

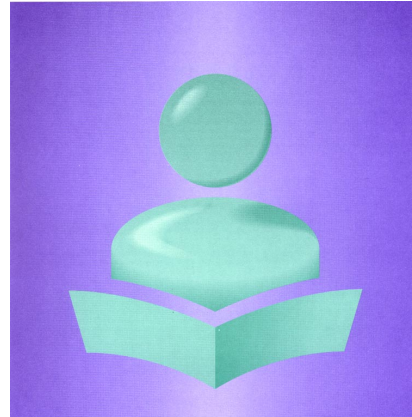


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Education Quarterly Review

2001, Vol. 7, no. 3

- Women in engineering
- 100 years of education
- Arts and culture graduates



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Statistics Canada
Culture, Tourism and the Centre for Education Statistics

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From the

Editor-in-Chief

Mission

Education Quarterly Review analyses and reports on current issues and trends in education using information from a variety of statistical sources. It serves as a focal point for education statistics and provides a forum for communication with stakeholders and the public. Our goal is to present information and analysis that are relevant, authoritative, timely and accessible.

A century of change within Canada—growth in some sectors, decline in others—has altered the landscape of Canadian education in dramatic ways. Critical events, particularly World War II, the 1930s economic depression and the shift from land-based occupations to the so-called “knowledge society” have throughout the 1900s impacted school enrolment trends, participation rates and the financing of education programs. Warren Clark’s article details these and other trends in Canadian education, including the participation of women in postsecondary education, rising from one in four in the middle years of the 20th century to more than half by the end of the 1990s.

While today more than 50% of university students are women, they remain under-represented in several professions including engineering. Finnie, Lavoie and Rivard examine this issue using data from the National Graduates Surveys. The results of this analysis indicate that with respect to standard labour market outcomes such as employment and earnings overall “... women engineers do relatively well ... especially as compared to women in other professions ...”, but that the root of women’s low representation in engineering lies elsewhere.

One area of postsecondary education in which women dramatically outnumber men is in the arts and culture field. Jackie Luffman concludes that women represent nearly 7 in 10 culture graduates at the university level. However, culture graduates have higher than average rates of self-employment compared to the labour force in general, lower than average wages, a higher probability of working part time and a lower probability of finding employment in their chosen field.

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The Centre for Education Statistics is accessible toll-free from anywhere in Canada at 1 800 307-3382.

In addition to these papers, please refer to the **Cumulative index** at the back of the report, where we list by title all articles that have appeared in *EQR* since 1994. These articles have been grouped under 11 categories, including 'Education funding,' 'Technology and learning' and 'Accessibility.' These categories are based on

education policy issues that were identified in the Centre for Education Statistics *Strategic Plan*, which reviews the Centre's statistical program and identifies objectives and priorities required to strengthen the program to better address information needs. The *Strategic Plan* is available free of charge at www.statcan.ca/cgi-bin/downpub/freepub.cgi on the Internet.



Highlights



Women in engineering

- In 1982, women made up slightly more than half of all graduates with bachelor's degrees; their share reached 60% in 1995. The representation of women increased in all fields, but nowhere was it more pronounced than in engineering, where the share of female graduates more than doubled between 1982 and 1995.
- However, engineering remains a much more popular choice for men than for women, although the proportion of female engineering graduates was slightly higher in 1995 than in 1982 (2.3% versus 1.7%); men's proportions for the same years were 13.1% and 16.5%, respectively. The increased share of female engineering graduates was principally due to a rise in the number of female graduates overall, not to any great shift of women toward engineering programs.
- Among the fields of study examined, engineering graduates—both men and women—had higher than average earnings. Engineering has consistently been the highest paying field of study for men. For women, it was also the highest paying in all periods except 1984 and 1987, when women with pure science diplomas earned more.
- Substantially more female than male engineering graduates have been employed on a temporary basis. Between 9.8% and 12.6% of male engineers held temporary jobs at the first interview, compared with between 21.1% and 27.3% of female engineers.

100 years of education

- In the postwar period, elementary-school enrolment increased faster in Canada than in any other industrialized country. Rising expectations, the widespread belief in education as a means of upward mobility, and rising affluence encouraged students to stay in school longer.
- Governments increased expenditures on education to 8% of GDP at its peak in 1992. In 1997, Canada ranked among the world's educational leaders, with spending on education as a proportion of GDP second only to the United States among G7 countries.

- By 1989, there were more women enrolled full time at Canadian universities than men, and the percentage of women had continued to grow into the late 1990s. Women have made major gains in law and medicine, where they now represent about half of the first professional degrees granted; in 1950, only 4% of law and 5% of medical degrees were granted to women.
- Close to 25% of all university graduates, including 26% from culture studies, returned to school between 1992 and 1995. College, trade and vocational culture graduates were less likely to go back to school (only 20%) than university arts and culture graduates.

Arts and culture graduates

- Two and five years after graduation, culture graduates were more likely than other graduates to be moonlighting, be self-employed, have changed employers or have found temporary work.
- In 1995 university culture graduates from the class of 1990 earned, on average, only \$30,500 compared to the entire class of university level graduates who earned, on average, \$39,150.
- About 33% of university culture graduates indicated their job was directly related, compared with 41% for other graduates. Similarly, 40% of trade, vocational and college culture graduates indicated their job was directly related to their training, compared with 51% for other graduates. EQR

Articles

Women in engineering: The missing link in the Canadian knowledge economy

Abstract

The current move toward a ‘knowledge-based economy’ implies a greater dependence on state-of-the-art technology. If Canada is to remain at the forefront of critical technologies, which depend largely on the efforts of engineers, there will have to be substantial growth in the number of engineers working in this country.

Attracting more women into engineering programs, where they are still greatly underrepresented, could constitute an important source of these needed professionals. In this report, data on three cohorts of recent graduates are used to investigate whether unsatisfactory labour market outcomes are a significant factor behind women’s underrepresentation in engineering programs. Generally, the results indicate that female engineers do relatively well in the labour market—especially compared with women in other fields of study.

Introduction

The current move toward a ‘knowledge-based economy’ implies a greater dependence on state-of-the-art technology. Engineers are among the main participants in the innovation process, so they will have an increasing impact on the nation’s economic performance.¹ In particular, if Canada is to remain at the technology frontier, there needs to be substantial growth in the number of engineers educated and working in the country. This is of special concern in the present context, where issues like the ‘brain drain’ and skills shortages, particularly in the science and technology sectors, attract media attention.

Attracting more women into engineering programs, where they have traditionally been greatly underrepresented, might be one significant way to increase the number of engineering graduates. Even though women increasingly outperform men at all levels of schooling, and women are more likely than men to complete high school and now constitute the majority of university undergraduates, very little is known about the causes of women’s reluctance to enter the engineering profession.²

This report was written by Ross Finnie, Marie Lavoie and Maud-Catherine Rivard. Ross Finnie is with the School of Policy Studies at Queen’s University and a Visiting Fellow at Statistics Canada. Marie Lavoie is with the Department of Economics at Glendon College, York University. Maud-Catherine Rivard, who was at Statistics Canada when this report was written, is now at Finance Canada.

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This reluctance is not exclusively a Canadian phenomenon. Most other countries face the same situation, despite efforts by universities, governments and professional associations to increase female participation in the profession. In this context, the goal of this report is to shed new light on women's experiences in the engineering profession and to offer some explanations for their low representation in engineering in Canada.

Among the various possible reasons—inadequate academic preparation in grade school and high school, sexist school and work environments, lack of role models, and so forth—we investigate whether unsatisfactory labour market outcomes could account for the relatively small number of women in engineering. More specifically, using data from four waves of the National Graduates Surveys (NGS), we compare the employment situation, earnings levels and various satisfaction measures of women with a recent bachelor's degree in engineering with those of women in other fields of study and with those of men in engineering. We also document the share of master's and PhD degrees granted to women across different fields of study and compare the earnings of such degree holders by sex and field of study.

Our results indicate that, at the bachelor's level, female engineers generally enjoy an advantage over women in other fields of study in terms of employment and earnings. Furthermore, engineering is one of the better fields for women because the earnings gap between the sexes (especially five years after graduation) is narrow, though women in engineering are more likely to hold temporary jobs than their male counterparts. Women with engineering degrees have also been more satisfied with their education programs and have had closer job skills–education matches than other women. On the other hand, we found that, generally, there were no significant differences by sex or field of study in terms of earnings or job satisfaction. Finally, although the proportion of women who go on to higher degrees in engineering is very low and their earnings are average at best, these women enjoy faster earnings growth than do other women with higher-level degrees. Therefore, any argument that poor performance in the labour market is at the root of the low representation of women in engineering is generally not supported by the data. This suggests that policy makers should look to other explanations of the problem.

The data

This research exploits data from the National Graduates Surveys (NGS)—large, representative samples of university graduates who completed their programs in 1982, 1986, 1990 and 1995—and focuses on the educational experiences and early labour market outcomes of

these graduates. The NGS gather demographic information and data on the employment situation and earnings of recent graduates, as well as some less conventional data relating to issues such as satisfaction with the job and education program. In addition, since each cohort was interviewed two and five years after graduation (except the 1995 graduates, who were re-interviewed only in 2000³), the NGS provide a dynamic perspective of recent graduates' movements into the labour market.

Most of the analysis in this report focuses on the labour market outcomes of bachelor's graduates. We also investigate certain outcomes for master's and PhD graduates, but our analysis is somewhat constrained by the relatively small number of female engineering graduates at those levels.⁴

Individuals who earned an additional degree after the indicated graduation date were excluded from our working samples on the grounds that they no longer belonged to the original education cohort and could not be interviewed at the same points in time following graduation. Also excluded were those who worked only part time because they were attending school. The rationale for the latter exclusion is that their mixing of school and work would likely affect the labour market outcomes we were investigating. Finally, earnings figures are presented only for full-time workers with annual earnings greater than \$5,000 in order to extrapolate from the effects of labour supply decisions on this outcome.

We classified graduates into four groups according to their field of study: engineering; pure science (mathematics, physics, chemistry); applied science (agriculture, biology, health sciences); and social science and humanities (all other fields).

