary school fluctuated between 88.2% and 95.5%. The rate will be less than 100% because the upper age limit varies by province, and also because of the dropout rate, which varied over time and by province.

The steadily growing pursuit of postsecondary education is evident in the rising participation rate—in 1980-81, only 19.0% of persons 19 to 25 were enrolled full time at a postsecondary institution compared with 35.1% in the 1999-2000 academic year.

## Community college enrolment

The overall number of students attending community colleges hovered around half a million between 1986 and 1999, with just over half being women. Among both sexes, the proportion enrolled full time rose: from 69.3% to 84.4% for men and from 63.1% to 81.3% for women. Over time, therefore, the difference in the proportions narrowed from 6 to 8 percentage points in the late 1980s to around 3 points in the late 1990s.



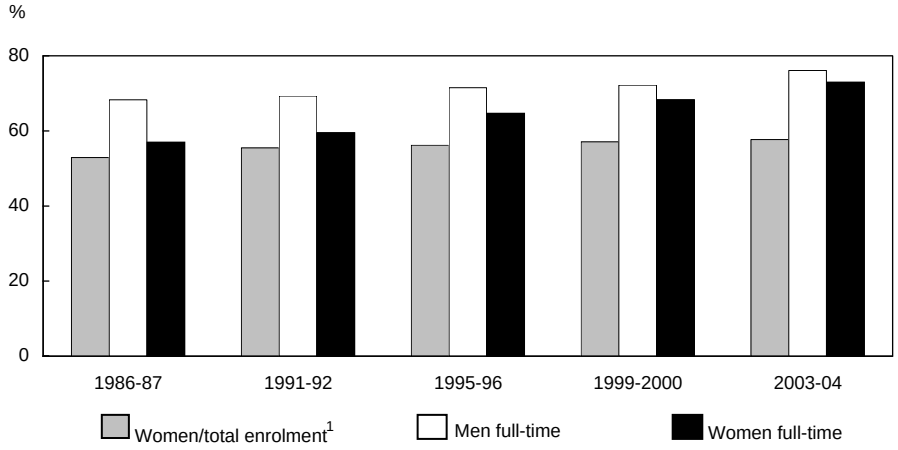

*1 Includes full and part-time enrolment.*

A major reason behind increased full-time enrolment at community colleges is the growing demand for greater skills in a rapidly changing job market. Colleges can generally provide job-oriented skills in less time and at a lower cost than universities.

## University enrolment

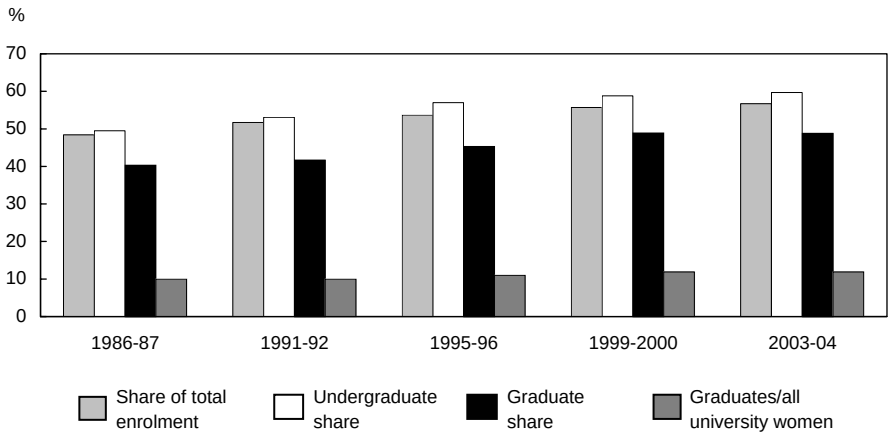
Enrolment at universities increased from 763,000 in 1986 to 990,000 by 2003, with women's representation also rising from 52.9% to 57.7%. Although the majority of both men and women attended university on a full-time basis, the rise in the proportion of women outpaced that of men: from 57.0% to 73.0% for women and from 68.3% to 76.1% for men. Similar trends were seen for community and technical colleges.

Among those enrolled at a university, 87.8% were in undergraduate programs in 1986 compared with 85.7% in 2003, indicating a slight increase in the proportion of those taking graduate programs.