The outcome variables we analysed were as follows: the unemployment rate and share of part-time and temporary workers; the annual rate of pay; satisfaction with respect to the job, education program and earnings; and the job skills–education match. We derived the job skills–education match index and the satisfaction measures from the categorical responses provided in the NGS databases (on a scale of 0 to 100, with 100 indicating the best match or greatest satisfaction level). The details on how these measures were constructed appear in the Appendix.

Findings

The distribution of graduates by sex and field of study

In 1982, women made up slightly more than half of all graduates with bachelor's degrees; their share reached 60% in 1995 (see Table 1). The representation of women



Table 1
Distribution of bachelor's graduates, by field of study

	1982 Cohort			1986 Cohort			1990 Cohort			1995 Cohort		
	Share ¹ of women	Distribution ² of men	Distribution of women	Share of women	Distribution of men	Distribution of women	Share of women	Distribution of men	Distribution of women	Share of women	Distribution of men	Distribution of women
	%											
All	53.0	47.0	53.0	55.0	44.7	55.3	56.0	43.9	56.1	60.0	39.6	60.4
Social sciences and humanities	58.0	63.4	79.3	61.0	61.5	77.9	61.0	65.5	78.9	64.0	67.6	79.2
Pure sciences	27.0	9.0	3.1	32.0	11.8	4.5	30.0	9.5	3.2	32.0	9.4	2.8
Applied sciences	61.0	11.2	16.0	64.0	10.8	15.7	65.0	11.0	16.1	71.0	9.9	15.7
Engineering	10.0	16.5	1.7	13.0	15.9	1.9	15.0	13.9	1.9	21.0	13.1	2.3

Notes:

1. 'Share of women' expresses women as a percentage of all graduates in each field of study.

2. 'Distribution' refers to the percentage of all male or all female graduates in each field of study for a given cohort.

Source: National Graduates Surveys.

increased in all fields, but nowhere was it more pronounced than in engineering, where the share of female graduates more than doubled between 1982 and 1995. This is, of course, quite encouraging for the future supply of these specific science and technology graduates. However, in 1995, women still accounted for only 21% of engineering graduates—by far the lowest percentage in any field of study.⁵

Although a greater share of bachelor's diplomas has been awarded to women in recent years, the distribution of these diplomas by sex of graduates across fields of study has remained fairly stable over time. The social science and humanities group continues to attract the large majority of women. Engineering remains a much more popular choice for men than for women, although the proportion of female engineering graduates was slightly higher in 1995 than in 1982 (2.3% versus 1.7%); men's proportions for the same years were 13.1% and 16.5%, respectively. The increased share of female engineering graduates was principally due to a rise in the number of female graduates overall, not to any great shift of women toward engineering programs.

In short, engineering programs were only marginally successful in attracting a greater share of the rising number of female bachelor's students over time. Why is this so?

Earnings

The engineering profession, like others, is shaped by many social forces and by more narrow economic ones. It is beyond the scope of this report—principally because of the corresponding limitations of the NGS databases—to address the social forces. Instead, we focus on the economic

ones by looking at various labour market outcomes of female engineering graduates over the last couple of decades. We begin with the most pertinent,⁶ their earnings patterns.

Are the prospects for female engineers so unattractive as to account for their low representation in the profession? We begin our analysis by comparing the earnings of women with recent engineering degrees with those of male graduates and with those of other women.

Average earnings for the graduates of all fields of study taken together remained relatively stable between 1982 and 1990. See Table 2 for the constant 1997 dollar figures.⁷ The most recent cohort's average earnings are considerably lower. However, the earnings question was changed in 1995, so it is impossible to tell whether this is due to less favourable economic conditions for 1995 graduates or to the different way earnings were reported.⁸

On average, women were earning somewhat less than men two years after graduation. By the second interview, the gap had increased considerably, especially for the 1982 and 1990 cohorts. A variety of factors—such as sex differences in chances for promotion, segregation of women within the less lucrative areas of their profession, and their generally weaker attachment to the labour market, especially in the childbearing years—might explain the growing disparity in earnings.

Among the fields of study we examined, engineering graduates—both men and women—had higher than average earnings. Engineering has consistently been the highest paying field of study for men. For women, it was also the highest paying in all periods except 1984 and 1987, when women with pure science diplomas earned more. A comparison of relative earnings across fields of study thus



Table 2
Average earnings,¹ by field of study

	1982 Cohort			1986 Cohort			1990 Cohort			1995 Cohort
	1984	1987	Growth	1988	1991	Growth	1992	1995	Growth	1997
	\$		%	\$		%	\$		%	\$
All (no physicians)										
Men	37,500	45,800	22.1	37,500	44,200	17.9	36,300	43,600	20.1	31,700
Women	33,400	38,300	14.7	34,000	39,400	15.9	34,100	38,800	13.8	27,300
Earnings ratio: women/men (%)	0.89	0.84		0.91	0.89		0.94	0.89		0.86
Social sciences and humanities										
Men	36,500	45,100	23.6	37,800	43,400	14.8	35,400	42,500	20.1	30,500
Women	32,600	37,800	16.0	34,000	39,000	14.7	33,500	38,200	14.0	26,600
Earnings ratio: women/men (%)	0.89	0.84		0.90	0.90		0.95	0.90		0.87
Pure sciences										
Men	39,400	47,300	20.1	36,400	45,200	24.2	38,000	46,100	21.3	34,700
Women	37,100	43,800	18.1	35,000	42,100	20.3	34,000	40,800	20.0	30,700
Earnings ratio: women/men (%)	0.94	0.93		0.96	0.93		0.89	0.89		0.88
Applied sciences (no physicians)										
Men	34,400	44,900	30.5	35,000	44,000	25.7	35,100	43,000	22.5	29,300
Women	35,900	39,500	10.0	35,800	40,500	13.1	36,600	41,000	12.0	29,700
Earnings ratio: women/men (%)	1.04	0.88		1.02	0.92		1.04	0.95		1.01
Engineering										
Men	40,500	47,800	18.0	38,400	46,300	20.6	39,100	47,000	20.2	35,400
Women	36,300	42,400	16.8	36,400	43,000	18.1	38,600	43,700	13.2	30,900
Earnings ratio: women/men (%)	0.90	0.89		0.95	0.93		0.99	0.93		0.87

Notes:

In this table, the samples exclude graduates who had completed another degree and those who were working part time because of school. Samples are restricted to those working full time for earnings greater than \$5,000.

1. Constant 1997 dollars.

Source: National Graduates Surveys.

points to an advantage to entering the engineering profession—one that is almost as strong for women as for men.

On the other hand, our figures also show that, despite taking home among the highest salaries at any point in time, female engineers' earnings have not generally grown as fast as those of pure science graduates, whose salary growth was the largest among all the fields of study we examined. In the longer run, then, the earnings prospects of female engineers might not be as advantageous as they are immediately after graduation—a potentially important finding.

A comparison of women's and men's earnings—the earnings gap between the sexes—across fields of study shows that engineering graduates placed second or third in this respect as of the first interview, lagging behind applied science graduates and pure science graduates. At the time of the second interview, however, the earnings ratio in engineering compared advantageously to that observed in all other fields. The figures suggest that this catching up

reflects the generally low growth rates of male engineers' earnings, rather than any particular advantage for female engineers.

However, this somewhat simplifies the relevant issues, since it is the salaries available at the individual level in engineering versus other fields that should actually matter; the average earnings of those who happen to enter one field or another are themselves determined by the relative earnings opportunities. That is, the women who choose engineering are probably more able, on average, than their more numerous male peers, since the market is selecting a smaller fraction of the available supply of qualified entrants. This might make us expect women engineers to do better than others. Addressing this issue—a classic case of the 'selection problem'—is generally challenging. The data available to us here make it especially challenging; it remains beyond the scope of our report, which has a more modest goal of describing the labour market and the related outcomes of recent graduates.⁹

Employment status

We compare various measures of satisfaction and labour force attachment among engineers and non-engineers of both sexes in Table 3. The table's top panel reports unemployment rates. For the 1982, 1986 and 1995 cohorts of graduates, the unemployment rate of women in engineering was substantially lower two years after graduation than that of women from other fields of study. Moreover, for all cohorts, women in engineering had much lower unemployment rates than men at the first interview.

However, they were always more likely to be unemployed than their male counterparts at the second interview. Thus, the advantage female engineers enjoy in terms of relatively low unemployment in the first years following graduation seems to be short-lived. As well, the unemployment figures for engineers who graduated in 1990, both male and female, were at odds with those of the other cohorts: engineering graduates were particularly hard hit by the recession in the early 1990s and experienced unusually high unemployment rates in 1992.

		1982 Cohort		1986 Cohort		1990 Cohort		1995 Cohort
		1984	1987	1988	1991	1992	1995	1997
		%						
Unemployment								
<i>Engineers</i>								
Men		8.5	2.7	8.1	5.0	10.1	3.5	4.6
Women		5.1	8.1	5.9	10.5	10.3	3.9	7.1
<i>Non-engineers</i>								
Men		9.2	4.0	9.5	7.5	9.9	5.2	9.4
Women		9.3	4.0	8.4	6.6	9.8	4.6	8.9
Part-time work								
<i>Engineers</i>								
Men		1.4	1.5	1.0	0.6	1.0	1.0	2.0
Women		3.1	1.0	1.0	5.3	1.0	3.4	1.8
<i>Non-engineers</i>								
Men		6.1	3.9	3.8	2.7	6.7	3.9	9.8
Women		12.9	11.3	10.0	10.9	12.0	12.4	17.3
Temporary work								
<i>Engineers</i>								
Men		12.6	3.9	9.7	4.8	11.4	4.8	9.8
Women		27.3	17.5	17.1	9.7	13.7	11.6	21.1
<i>Non-engineers</i>								
Men		23.7	7.6	18.0	10.1	22.5	13.1	24.9
Women		26.3	9.5	20.0	12.8	23.7	16.9	28.3
		average scores ¹						
Earnings satisfaction								
<i>Engineers</i>								
Men		67	67	66	66	68	66	70
Women		67	69	64	69	69	65	71
<i>Non-engineers</i>								
Men		66	67	64	66	67	65	65
Women		66	65	61	66	67	66	64
Overall job satisfaction								
<i>Engineers</i>								
Men		79	78	80	80	80	81	80
Women		79	81	77	81	77	79	79
<i>Non-engineers</i>								
Men		78	82	78	80	80	80	78
Women		77	79	77	80	79	80	76
Education satisfaction								
<i>Engineers</i>								
Men		78	74	84	82	83	83	78
Women		75	75	77	80	80	81	77
<i>Non-engineers</i>								
Men		71	74	79	79	74	74	73
Women		68	72	80	77	73	74	70
Job skills-education match								
<i>Engineers</i>								
Men		90	92	93	94	72	72	75
Women		89	94	90	94	67	71	76
<i>Non-engineers</i>								
Men		80	86	81	84	68	69	62
Women		82	86	84	85	71	71	63

Notes:

In this table, the samples exclude graduates who had completed another degree and those who were working part time because of school.
 1. Scores are calculated on a scale of 0 to 100, with higher scores indicating greater satisfaction and a closer match of job skills and education.

Source: National Graduates Surveys.

Women in general tend to work part time more than men do. This difference between the sexes is much less noticeable among engineering graduates, however, reflecting the considerably lower percentage of female engineering graduates working part time relative to graduates in other fields. In this respect, female engineers seem less likely than other women—and less likely than men with non-engineering diplomas—to exhibit a more marginal attachment to the labour force. This could be due to several factors, including female engineers' preference for working full time (i.e., supply side factors), or the lack of part-time jobs for those who want them (the demand side).¹⁰

Substantially more female than male engineering graduates are employed on a temporary basis. Between 9.8% and 12.6% of male engineers held temporary jobs at the first interview, compared with between 21.1% and 27.3% of female engineers. At the second interview, the proportions ranged from 3.9% to 4.8% for men, and from 11.6% to 17.5% for women. This said, except for the 1982 cohort, female engineers were less likely than non-engineers to work on a temporary basis.

Satisfaction measures

Table 3 also presents average scores for various job and education satisfaction measures. Very little variation seems evident in terms of earnings satisfaction through time and by sex in these broadly defined fields of study. This variation marginally favours engineers (male and female) over non-engineers, especially among the last cohort. The scores for overall job satisfaction are also quite uniform across periods and across various groups of workers.

Differences begin to arise, however, when one considers the job skills–education match index. This measure evaluates the extent to which the skill sets obtained by graduates in their education programs are utilized in their current jobs. Unfortunately, the precise construction of this measure has changed over time (conforming to the information available in the NGS databases). One should, therefore, not read into the declining job skills–education match levels across cohorts that university programs became less geared to the needs of the labour market, or that graduates became less successful in finding jobs in their particular fields. The declines might only reflect changes in the measure.

Regardless, consistent differences are observed across fields of study. In most cases, the job skills–education match levels were much higher (from 3 to 14 percentage points) for engineers of both sexes than for non-engineers. Match levels also increased the most between the first and second interviews for female engineers. A tighter match is not necessarily better than a

looser one: some education programs might provide a set of relatively generic skills with broader applicability (i.e., portable to a wider range of jobs). However, since graduates derive some gratification from utilizing skills they developed in school, and since closer matches between job and education represent more promising career profiles, higher values on the job skills–education match index should be seen as a more positive outcome. Thus this measure indicates an advantage of engineering over other fields of study for both women and men.

There also appears to be a good deal of variation in terms of the graduates' satisfaction with their education programs. Perhaps of greater importance, at all times except 1988, women with engineering degrees reported greater satisfaction with their program of study than did women in other fields: their scores exceeded those of female non-engineers by three to seven points. Nonetheless, female engineers generally declared lower levels of education satisfaction than their male colleagues. Satisfaction levels across fields of study remained relatively static from the first to the second interview, but women typically closed the gap from two to five years after graduation.

Outcomes at the graduate level

Earlier in this report, we established that the share of all bachelor's diplomas awarded to women increased steadily since the first cohort of students graduated in 1982. Is there a similarly increasing trend at the graduate level? What happens to the earnings gaps for sex and field of study at the master's and PhD levels? Answers to these questions can be found in Table 4.

Since 1982, women's representation in graduate programs has grown across all fields of study. Nevertheless, women still account for a smaller percentage of master's and PhD degrees than of bachelor's diplomas. Engineering programs, in particular, consistently graduate the lowest share of women at the master's and PhD levels. In 1982 and 1995, 9% and 20%, respectively, of master's degrees in engineering were awarded to women. In contrast, 56% and 68% of women in applied science, where the female representation was the greatest, received master's degrees in 1982 and 1995, respectively.

The share of engineering doctorates awarded to women (Table 4) was lower still, reaching a plateau of 10% in 1992. This represents such a small number of degrees in engineering that earnings figures cannot be reported for women in this category with any statistical significance. We can, however, discuss earnings for master's graduates.

Not surprisingly, in all fields of study, average earnings are higher for graduates with a master's degree than for those with a bachelor's degree. But female

Table 4
Average earnings¹ of master's and PhD graduates, by sex and field of study

	1982 Cohort		1986 Cohort		1990 Cohort		1995 Cohort
	1984	1987	1988	1991	1992	1995	1997
	\$						
Master's							
<i>Social sciences and humanities</i>							
Men's earnings	53,100	58,700	53,100	58,800	54,500	59,900	47,700
Women's earnings	45,500	49,300	47,100	50,500	48,200	52,200	41,300
Share of women ² (%)		41.0		46.0		51.0	54.0
<i>Pure sciences</i>							
Men's earnings	48,300	53,900	46,700	48,000	42,300	52,100	41,000
Women's earnings	42,400	45,400	42,400	43,900	40,500	46,000	34,400
Share of women (%)		20.0		23.0		20.0	30.0
<i>Applied sciences</i>							
Men's earnings	57,300	69,400	62,500	64,400	44,300	52,200	53,400
Women's earnings	49,000	52,100	45,700	50,200	45,000	51,000	47,800
Share of women (%)		56.0		61.0		61.0	68.0
<i>Engineering</i>							
Men's earnings	51,600	57,900	44,500	54,600	48,500	54,900	44,800
Women's earnings	44,600	55,500	43,600	48,200	42,600	51,800	39,700
Share of women (%)		9.0		10.0		15.0	20.0
PhD							
<i>Social sciences and humanities</i>							
Men's earnings	52,100	58,200	52,200	55,600	53,700	59,400	47,400
Women's earnings	51,400	53,800	50,100	53,900	53,000	56,400	47,500
Share of women (%)		34.0		46.0		44.0	42.0
<i>Pure sciences</i>							
Men's earnings	50,200	56,500	46,400	54,500	44,500	54,000	39,100
Women's earnings	-	-	-	-	43,200	53,400	40,100
Share of women (%)		11.0		18.0		22.0	16.0
<i>Applied sciences</i>							
Men's earnings	44,100	53,600	47,800	55,100	49,300	57,900	37,200
Women's earnings	38,500	46,100	46,400	57,100	50,000	54,500	41,700
Share of women (%)		31.0		54.0		37.0	41.0
<i>Engineering</i>							
Men's earnings	60,000	66,700	54,400	61,100	53,800	59,500	47,900
Women's earnings	-	-	-	-	50,200	-	-
Share of women (%)		3.0		9.0		10.0	9.0

Notes:

In this table, the samples exclude graduates who had completed another degree and those who were working part time because of school.

Samples are restricted to those working full time for earnings greater than \$5,000.

Dashes indicate too few observations to report.

1. Constant 1997 dollars.

2. 'Share of women' refers to the percentage of women in each cohort.

Source: National Graduates Surveys.

engineers usually had the highest earnings of all women with bachelor's degrees two years after graduation, whereas at the master's level they ranked second to last, behind applied social science and humanities graduates. However, by the second interview, female engineers of the first and third cohorts had gained ground on other women, placing first and second, respectively, in terms of earnings. That indicates favourable earnings growth in the longer run.

Still, the figures presented in Table 4 do not seem to indicate that the earnings gap between the sexes was generally narrower at this higher level of schooling. What seems to be the case, though, is that at the master's level women's earnings dropped less dramatically relative to those of men five years after graduation than was the case at the bachelor's level. The earnings gap was narrower in engineering in only two periods: 1987 and 1988.

Thus the growing percentage of women awarded bachelor's degrees was indeed accompanied by a general rise in women's representation in advanced degree programs. And, as at the bachelor's level, the most important relative increase occurred in engineering, where the percentage of female master's and PhD graduates more than doubled from 1982 to 1995. Nevertheless, women remained substantially underrepresented in engineering, especially at the graduate level.

Furthermore, contrary to what occurred at the undergraduate level, female engineers with graduate degrees did not enjoy a general earnings advantage relative to other women. This might partly explain why women remain reluctant to pursue advanced degrees in engineering, especially if there are other less positive outcomes

associated with this field of study. Moreover, this poor record at the graduate level could have an influence on enrolment rates at the undergraduate level.

However, the relatively small number of individuals who pursue higher degrees—especially in the case of women in engineering—might differ sufficiently from the majority who stop after obtaining a bachelor's degree to affect the interpretation of our findings. This is another form of the selection problem related to choice of field of study. Again, its resolution lies beyond the scope of this report.¹¹

Conclusion

It has become trite to mention the fundamental role the creative power of human beings—'human capital'—plays in economic growth. Scientists and engineers are key players in this dynamic, so it is not surprising that industrialized countries compete to develop, attract and retain these specialists, thus hoping to generate a competitive advantage over other countries.

Attracting women to these fields could become an important means of increasing the number of engineers. However, women are still the missing link in the engineering profession, even as those who enter it have generally been doing quite well in the labour market and are happy with their career choice. Hence, these findings suggest that the low female representation in engineering stems from conditions unrelated to the labour market. Since the engineering profession, like any other, is socially shaped, turning to social conditions might be the key to finding solutions to this problem.

The Organisation for Economic Co-operation and Development and the Canadian government have both made important attempts to better understand the role of human and social capital in economic growth.¹² Their research is aimed at better understanding, among other issues, the education and career choices faced by women, especially in science and engineering. The empirical evidence in this report suggests that social conditions probably play a central role in these issues, at least in the Canadian context.