*1 Includes full and part-time enrolment.*

## Women's representation in full-time university enrolment

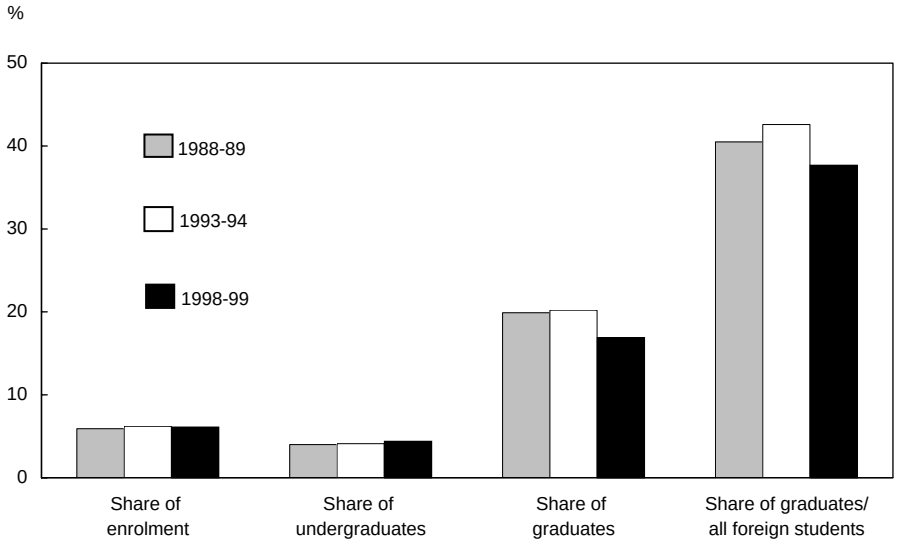



Between 1986 and 2003, women's representation among undergraduates increased from 49.5% to 59.7%, and among graduates from 40.3% to 48.8%. On the other hand, the proportion of men and women enrolled for a graduate degree did not vary much over the years, staying around 10% to 12% for women and 15% to 17% for men.

## Foreign student representation in full-time university enrolment

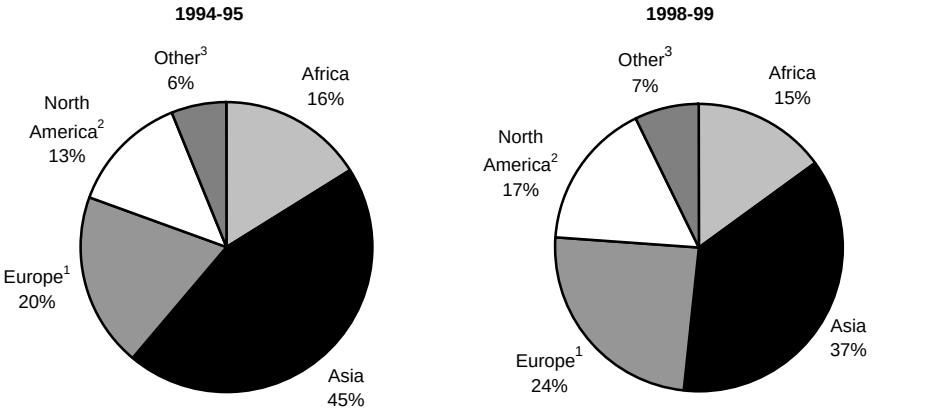
Many foreign students from developing countries come to Canada to pursue higher education. Some receive public funds from their own country or through Canadian assistance programs, while others rely on private or personal means.

Between 1988 and 1998, full-time foreign student enrolment at Canadian universities grew from 31,000 to 37,000 of a total respective enrolment of 532,000 and 580,000. The proportion of foreign students among those enrolled full time has remained around 6%. Their representation, however, varied considerably by level—around 4% among undergraduates but between 17% and 23% among graduates.




Four in 10 foreign students attended a graduate program. Between 1988 and 1998, the proportion of foreign students among graduates peaked at 23.3% in the 1990-91 academic year, after which it dropped steadily—largely because of steadily rising tuition fees for foreign students pursuing advanced degrees.

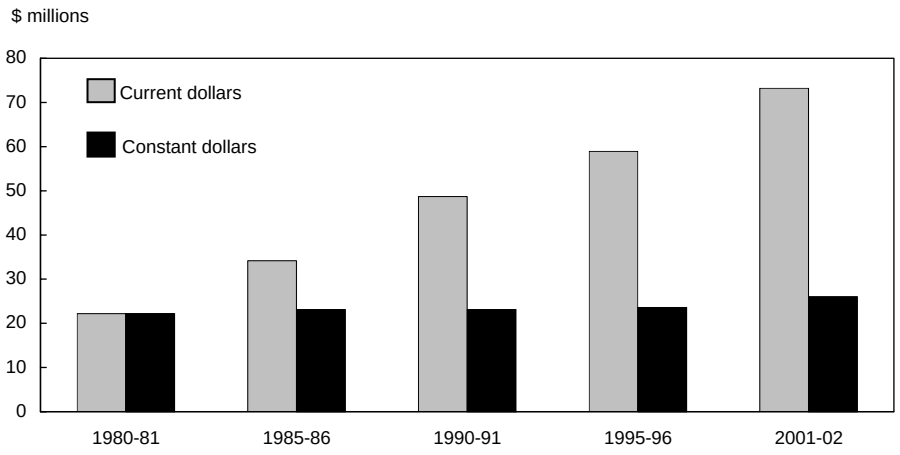
## Full-time foreign students by country of origin




*1 Includes Russia.*
*2 Includes Central America and the Caribbean.*
*3 South America, Oceania, stateless, and not reported.*

The distribution of foreign students by country of origin changed slightly between 1994-95 and 1998-99 academic years. In 1994-95, 44.9% of all foreign students came from Asian countries and 19.6% from Europe. By 1998-99, the proportions were 36.7% and 24.3%. At the same time, a slight increase was seen in the proportion from North American countries (including Central America and the Caribbean).

## Total expenditure on education

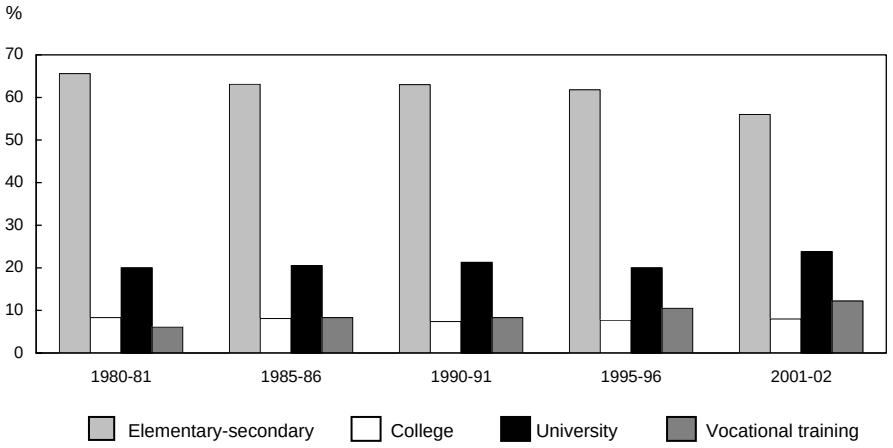



In total, Canada spent $73.2 billion on education in the 2001-02 academic year compared with $22.2 billion in 1980-81. However, adjusting for inflation (using the change in the consumer price index), the difference dropped to just $3.8 billion as the 2001-02 expenditure became $26 billion in 1980 dollars. In other words, 92.5% of the increase in total education expenditure between 1980 and 2001 was due to inflation and the rest to other factors (such as more instructors, services and materials, and infrastructure). Since most education expenses are sensitive to inflation—wages and salaries, goods and services, and capital outlays—this result is not unexpected.

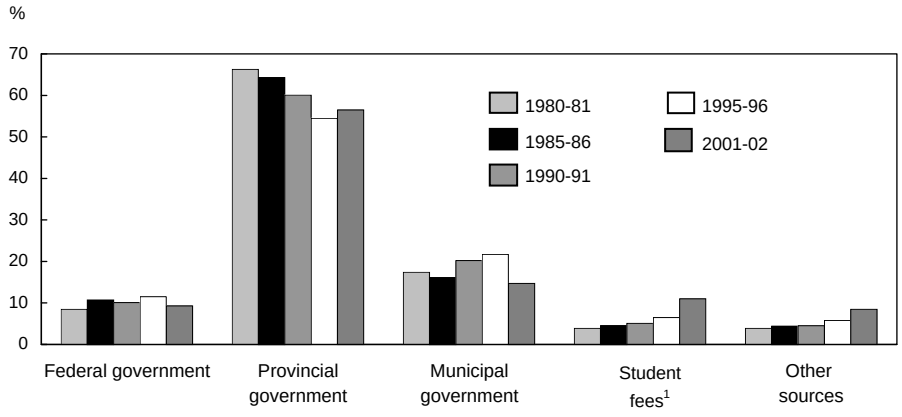
## Share of expenditure on education by level

The distribution of education spending by type of institution has changed over the last two decades. In the 1980-81 academic year, 66 cents of each dollar went to elementary and secondary schools, 8 cents to colleges, 20 cents to universities, and 6 cents to trade and vocational training. By 2001-02, spending on schools was reduced by 10 cents, while 4 cents went to universities and 6 cents to vocational training.

The elementary-secondary school drop resulted from falling enrolment and restructuring or closings, largely due to the declining birth rate. The increase for universities and trade or vocational programs can be attributed to growing demand for higher education and career-oriented trade skills—the latter necessitated by the changing labour market, globalization, international competitive forces, and other socio-economic factors.




## Share of expenditure on education by source of funding




*1 Student fees include tuition fees plus additional compulsory fees such as those for recreation and athletics, student health services, and student associations.*

Education is funded by all three levels of government, student fees and private sources including bequests, donations, non-government grants, investment income, and borrowings. Since the provision of education in Canada is a provincial/territorial responsibility, most of the funding comes from this level: 66.3% in 1980-81 and 56.5% in 2001-02. The provincial share peaked at 68.4% in 1982-83. Federal spending remained between 8.2% and 11.5% over the period.