Notes

1. See Vincenti (1990), Lavoie and Finnie (1996) and Scherer (1999) for an in-depth analysis of the role of engineers in economic growth.
2. The School Leavers Survey, conducted by Statistics Canada on behalf of Human Resources Development Canada, reports that "among women aged 22 to 24, 89% had completed their high school diploma by 1995, while 10% were still classified as high school leavers. In comparison, 81% of young men had graduated from high school by 1995 and 18% were high school leavers...This gender pattern—where smaller proportions of men than of women were graduated from high school—was evident in every province." (HRDC and Statistics Canada 1996, p. 3.)
3. The 2000 data were unavailable when this research was undertaken.
4. Findings at the graduate level must be accompanied by an understanding that the relatively small numbers of individuals who pursue higher degrees, especially in the case of women, might differ from the majority, who stop after obtaining a bachelor's diploma, sufficiently to affect the interpretation of those findings. This is the well-known 'selection problem,' which has a number of possible solutions. But addressing that problem is beyond the scope of this report, whose goal is to provide a more descriptive view of the early career outcomes of recent graduates.
5. In the United States, the National Science Foundation reports that, while women constituted 56% of undergraduate enrolment in 1996, female students represented only 19% of total undergraduate engineering enrolment (NSF 1998, pp. 2-16 and 2-20). Thus the American and Canadian situations are very similar.
6. See Lavoie and Finnie (1996) and Florman (1987) for some tentative hypotheses related to the under-representation of women entering engineering.
7. Average earnings are presented for all graduates and for applied science graduates, excluding physicians. Although physicians account for quite a small share of both categories, they have substantially higher earnings than most other workers. Failure to exclude these professionals from average earnings computations would introduce a strong upward bias in the estimates.

8. The earnings measure available in the first six NGS databases (1984 through 1995) represents what the individual reported he or she would earn on an annual basis if the current job were to last the whole year. It thus represents an annual rate of pay. In the last interview (1997), however, individuals were asked to report their rate of pay in the manner they preferred (hourly, daily, weekly, etc.), along with the usual hours of work, from which an annual measure was constructed (see also the Appendix). The two measures are conceptually similar and might be expected to give comparable amounts. In practice, however, the resulting distributions of earnings vary, suggesting that direct comparisons of the earlier periods with the most recent one should be made with a good deal of caution.
9. A proper investigation of these issues might include a structurally derived choice-theoretic model that includes equations representing individuals' choices of field of study. Such an investigation might then look at earnings patterns while taking these processes of choosing into account. It would, however, be difficult to specify and estimate such a model in the present case because of the lack of suitable identifying variables available in the NGS data (i.e., variables that affect the choice of discipline but not the earnings levels), and because identifying such models using functional form alone is never the preferred method.
10. See Lavoie and Finnie (1999) for more on this issue.
11. One route would be to model the individual's choice of going on to graduate studies in an econometric framework. In this case, the principal benefits would be the enhanced career opportunities (indicated by employment rates and earnings levels) at the higher degree levels; the costs would be defined in terms of foregone earnings over the additional years spent in school and of the relevant direct costs (tuition, books and equipment, etc.). However, identifying such a system of equations in the statistical sense would again present significant challenges in the context of the NGS data used here.
12. For example, the OECD in collaboration with HRDC held an international symposium, *The Contribution of Human and Social Capital to Sustained Economic Growth and Well-Being*, in Québec in March 2000.

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Appendix

Description of the variables used in the analysis

Earnings: For the first three cohorts, this variable was based on the question "Working your usual number of hours, approximately what would be your annual earnings before taxes and deductions at that job?" Values were converted into 1997 constant dollars and capped at \$147, which represents the lowest cap employed across the various interviews. For 1997, the measure was based on three questions that asked the individual to do the following: i) identify the easiest way to report his or her earnings (yearly, monthly, weekly, hourly, or some other basis); ii) give the actual before-tax earnings on the indicated basis; and iii) report the usual hours of work at the job (the average

of the last four weeks if it varies). These results were then used to construct annual totals (capped at \$1,997). In this way, the measure is consistent across the first six periods but is not directly comparable between these and the last period because of the changed construction of the variable in that year.

Unemployment: The definition used here considers full-time students to be unemployed. This departs slightly from Statistics Canada's conventional definition. Usually only part-time students are deemed 'ready to work' and can be counted as unemployed. This difference arises from the missing information pertaining to enrolment status as of the interview date in most years of the NGS data (i.e., full-time students cannot be distinguished from part-time students). The resulting unemployment rates are, therefore, slightly biased upward from the rates that would be obtained with the conventional definition.

Part-time employment: Part-time jobs are defined as those at which the individual worked fewer than 30 hours per week. This is a standard definition.

Temporary job: This variable was based on specific questions that were almost perfectly consistent across surveys. The exception is the 1987 data, which understate the number of temporary workers to a small degree, since individuals who had worked continually with the same employer since the first interview (1984) were simply imputed to have been in a permanent job.

Earnings satisfaction: This variable was based on the question "Considering the duties and responsibilities of your job, how satisfied are you with the money you make?" To reduce the associated categorical responses to simple scalar indices, the four possible responses were ordered on a scale of 0 to 100 and assigned the following values: 'not at all satisfied' = 0; 'not very satisfied' = 33.3; 'quite satisfied' = 66.7; and 'very satisfied' = 100. The table reports the average values of these scores.

The job skills–education match: For the first three cohorts (1982, 1986 and 1990 graduates), the match was based on

the question "Do you use any of the skills acquired through the education program in your job?" For the 1982 and 1986 cohorts, the available responses of 'no' and 'yes' were assigned values of 0 and 100, respectively. For the 1990 cohort, the four possible responses were assigned the following values: 'not at all' = 0; 'very little' = 33.3; 'to some extent' = 66.7; and 'to a great extent' = 100. For the last cohort (1995 graduates), the three possible responses to the question "How closely is your current (main) job related to your degree, certificate, diploma?" were assigned the following values: 'not related at all' = 0; 'somewhat related' = 50; and 'closely related' = 100. The table reports the average values of these scores, with higher values indicating a closer job skills–education match. Given these constructions, the measure should be consistent across the first four periods (i.e., the two interviews for each of the first two cohorts), and for the next two periods (the third cohort), but not between these two different sets or between either of these and the final data point (1997).

Overall job satisfaction: Response options to the question "Considering all aspects of your job, how satisfied are you with it?" were similar in all years: 'very satisfied,' 'satisfied,' 'dissatisfied' and 'very dissatisfied' for the 1986 and 1990 cohorts (interviewed in 1988 and 1991, and in 1992 and 1995, respectively). The last two response options differed very slightly for the 1982 cohort: 'not satisfied' and 'not at all satisfied.' The responses were assigned values from 0 to 100 in the same manner as the job skills–education match variable described above. The tables report the average values of these scores, with higher values indicating greater job satisfaction. The job satisfaction question was not asked of the self-employed in 1984 or 1997.

Education satisfaction: An index was constructed from the responses to the question "Given your experience, would you have taken the same field of study or specialization?" The tables report the average index scores. Higher values indicate greater satisfaction with the choice, which essentially represents the percentage of graduates who said they would have chosen the same program again.

FOR



100 years of education

The 20th century has seen dramatic changes to the educational system in Canada. At the beginning of the century, Canada was still a largely agricultural nation that did not put much of a premium on education. Only slightly more than half of school-aged youngsters attended school on a daily basis and more than 1 in 10 people could not read or write at all. In the intervening years, government support of education has made elementary and secondary education universally accessible across Canada, and helped to develop a sophisticated network of universities and colleges. In addition, a wide array of private sector business and trade schools has grown up alongside these public sector institutions. By the end of the century, people with university degrees outnumbered those with less than a grade 9 education.

The benefits of education

Over the course of the last 100 years, the overall educational attainment of Canada's population has increased and the benefits of education to individuals and to society have become clear. An educated workforce, capable of using knowledge to generate innovation and wealth, is vital to a strong and prosperous economy. Education greatly influences the types of jobs Canadians obtain, and increases their likelihood of being employed and their standard of living. For example, the 1996 Census shows that graduates with a bachelor's degree were more likely to have been employed full time full year in 1995 (51%) than high school graduates (35%), and that they earned more (a median income of \$43,600 versus \$29,700).

In the same way that income increases with educational attainment, so too does the extent to which people contribute to their communities. People with higher education are more likely to volunteer, have greater involvement in their children's education, be involved in sports, and donate to charities. Furthermore, the educational achievement of parents, and all that it entails, is generally passed on to their children.

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Public education in Canada

The foundations of the public education system in Canada were laid at Confederation when it was agreed that education would be a provincial responsibility. As such, educational organization and practices have varied (and continue to vary) from province to province or territory. Shortly after Confederation, compulsory school attendance laws obliged parents to send their children to school. At the same time, public tax-supported schools were built, and the principle of free schooling for all children during their formative years was established.

Despite the availability of free education, though, many children frequently did not go to school, particularly boys. Long absences were common due to the demands of planting or harvest time, the need to help support the family, illness, or bad weather. In 1901, for example, about 1.1 million children were enrolled in elementary or secondary schools, but an average of only about 6 out of 10 students attended on a daily basis.

In response to these kinds of attendance problems, further efforts were made to lengthen the period of compulsory schooling and to enforce laws requiring attendance. By 1921, all provinces except Quebec had laws setting out the minimum amount of time that children must attend school full time. For example, in British Columbia all children between 7 and 14 years old were obliged to attend school full time during the school year.

Although education was free for young children and educators recognized that children benefited most from attending school at an early age, many children did not start school until age 7 or 8. In 1921, only 52% of 6-year-olds and 83% of 7-year-olds attended school. In 1930, one

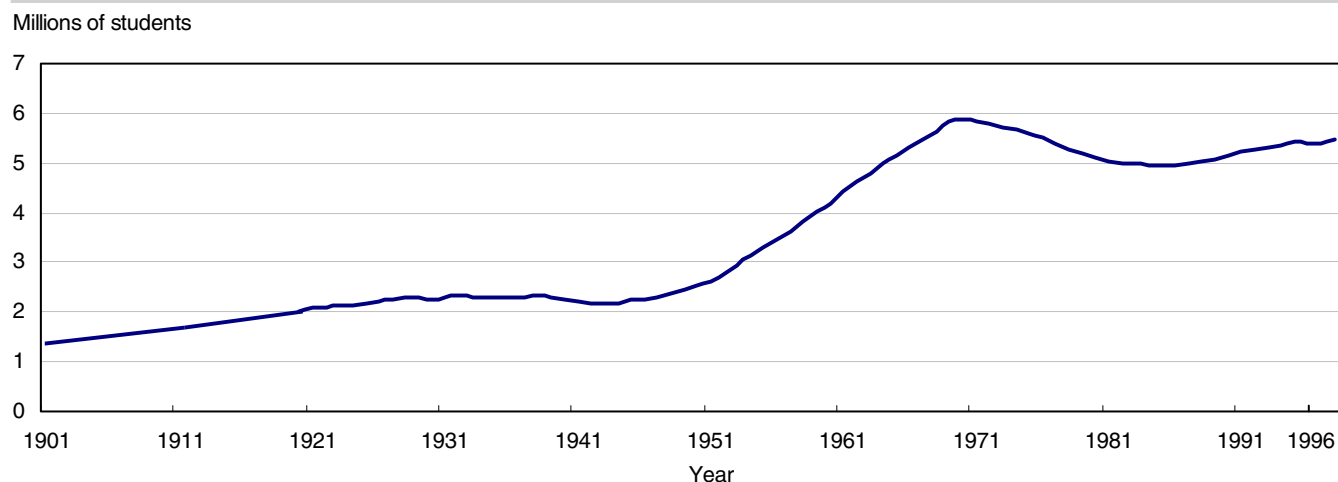
in three grade 1 students were aged 8 or older; however, regular daily attendance had risen to 86% of enrolment. More regular attendance patterns, combined with the raising of the age of mandatory attendance, extended the time children spent in the classroom by two years compared with 1919.

The Great Depression of the early 1930s greatly affected families and schools. Rural Canada, particularly the Prairies, was especially hard hit. Provincial grants and local property assessments in support of publicly-funded schools dropped by 15% between 1930 and 1935.¹ Rural schools were often supported by only a few dozen families. Also, because rural families generally had lower incomes and more children than urban families, rural families found it more difficult to keep their children in school and support the operation of schools. Both before and after the Depression, rural children were less likely than urban children to stay in school beyond the compulsory age of attendance.

Enrolment explodes with the baby boom

Beginning in the late 1940s, the postwar baby boom produced an explosion in elementary/secondary enrolment. It peaked at 5.9 million in 1970. This dramatic growth brought with it large class sizes, shortages of classroom space and a scarcity of teachers. School board officials, who had grown accustomed to only small changes in enrolment during the 1930s and 1940s, could not build schools fast enough during the 1950s and 1960s. Between 1950 and 1970, enrolment increased by 134% while expenditures on elementary/secondary education increased by over 700% after accounting for inflation.

Graph 1
Elementary/secondary enrolment rocketed upwards as baby boomers entered the classroom



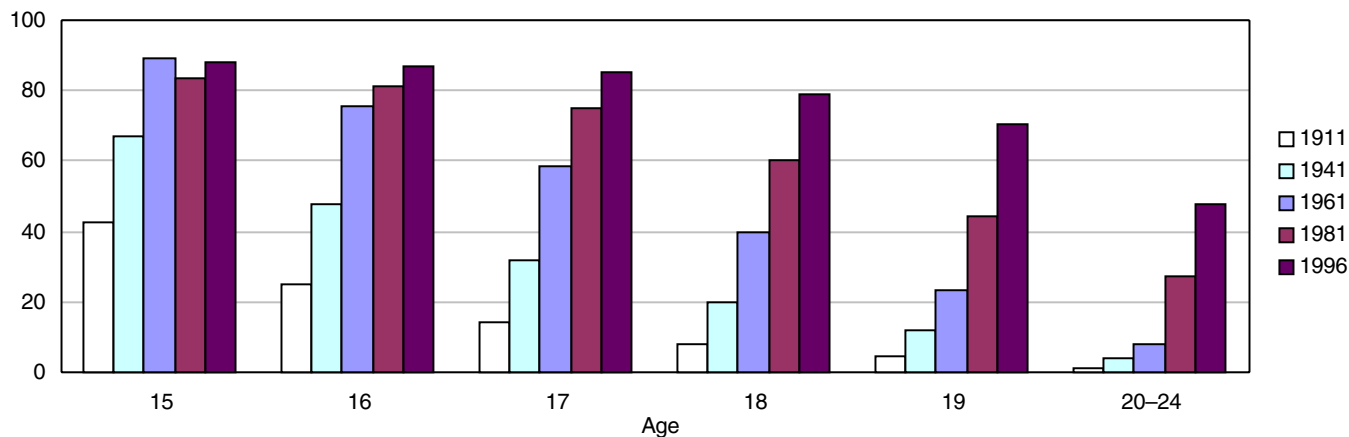
Sources: Statistics Canada, Catalogue nos. 81-568, 81-229 and 81-003 and special tabulations.



Graph 2

Canadians now leave school at older ages because they are staying in school longer

% of population attending school



Sources: Statistics Canada, Catalogue nos. 98-1931, vol.1 and 98-1941, vol.1 and special tabulations.

After the 1970 peak, enrolment dropped, reaching 4.9 million in 1985 as baby boomers moved on to colleges and universities and the much smaller baby bust cohort (born between 1967 and 1979) moved into elementary and secondary schools. Although there were fewer students, teenagers stayed in school longer—high school graduation rates that were 53% in 1971 rose to 70% in 1986 and then to 75% in the mid-1990s.² By 1995, enrolment had rebounded to 5.4 million.

Although Canada's 1998 secondary graduation rate (72%) was comparable to that of the United States (74%), it was still well below those of other industrialized countries such as France (87%) and Japan (96%).³ In the late 1980s and early 1990s, attention was focused on the number of early school leavers. Almost one in five (18%) 20-year-olds in 1991 had left school before graduation; by 1995, there were still 15% who had not completed high school. According to the 1996 Census, about 290,000 young adults aged 20 to 24 (15%) were not attending school and had not graduated from high school.

In the early 1950s, more than half of the population 15 years of age and older had less than a grade 9 education. Leaving school early did little harm since primary-sector and blue-collar manufacturing jobs were easy to find. Today, such jobs are much less common and, increasingly, high school (and often postsecondary) graduation may be a minimum requirement for employment. Therefore, young people who drop out in the 1990s may lack many skills needed to enter the labour market of the 21st century.

Postsecondary education

Some of the greatest advances in education in Canada in the 20th century have come in the area of postsecondary education. In 1901 there were only about 6,800 students in attendance full time at 18 degree-granting institutions in Canada. The first women enrolled at Canadian universities in the 1880s, and by the turn of the century about 12% of university students were women, most of whom were enrolled in arts and science programs. By 1920, full-time enrolment had nearly quadrupled to 23,200 and 17% were women. At this time, Canadian universities were mainly funded by fees and gifts from private citizens.⁴

Government grants to universities declined during the Depression, and staff salaries were cut. With no jobs available to tempt young people to look for jobs, those able to afford a university education took advantage of the situation. Enrolment rose slowly but steadily. Between 1920 and 1940, enrolment increased by 57% and by 1940, 23% of university students were women. While the student population in arts and science nearly doubled, the professional fields increased only modestly. The largest enrolment increases occurred in female-dominated fields such as education, household science, nursing, social work, library science and physical and occupational therapy.⁵

During the Second World War, there was a great deal of postsecondary educational activity, including technical training of more than 700,000 military personnel. In August 1942, Parliament passed the *Vocational Training Co-ordination Act*, which authorized training related to the

The changing nature of literacy — grade 9 is no longer enough

In the early 20th century, illiteracy was fairly widespread. In 1901, 14% of the population 5 years of age and older could not read or write at all; in 1921, it was 9% (or 5% of the population 10 years of age and older). This was partly due to Canada's immigration policy of the late 19th and early 20th centuries, which saw many immigrants arrive who spoke neither French nor English. As a result, whereas only 4% of the Canadian- or British-born population 10 years of age and older were illiterate, the rate for the foreign-born was 12%.

As the educational system expanded in the post-World War II era to handle the baby boom, experts became increasingly concerned that many Canadians were inadequately educated to cope with the complex nature of industrial society. Educational attainment of less than grade 5 was considered a cut-off for basic adult literacy, and less than grade 9 for functional illiteracy in industrialized economies such as Canada's.¹ In 1971, 6% of the adult population not attending school full time had education of less than grade 5 and another 24% had a grade 5 to grade 8 education.

In 1994, the first International Adult Literacy Survey (IALS) measured literacy levels of the Canadian adult population aged 16 to 65. The survey used detailed exercises to test skills at understanding and using printed information in daily activities at home, at work and in the community. The survey categorized literacy into five broad levels, with Level 1 being the lowest and Level 5 being the highest. Almost three out of five Canadians (over 10.5 million) had sufficient prose, document and numeric literacy skills to meet

most everyday requirements in dealing with printed documents (Level 3 or higher). One in four Canadians had Level 2 skills (over 4.6 million); although these people generally believed they had good or excellent skills, their test scores were weak. For about one in six Canadians (over 3.1 million), dealing with printed materials presented a severe difficulty (Level 1).

Inadequate literacy is a serious personal and social problem. Literacy skills are crucial to the well-being of individuals and are linked to economic security. In 1994, working-age adults with weak Level 1 skills were less likely (59%) to have been employed during the year than those who had strong Level 4/5 skills (89%);² those who were employed worked fewer weeks per year than working adults with Level 4/5 skills. Adults with Level 1 literacy were also more likely to live in low-income households and had average personal income about two-thirds that of the average of adults with Level 4/5 skills.

- For more information, see Shalla, V. and G. Schellenberg. 1998. *The Value of Words: Literacy and Economic Security in Canada*. Statistics Canada Catalogue no. 89F0100XIE; Organisation for Economic Co-operation and Development. 1995. *Literacy, economy and society: Results of the first International Adult Literacy Survey*. Statistics Canada Catalogue no. 89-545-XPE.