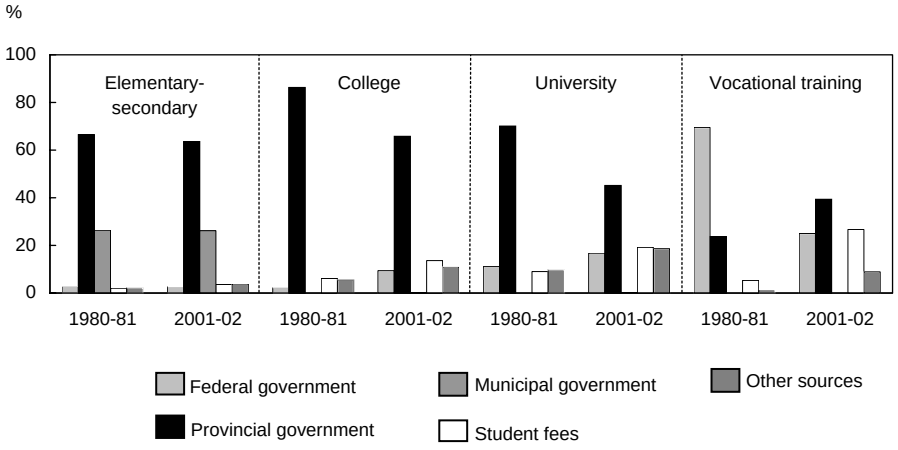
Some shift to private sources has occurred over the last two decades—in 2001, 80.5% of funding was public compared with 92.2% in 1980. This 12 percentage-point drop was offset by an increase of 7 points in direct student fees, and another 5 from private sources.

## Source of funding

Funding sources vary by type of institution. Public funds (money directly spent by the three levels of government) were the major source of financing at all levels.

Elementary-secondary schools spent $41.0 billion in 2001 compared with $14.6 billion in 1980. Almost all of this was publicly funded (93% to 96%), with provincial governments accounting for two-thirds. Community college expenditures rose from $1.8 billion to $5.8 billion, but the share financed through public funds (from federal and, mainly, provincial governments) fell from 88.5% to 75.3%. This shortfall shifted the burden more to students than to other private means; the share of student fees went from 6.1% to 13.6%.

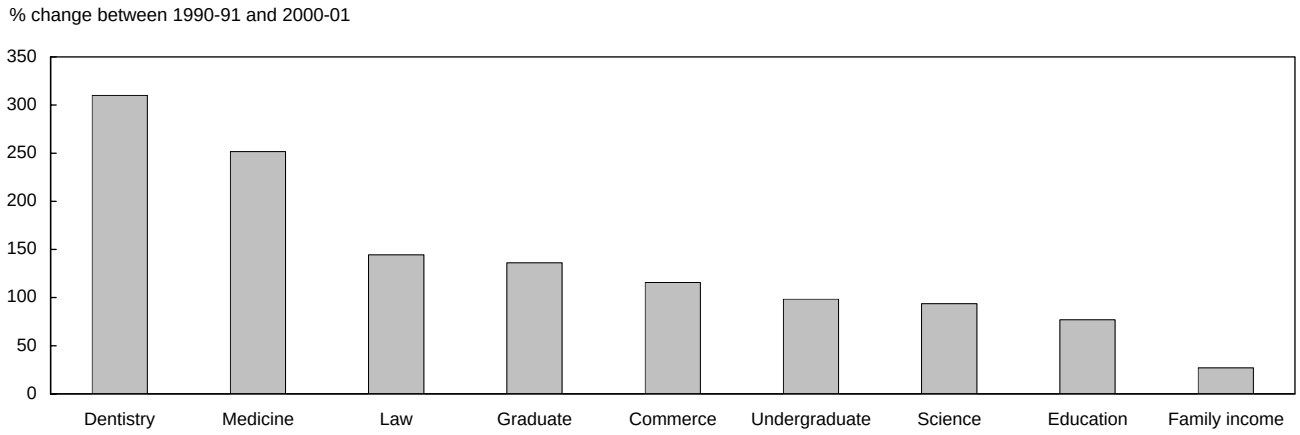
University spending quadrupled ($4.4 billion to $17.5 billion) between 1980 and 2001. The




provincial share fell from 70.1% to 45.2%, while the federal share rose from 11.1% to 16.7%. The increased federal share went toward more sponsored research and development since such funds are not generally used for operating costs. Over the last two decades, universities have doubled their financial dependence on private sources, such as donations and non-government support (from 9.8% to 18.6%) and student fees (from 9.0% to 19.2%).

Spending on trade/vocational training crept up from $1.3 billion in 1980 to $8.9 billion in 2001. The federal share fell from 69.5% to 25.0% as the provinces increased their funding (from 23.7% to 39.4%) and student fees rose (5.3% to 26.7%).

## Change in average family income and tuition fees for selected university faculties



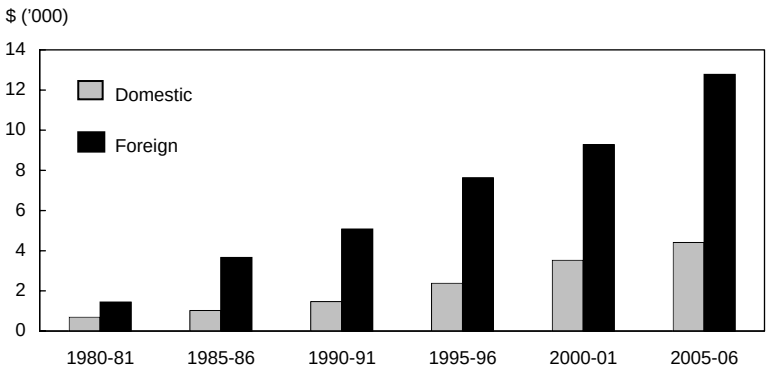

*Note: All money data are in 2001 dollars.*

Between 1990-91 and 2000-01, increases in university fees greatly exceeded the growth in family incomes—in 2001 dollars, average pre-tax family income increased by 27% whereas fees for undergraduate programs rose by 99% and graduate programs by 136%. Fees went up 310% for dental schools, followed by 252% for medical schools, 144% for law schools, and 94% for science programs.

Rising fees may dampen enrolment or create economic hardship for those keen to advance their education and skills at a university.

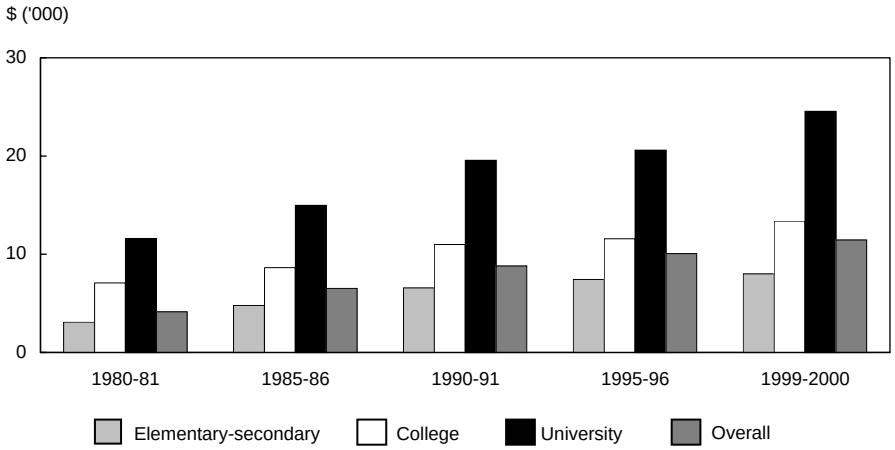
## Weighted average university tuition fees for full-time domestic and foreign students

Foreign students typically pay two to three times the fees paid by domestic students, whether for undergraduate or graduate programs. In the 1980-81 academic year, the weighted average tuition fee paid by full-time foreign students was $1,400 whereas their domestic counterparts paid $700; by 2005-06, the respective fees were $12,800 and $4,400—jumps of 8.8 times and 6.3 times. High fees for foreign students may have contributed to their declining enrolment at Canadian universities.




*Note: All money data are in current dollars.*

## Average education expenditure per full-time student



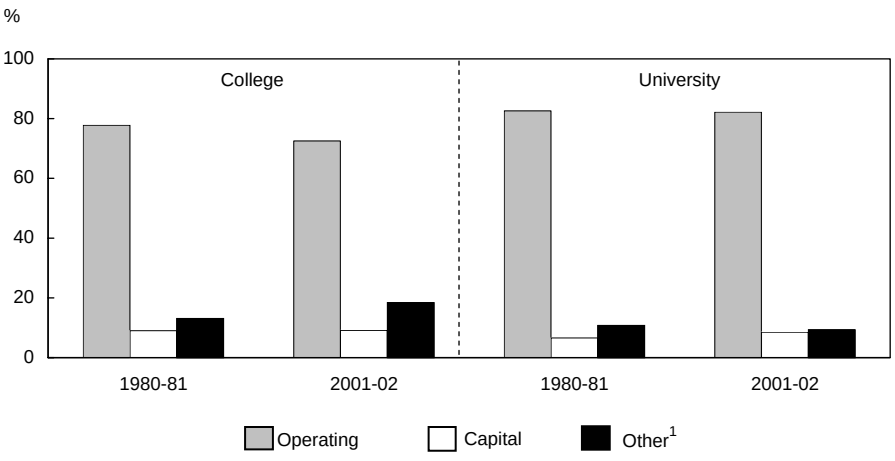

*Note: All money data are in current dollars.*

Compared with elementary-secondary school, the average expenditure per full-time student nearly doubles at college and triples at university. These ratios remained almost unchanged between 1980 and 1999.

Over the period, the cost per full-time student escalated from $3,100 to $8,000 for elementary-secondary schools, from $7,100 to $13,400 for colleges, and from $11,600 to $24,500 for universities.