1. Council of Ministers of Education, Canada. 1988. *Adult illiteracy in Canada: Identifying and addressing the problem 5*.

2. *Levels 4 and 5 are combined to ensure data reliability*.

Canadian war effort, including tradespersons in the armed forces and workers in industry. The *Act* also provided for training of personnel discharged from the armed forces, and for training that might be desirable in the postwar period. After the war, the *Veterans Rehabilitation Act* offered payment of tuition and other fees for each veteran starting a university or university preparation course within 15 months of leaving the military. In 1947-1948, over 32,000 ex-service personnel received government assistance for university training.

This era also marked a new approach to government recognition of the social and economic importance of postsecondary education. In 1951, the Massey Royal Commission called for a significant expansion of public responsibility for postsecondary education. The Commission recommended that the federal government make direct and unrestricted grants to universities.

Parliament approved the recommendation for grants for the 1951-1952 academic year.⁶

With these new financial underpinnings, and with growing grants from provincial governments, universities and colleges were able to accept growing enrolment throughout the 1950s, 1960s and 1970s. Demand for postsecondary education was high as the demand for skilled labour increased and as the baby boom children reached late adolescence. In the mid-1970s, strong enrolment growth was interrupted at universities, but it began to grow again at the end of the decade. In the 1980s, full-time university enrolment grew by 35%, peaking in 1994, and then levelling off. This flattening can be traced to several factors: the stabilization of the size of the young adult population; the weak economic recovery; mixed messages from the labour market—most new jobs required postsecondary education but the recession of the early

Student assistance

Responding to concerns about the accessibility of post-secondary education, in 1964 the federal government introduced the Canada Student Loan Program to provide financial assistance to postsecondary students who qualified for assistance according to assessed need. The program guaranteed loans made to qualified students and paid the interest on the loans while the student attended school and for six months following graduation. Provincial governments also instituted their own financial assistance programs.

In the 1990s, there was a major shift away from grant support of postsecondary students. This move, combined with increased loan limits, meant that students received larger loans and less grant assistance. At the same time, personal savings rates had dropped and government transfers to universities during the mid-90s declined. Family income, in real terms, remained about the same while tuition fees more than doubled. In 1999-2000, tuition fees in an average undergraduate arts program stood at \$3,379 compared with \$1,595 in 1988-1989 (1999 dollars). As a result of these

developments, the 1990s saw a dramatic increase in the average debt loads of students who borrowed.

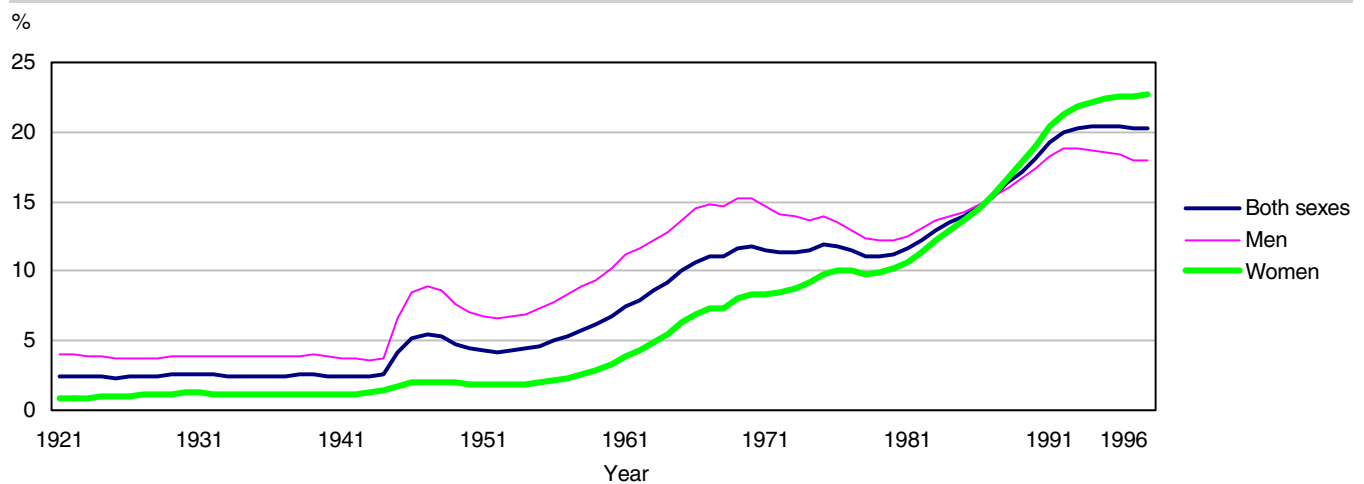
In February 1998, the Government of Canada announced a number of measures to address concerns about mounting student debt, including income tax credits for interest paid on student loans, grants for students with dependents, extension of education tax credits to part-time students, lengthening the interest relief period to up to 30 months following graduation, and the possibility of reducing the debt for student borrowers in the greatest financial hardship. However, legislation was also introduced to prevent borrowers from avoiding repayment of student loans through bankruptcy for a period of 10 years after the end of their studies.

- For more information, see Clark, W. 1998. "Paying Off Student Loans," *Canadian Social Trends*, 51; Human Resources Development Canada (HRDC). 1998. *Canada Student Loans Program, 1999-2000: Full-time and Part-time Students Information Guide*. Ottawa: HRDC.



Graph 3

Full-time university enrolment rates¹ have risen dramatically since World War II



Note:

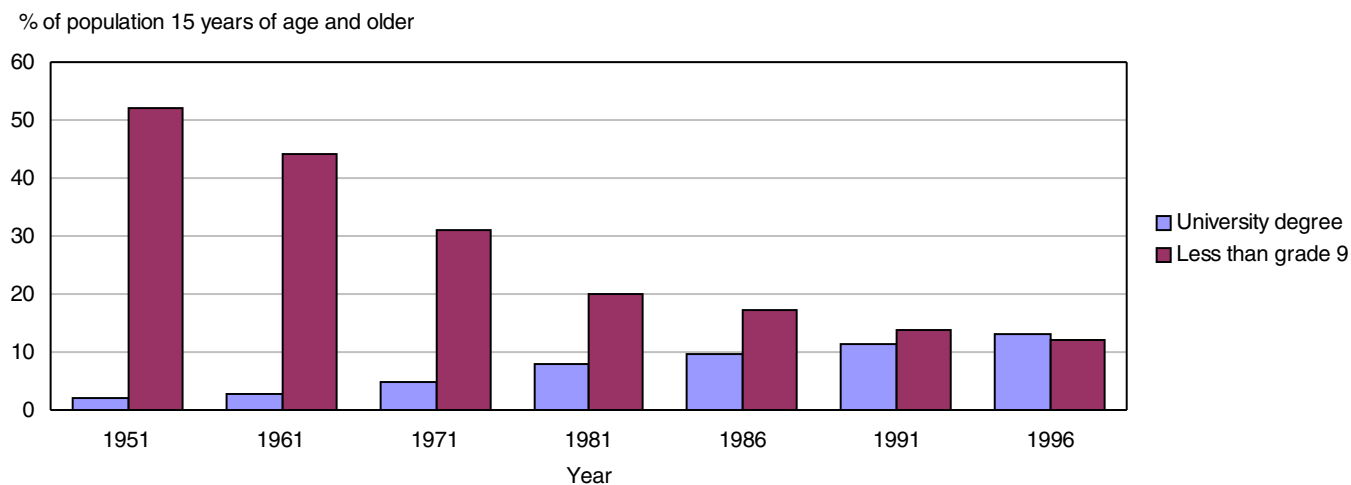
1. Total full-time university enrolment related to 18–24 population age group.

Sources: Statistics Canada, Catalogue nos. 81-568 and 81-229 and author's calculations.



Graph 4

The level of schooling in Canada has risen steadily and rapidly over the last 50 years



Sources: Statistics Canada, *Census of Canada, Catalogue no. 93-328 and special tabulations.*

1990s had demonstrated that graduates were not immune from unemployment; stability of family size and incomes; and a drop in personal savings rates.⁷

Women outnumber men at universities by the 1990s

In 1960, about one quarter of students enrolled at university were women, not much different from the early 1930s. But this began to change in the early 1960s, when female-dominated teacher training programs were transferred from non-degree granting teachers colleges to universities. Also, beginning in the 1970s, women enrolled increasingly in male-dominated fields of study such as law, engineering and medicine. In the 1980s and 1990s, the training of registered nurses was also transferred to universities.

By 1989, there were more women enrolled full time at Canadian universities than men, and the percentage of women had continued to grow into the late 1990s. Women are still underrepresented in engineering, mathematics and sciences; for example, in 1997 20% of bachelor's degrees in engineering were granted to women, up from less than 1% in 1950. But women have made major gains in law and medicine, where they now represent about half of the first professional degrees granted; in 1950, only 4% of law and 5% of medical degrees were granted to women.

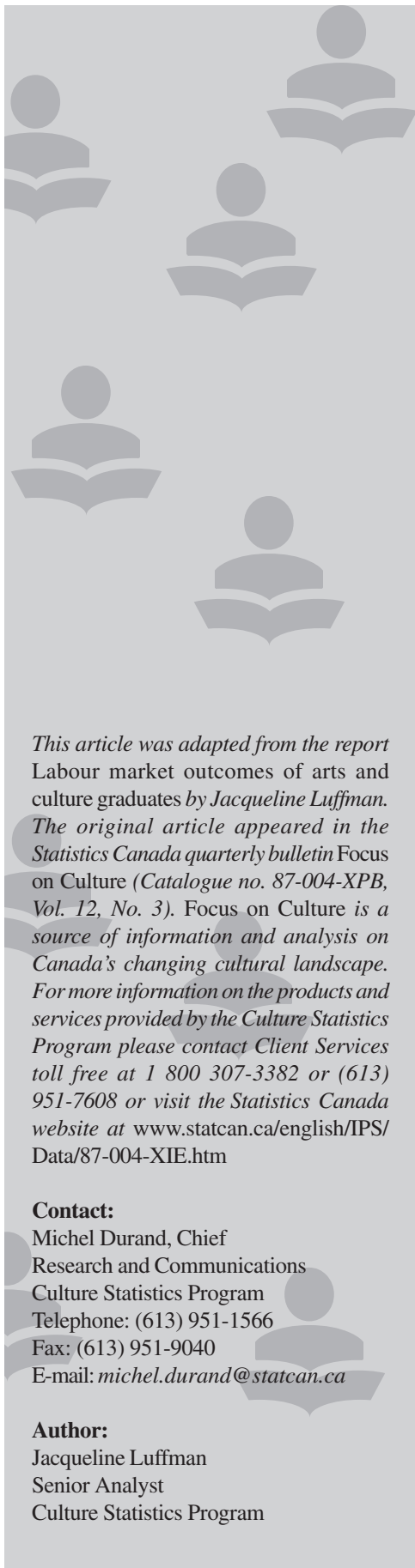
Summary

In the postwar period, elementary-school enrolment increased faster in Canada than in any other industrialized country. Rising expectations, the widespread belief in education as a means of upward mobility, and rising affluence encouraged students to stay in school longer.