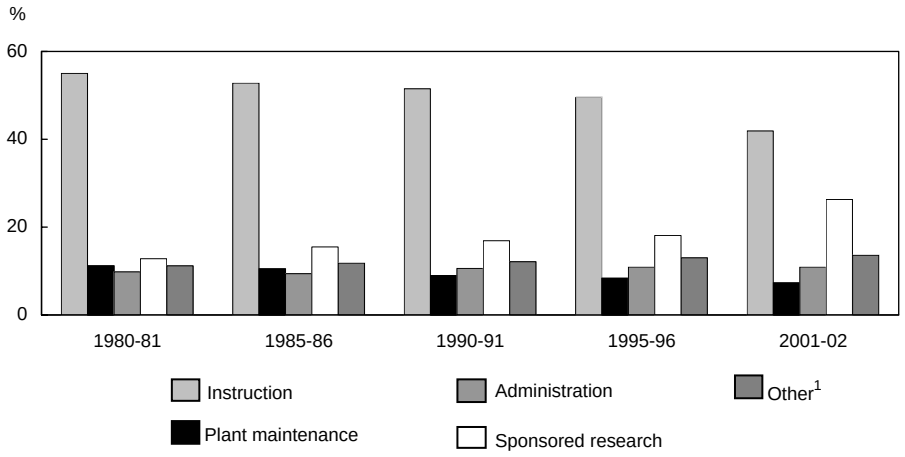
## Disbursement of total education expenditure for colleges and universities

During both the 1980-81 and 2001-02 academic years, the lion's share of the expenditure dollar went to cover operating costs—between 72 and 78 cents for colleges and about 83 cents for universities. For both, the second largest component was student support and other departmental expenditures (excluding capital outlays), with colleges spending relatively more (between 13 and 18 cents) than universities (between 9 and 11 cents). The remainder was spent on capital outlays.




*1 Student support and other departmental expenditure*

## Components of university operating expenditures




*1 Includes libraries, student services, and other unspecified expenditures.*

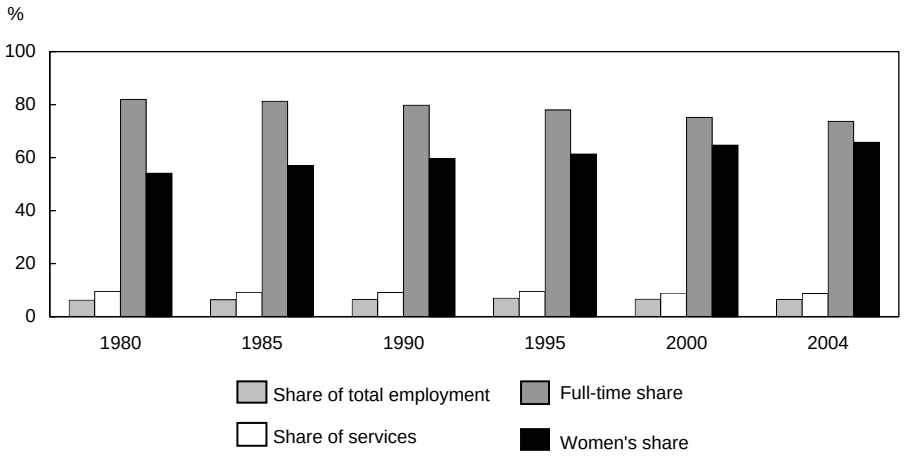
For universities, expenditure on instruction (wages and salaries of teaching staff and supplementary labour costs) accounted for 55.0% of operating costs in the 1980-81 academic year. This was followed by 11.2% for plant maintenance, 9.8% for administration, and 12.8% for sponsored research.

The remaining 11.2% went for libraries, student services, scholarships, and other expenses. By 2001-02, the share spent on sponsored research had risen (to 26.3%) while all other components fell—instruction by 13.1 percentage points.

Undertaking and spending more on sponsored research may qualify universities to receive more federal funding. Spending less on instruction may mean a reduction in permanent teaching staff; larger class sizes; the hiring of temporary, contract, or part-time staff; and more use of teaching aids.

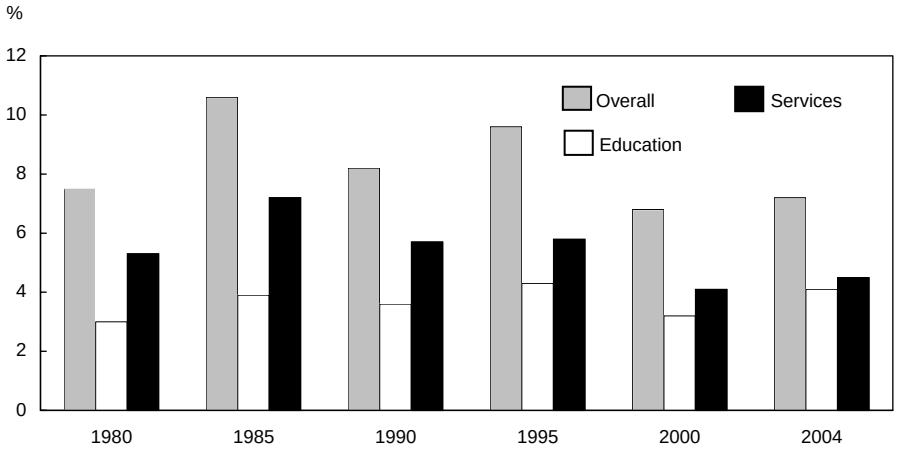
## Employment in educational services

Between 1980 and 2004, total employment grew from 11 million to 16 million, and educational services employment from 695,000 to 1,038,000, keeping the proportion employed in the educational services industry at 6% to 7%. Overall service employment grew from 7 million to 12 million, leaving educational services at 9% of total services.