Governments increased expenditures on education to 8% of GDP at its peak in 1992. In 1997, Canada ranked among the world's educational leaders, with spending on education as a proportion of GDP second only to the United States among G7 countries.⁸

Notes

1. Urquhart, M.C. and K.A.H. Buckley. 1965. *Historical Statistics of Canada*. 599.
2. High school graduates as a percentage of the 18-year-old population outside Quebec and 17-year-old population in Quebec.
3. Organisation for Economic Co-operation and Development. 2000. *Education at a Glance: OECD Indicators 2000 Edition*. 147.
4. Harris, R.S. 1976. *A History of Higher Education in Canada 1663-1960*. 210.
5. *Ibid.*, 351.
6. Sheffield, Edward, Duncan D. Campbell, Jeffrey Homes, B.B. Kymlicka, James H. Whitelaw. 1978. *Systems of higher education: Canada*. 8-9.
7. Association of Universities and Colleges of Canada. 1999. *Trends: The Canadian University in Profile*. 51.
8. Organisation for Economic Co-operation and Development. 2000. *op. cit.* 57.



School-to-work transition: A focus on arts and culture¹ graduates

Over the last few years, we have learned a great deal about the culture labour force.² We know that culture workers have, on average, higher levels of education, higher rates of self-employment, lower rates of unemployment, lower wages, a greater likelihood of working part time, and a tendency to be concentrated in certain regions of the country. Culture organizations are increasingly concerned about their capacity to sustain the growth and vitality of their labour force. The 1990s witnessed reductions in government support programs, increases in the cost of producing cultural goods and services and a continued slackness of consumer confidence. Many medium and small cultural businesses have disappeared under the pressure of import competition and difficult economic times. These factors have an impact on the employment of creative and performing artists, on jobs and institutions in the culture sector and on access to Canadian cultural goods.

We know from the Labour Force Survey (LFS) that 578,000 individuals were working in culture industries in 1999. Of these, about 278,000 were in culture occupations.³ The culture labour force consists of workers who are quite knowledgeable, creative, entrepreneurial, skillful and highly motivated. These are all skills that are in great demand in today's economy. The Cultural Labour Force Survey (1993) concluded that training and technological change are important issues for those who work in the sector and that the needs of their professional development are not always met⁴. It is critical, therefore, to monitor what happens to individuals who chose to study arts and culture and determine whether they end up finding work in their chosen fields.

There are limited sources of labour market information for recent arts and culture graduates. Human Resources Development Canada (HRDC) publishes one of the few, a job futures publication that predicts the labour market outlook for recent graduates on a three-point scale (poor, fair or good). The latest *Job Futures* publication (2000) reveals that culture graduates generally have a job outlook of "fair" into 2004. For example, there will be fewer job openings for music graduates than job seekers and only limited work available in the radio and television industry. Most would agree that many artistic and cultural occupations are highly attractive as fields of employment but their

This article was adapted from the report Labour market outcomes of arts and culture graduates by Jacqueline Luffman. The original article appeared in the Statistics Canada quarterly bulletin Focus on Culture (Catalogue no. 87-004-XPB, Vol. 12, No. 3). Focus on Culture is a source of information and analysis on Canada's changing cultural landscape. For more information on the products and services provided by the Culture Statistics Program please contact Client Services toll free at 1 800 307-3382 or (613) 951-7608 or visit the Statistics Canada website at www.statcan.ca/english/IPS/Data/87-004-XIE.htm

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allure must be balanced against the risk of failure and an expectation of low earnings.

Several recent studies for the Ontario Culture Human Resource Council have indicated there is an impending shortage of skilled workers in the Ontario culture sector. One report⁵ highlighted that many of the sub-sectors require knowledge of computer, business and entrepreneurial skills. Moreover, it anticipates a shortage of senior managers in both the private and non-profit cultural areas. Diminishing resources have necessitated leaner workforces and have resulted in fewer opportunities for human resource training and development. According to another report⁶, in any given year, a number of graduates of culture fields of study are ready to enter the culture labour force but lack the practical experience that increases employability and earning power. As well, the transition to the culture labour force is highly dependent on one's ability to establish professional credibility and rapport with colleagues.⁷ Strategies aimed at assisting young individuals to make the transition from school to work are vital for replenishing the culture labour force and addressing the apparent skill shortage.

Arts and/or culture fields of study chosen for this study are based on the Canadian Framework for Culture Statistics. They include: fine arts, music, performing arts, dance, drama, industrial design, applied arts, advertising, commercial arts, photography, recorded music production, printing and publishing, jewellery design, fashion design, graphic and other audio-visual arts, interior decorating, mass communications, cinematography and film animation, radio and television broadcasting, English, French and other language literature, journalism, translation and interpretation, library and record sciences, archival sciences, architectural design and drafting, architecture and landscape architecture.

While a successful career in the sector may be measured a number of ways, earnings data show that most culture occupations are ranked in the bottom half (averaging less than \$30,000 annually) of all types of earners in Canada.⁸ It is a major challenge, therefore, for human resource managers in the culture sector to attract new talent and highly skilled individuals when the financial rewards may not be high. The culture sector must compete with other sectors of the economy for the recruitment and the retention of new graduates with specialized skills and knowledge.

The culture labour force has not been immune to the effects of the aging of the Canadian workforce. During the 1990s the age distribution of culture and other workers continued to change as the front edge of the enormous baby boom generation moved toward middle age. By the

end of that decade, 5 out of 10 culture workers were between the ages of 35 and 54.⁹ Not only are there fewer young people today available to enter the labour force but they are more likely to remain in the educational system longer than in previous years. These patterns reflect the demographic trends being experienced by the entire labour force in this period. Consequently, the culture sector is concerned about who will be able to replenish their highly skilled workforce. Where are the new graduates going? What kinds of employment are they finding? Is the culture sector gaining access to a reasonable share of new graduates from postsecondary education institutions? How large is the pool of graduates?

The National Graduates Survey (NGS) sheds light on new arts and culture graduates entering the labour market.¹⁰ In general, NGS data show that the class of 1990 had good success in the labour market in the five years after graduation. In fact, most graduates from the class of 1990 were working full time two years after graduation and continued their labour market success into the mid-1990s. Research using the NGS¹¹ concludes that unemployment rates of male and female 1990 graduates at all levels of postsecondary education have been lower than those of non-graduates and improved significantly between two and five years following graduation. What was the situation for arts and culture graduates? Were they as successful in the workplace as other postsecondary school graduates and were they able to find work in their chosen professions?

Statistics Canada, in partnership with Human Resources Development Canada, has conducted the National Graduates Survey since 1982. The survey was designed to obtain longitudinal data on the relationships between postsecondary education, training and labour market activities, the long-term labour market experiences of graduates, earnings and occupations and graduates' additional educational experiences and qualifications. To date the NGS databases consist of large samples of Canadian postsecondary students who successfully completed their community college or university programs in 1982, 1986, 1990 and 1995. Each cohort was interviewed two and five years after graduation in order to collect information about the educational experiences and early labour market outcomes for individuals within the group. This article examines the school-to-work transition for the 1990 arts and culture graduate cohort based on data collected in 1992 and 1995. The survey tracks job spells, changing working conditions and overall employment outcomes. Of note, however, is that the NGS did not survey many of the national arts training schools such as the National Ballet School, The National Theatre School, etc. The result is a sample of culture graduates mainly found in large universities and colleges.



Table 1
Characteristics of the class of 1990, by field of study and level of study, Canada

Characteristics	University graduates		Trade, vocational and college graduates	
	Culture fields of study	All other fields of study	Culture fields of study	All other fields of study
	number			
Number of graduates	14,337	122,464	8,490	100,544
	%			
Age distribution				
19–29	76.1	77.1	83.5	73.3
30–39	13.1	15.3	11.0	18.5
40 and older	10.9	7.6	5.5	8.2
Gender distribution				
Males	31.3	40.4	45.9	43.9
Females	68.7	59.6	54.1	56.1
Prior job experience				
% had job in culture profession prior to graduation for 6 months or more	4.2	n.r.	4.8	n.r.
% had job in culture industry prior to graduation for 6 months or more	5.5	1.6	4.4	1.5
Schedule of studies				
% full time	70.6	73.1	91.6	90.6
% part time	9.6	10.9	n.r.	5.3
% both	19.9	16.0	n.r.	4.2
Extent of satisfaction with program				
<i>Program provided in-depth knowledge of subject area</i>				
To a great or some extent	92.7	91.3	92.7	93.6
Not very much or not at all	7.3	8.7	7.3	6.4
<i>Program provided skills needed for a particular job</i>				
To a great or some extent	75.4	82.4	85.7	90.7
Not very much or not at all	24.6	17.6	14.3	9.3
<i>Program provided knowledge about career opportunities</i>				
To a great or some extent	49.9	63.5	72.5	82.2
Not very much or not at all	50.1	36.5	27.5	17.8
<i>Opportunity to use and learn new technologies</i>				
Yes	45.0	44.0	47.0	45.0
No	55.0	56.0	53.0	55.0
<i>Would have selected the same field of study after experiences</i>				
Yes	71.8	73.3	74.5	74.6
No	29.2	26.7	25.5	25.4
	\$			
Labour force status June 1992				
Average annual personal income	22,247	29,246	17,672	22,159
Median annual personal income	18,000	30,000	16,000	20,000
	%			
% self-employed	7.7	5.0	9.1	3.6
% working in culture occupations	20.9	1.3	29.6	0.8
% working in culture industries	21.5	4.9	31.3	4.1
<i>Job and education relationship</i>				
Directly related	33.3	40.8	39.9	51.0
Partially related	52.2	51.2	39.6	37.3
Indirectly related	14.5	8.0	20.5	11.7
	\$			
Labour force status June 1995				
Average annual personal income	30,533	37,935	23,541	27,595
Median annual personal income	27,000	37,000	23,000	25,000
	%			
% self-employed	13.6	8.8	14.4	6.5
% with more than one job	12.9	9.6	12.8	10.6
% working in culture occupations	11.2	1.1	14.3	n.r.
% working in culture industries	22.0	5.2	28.9	3.7
<i>Job and education relationship</i>				
Directly related	28.4	35.3	28.6	43.1
Partially related	60.1	58.9	50.8	45.0
Indirectly related	11.6	5.8	20.6	11.9
% of graduates who went back to school between 1990 and 1992	18.3	14.3	10.5	10.8
% of graduates who went back to school between 1992 and 1995	26.0	25.0	20.0	20.0

Note:

n.r. Not reliable.