The proportion employed full time in educational services has been sliding—from 82% in 1980 to 74% in 2004 (one factor responsible for reduced expenditure on instruction). At the same time, women have increased their representation—from one-half to two-thirds of employment in educational services.

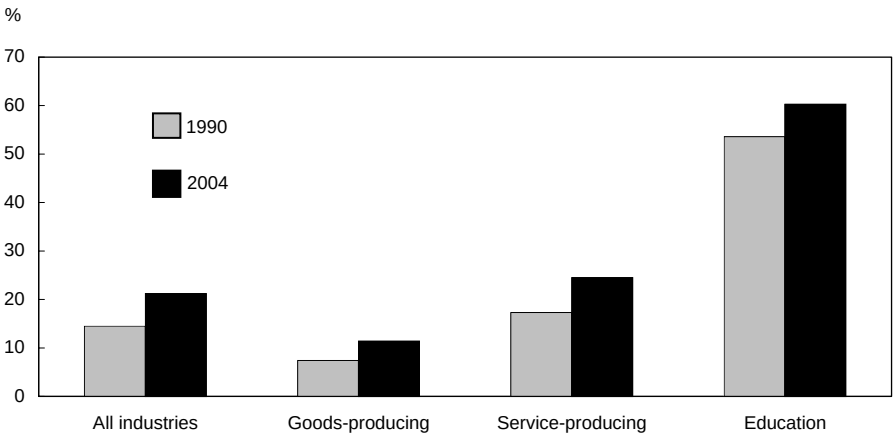
## Unemployment rate in educational services



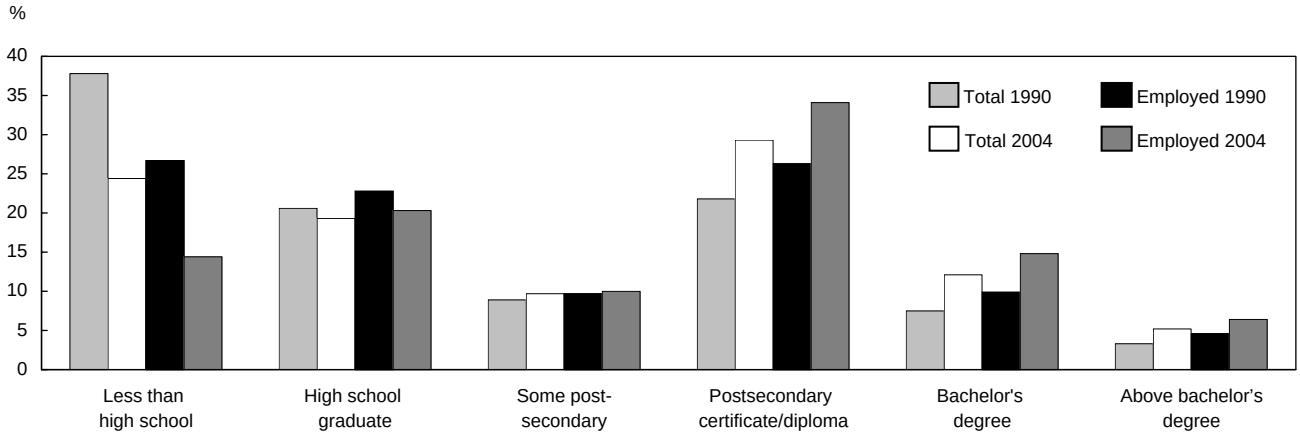

Generally, higher levels of education and skills are associated with lower unemployment. Those employed in educational services, who have relatively higher levels of education (see chart below), had an unemployment rate much lower than the rate for all services or all industries. Between 1980 and 2004, the overall unemployment rate fluctuated between 6.8% and 12.0%, while in educational services, it varied between 3.0% and 4.6%.

## Percentage of employed with a university degree

Since the majority employed in educational services are teachers, they are likely to have higher levels of education—for many, a university degree may be an entry requirement. Some 60.3% had a university degree in 2004 compared with 53.6% in 1990—the corresponding proportions for the overall service-producing sector were 24.5% and 17.3%; for goods-producing, 11.4% and 7.4%. Among employed persons generally, the proportion with a university degree rose from 14.5% to 21.2% over the period.



## Population and employed 15 and over by level of education

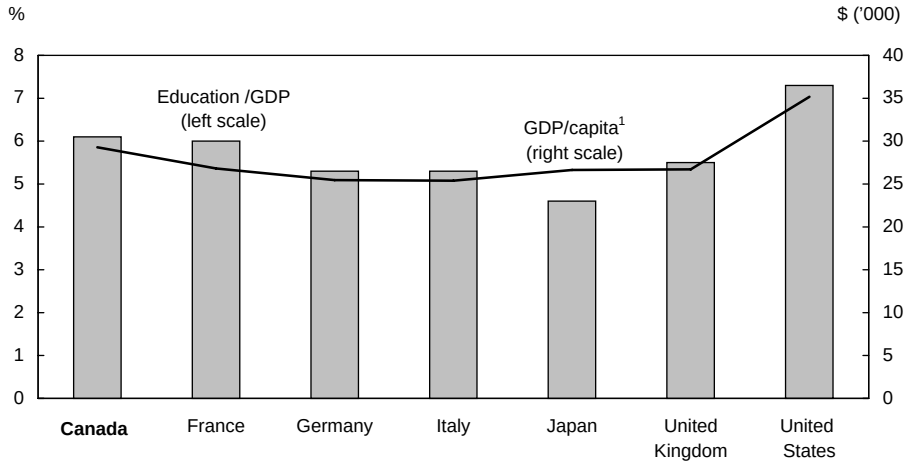



Educational attainment can be used as a crude proxy for the stock of human capital (the knowledge and skills that people acquire). In the general population, the proportion that had completed postsecondary education increased from 32.6% in 1990 to 46.6% in 2004; the proportion with a university degree increased from one-tenth to one-sixth over this period.

Among the employed, the shifts by education were more noticeable: 55.3% had completed postsecondary education in 2004 compared with 40.8% in 1990. Although the proportion with a bachelor's degree increased by 5 percentage points (from 9.9% to 14.8%), the proportion with credentials above a bachelor's degree inched up by less than 2 points (4.6% to 6.4%).

Factors responsible for this improvement in human capital may include government initiatives to promote higher education, the desire to maintain Canada's social and economic competitiveness with other advanced nations, the labour market seeking more skilled persons, and changing demographics (for example, population aging, more immigration).

## Education expenditure as a percentage of GDP for G-7 countries, 2001



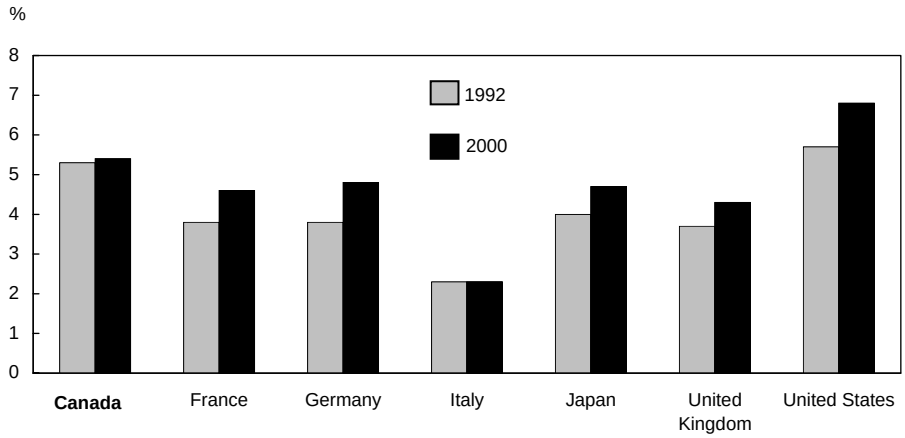

*1 Based on purchasing power parity in US 2001 dollars.*

Among G-7 countries, Canada ranked second only to the United States in respect to spending on education. In 2001, expenditure on education was 6.1% of GDP compared with 7.3% in the United States and 4.6% in Japan.

Countries with higher GDP per capita spent a relatively larger share of GDP on education as well. The top four countries, ranked on the basis of these two ratios, were the United States, Canada, France and the United Kingdom. The remaining three G-7 countries showed a different pattern; for example, Japan, which ranked fifth on the basis of GDP per capita, was at the bottom in terms of GDP spent on education.

(GDP per capita is commonly used to compare living standards internationally. The ratio is based on purchasing power parity, which reflects the equivalent national currency needed to buy the same basket of goods that one US dollar will buy in the United States.)

## Investment in knowledge as a percentage of GDP for G-7 countries




Knowledge can be gained not only through formal education but also through research and development activity and day-to-day job experience. Accordingly, it may be more meaningful to compare countries in terms of investment in knowledge rather than just formal education. Investment in knowledge includes spending on public and private higher education, research and development, and software. The importance a country places on knowledge can be gauged by its investment in knowledge expressed as a percentage of GDP.

Based on this ratio, Canada again ranked second only to the United States in both 1992 and 2000. Over this period, Canada's ratio barely changed (from 5.3% to 5.4%) while the U.S.'s climbed from 5.7% to 6.8%. Japan, which ranked at the bottom with respect to expenditure on education, ranked third in 1992 and fourth in 2000 in expenditure on knowledge. Japan, like the United States and Canada, has been putting emphasis on research and development activities as well as on developing software. On the other hand, the United Kingdom, which ranked fourth both in expenditure on formal education and per capita income, ranked sixth in investment in knowledge.

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