Source: National Graduates Survey.



Table 2

1990 culture graduates more likely to occupy temporary jobs in 1992 and 1995

Characteristics	Culture university graduates	Culture trade, vocational and college graduates	All culture graduates	Other university graduates	Other trade, vocational and college graduates	All other graduates
	%					
% working in 1992	79	80	79	85	83	84
% working in 1995	84	84	84	90	86	88
% occupying temporary jobs in 1992	37	24	30	24	19	20
% occupying temporary jobs in 1995	24	17	18	17	13	14
Job mobility between June 1992 and June 1995						
Same employer in 1992 and 1995	35	35	35	49	47	48
Same employers in 1992 and 1995 but not continuous	n.r.	n.r.	n.r.	2	13	2
Different employers	33	35	34	28	27	28
Not employed in 1992 but employed in 1995	14	12	14	11	11	11
Not employed in 1995	16	16	16	10	14	12

Note:

n.r. Not reliable.

Source: National Graduates Survey.

Who are the culture graduates?

Of the 23,000 culture graduates in the class of 1990, about 62% graduated from a university and 38% graduated from a trade or vocational school or a college. Similar to graduates of other fields, females outnumbered males among university graduates (69%) and trade, vocational and college graduates (54%) in 1990. Two and five years after graduation, culture graduates were more likely than other graduates to be moonlighting, be self-employed, have changed employers or have found temporary work (see tables 1 and 2). Culture graduates indicated overwhelmingly that they would choose to take the same studies again given their experiences (over 70%) and agreed that their studies gave them an in-depth knowledge of their particular field and the skills needed for a job (over 90%). In addition, about 46% of culture graduates reported they had the opportunity to use and learn new technologies at their place of work.

Most culture graduates were working two and five years later

Of all the arts and culture graduates in 1990, 79% were working in 1992 with an increase in employment levels to 84% in 1995 (see Table 2). Labour market success depends on many factors, including academic achievement, previous work experience, and the prevailing economic climate. If any of these factors are unfavourable, entry into the labour market may be difficult. The class of 1990 faced adverse economic conditions due to the recession in effect at the time of their graduation. Overall, however, graduates of all fields of study were largely successful in

finding employment. Culture graduates compared favourably with the 84% of the 223,000 non-culture graduates who were working in 1992 and the 88% who were employed in 1995. While the majority of culture graduates were working in 1992 and 1995 in a variety of areas, the characteristics of that work differed from that of other types of graduates.

Culture graduates more likely to hold temporary jobs than other graduates

For many graduates, 1992 was a difficult year to find permanent employment¹². Poor labour market conditions weakened employment opportunities for all 1990 postsecondary graduates. In 1992, 37% of university culture graduates were able to find only temporary work compared to 24% of university graduates from other fields of study. Although trade, vocational and college graduates had more success at finding permanent employment, 24% of culture graduates were dependent on temporary work in contrast to 19% of their contemporaries who graduated from other fields of study.

Improvements were seen in 1995 when the overall percentage of the class of 1990 (all graduates) who occupied temporary positions dropped compared with 1992 (Table 2). However, this improvement may reflect the fact that some individuals left the labour market to return to school, rather than success at obtaining permanent employment. Close to 25% of all university graduates, including 26% from culture studies, returned to school between 1992 and 1995. College, trade and vocational arts and culture graduates were less likely to go back to school (only 20%) than university arts and culture

graduates. It may be that, in the early nineties, employers found practical training more advantageous than other types of postsecondary training.

There may be a stronger relationship with permanent work when culture graduates were able to find work in the culture sector itself. For those culture graduates who did find work in the culture sector, a majority (85%) was able to obtain permanent jobs.

The relationship between the field of study of graduates and their current job requires the examination of two main factors: the nature of their jobs (occupation or profession) and the type of business they work for (industry). In order to do this we must pre-determine which industries or businesses are part of our definition of culture industries and which occupations or professions are culture related. We can then use these classification tools to gather information on where arts/culture graduates worked.

Income patterns different for culture graduates

The income level of workers has long been an issue of concern in the culture sector. In 1995, university culture graduates from the class of 1990 earned, on average, only \$30,500 compared to the entire class of university-level graduates who earned, on average, \$39,150. That same year the mean income of culture college, trade and vocational graduates was slightly less than \$25,500 while all college, trade and vocational graduates earned, on average, \$29,600.¹³ Not surprisingly, fine arts graduates were among the lowest earners and engineers and health science graduates were the top earners among all college and university graduates in 1995 (Table 1).¹⁴

Where do recent arts and culture graduates work?

Overall, the culture labour force showed high growth during the nineties. If one counts only individuals in culture occupations we see that their numbers grew at a faster rate (+23% versus +11%)¹⁵ than the overall labour force between 1990 and 1999. In large part, this growth was due to strong increases in part time and self-employment among culture workers. The number of jobs available in culture industries also increased by 26% over the same period.

Self-employment was generally a very strong factor in employment growth throughout the nineties whereby it accounted for over three-quarters of job growth. Some research has shown that entering into self-employment is often the way that individuals, particularly women, respond to unemployment or the unavailability of full-time work.¹⁶ The number of self-employed in the overall culture labour

force is usually quite high (over 30% of total culture employment). Yet new graduates may find it particularly difficult to enter the labour market as a self-employed worker. This is because starting your own business requires financial resources and/or contacts in the sector that new entrants rarely have. Even so arts and culture graduates were significantly more likely to be self-employed in both 1992 and 1995 than were other graduates.¹⁷ About 8% of new arts and culture graduates were self-employed two years after graduation, a figure which rose to 13% by five years after graduation. In comparison, only about 4% of new graduates in other fields of study were self-employed in 1992 although this proportion rose to 8% by 1995.

Labour Force Survey data show that the culture sector is a fast growing segment of the workforce. Within this cohort (i.e., the class of 1990), it is interesting to note that college, trade and vocational culture graduates who generally receive more practical, apprenticeship training, only about 29% were working in any culture industry in 1995. Similarly, only about 22% of culture university graduates were working in culture industries that year. Of the culture graduates who changed employers between 1992 and 1995, about 14% went from one culture industry in 1992 to another in 1995, while 23% moved between a culture industry and non-culture industry and the majority (62%) went from one non-culture industry to another. It is important to keep in mind that the labour force experiences of this cohort may be different than the experiences of other graduate classes. Moreover, we cannot determine if these culture graduates are volunteering or have secondary jobs in the culture sector.¹⁸

Strength of ties to employers

There is a notable difference in the length of time graduates stayed with employers during their initial five years after graduation. While almost half (49%) of non-culture university graduates kept the same employer through five years after graduation (Table 1) only 35% of culture university graduates stayed with the same employer over the same period. Almost exactly the same pattern and percentages can be seen for graduates of trade, vocational and college studies.

Weak link between studies and employment

Survey respondents were also asked how closely their current job related to their studies. In 1992 and 1995, culture graduates were less likely to respond that they were directly related than did graduates of other programs. About 33% of university culture graduates indicated their job was directly related, compared with 41% for other graduates. Similarly, 40% of trade, vocational and college culture

graduates indicated their job was directly related to their training, compared with 51% for other graduates. The relationship between education and current employment also appears to have weakened by 1995. That year, fewer than 30% of culture graduates responded that their job was directly related to their studies.

Overall, these results demonstrate that the majority of recent graduates of arts and culture programs did not find work in their chosen field. This is confirmed by data from the Labour Force Survey that, throughout the nineties, less than half the individuals in culture occupations could be found in select culture industries. Instead they appear to have found employment in other industries that may have valued their education and skills more. This issue should have significance for those who are concerned about the future health and vitality of the Canadian culture sector and the ability of young culture graduates to work in their chosen fields.

Notes

1. See definition in text box of arts and culture graduates. The terms 'arts and culture graduates' and 'culture graduates' are used interchangeably.
2. See Luffman, Jacqueline. 2000. "Culture workers increasing." *Focus on Culture*. Statistics Canada, Catalogue no. 87-004-XPB, Vol. 12, No. 2; Cheney, Terry. 1998. "Managing the Culture Labour Force in the 21st Century", *International Journal of Arts Management*, Volume 1, No.1; and Editor, 1995. "The Cultural Labour Force", *Focus on Culture*, Vol. 7, No. 3.
3. Culture occupations consist of a list of 43 occupations classified using the 1991 Standard Occupational Classification System. Similarly, culture industries consist of a group of 13 categories classified by the North American Industrial Classification System. The occupations and industries were chosen based on the *Canadian Framework for Culture Statistics* (Culture Statistics Program, Statistics Canada) and are used by other culture labour force researchers.
4. Editor, 1995. "The Cultural Labour Force", Ibid.
5. Yi-Leu, Du. September 1998. "Strategic Skills Shortages in Ontario's Cultural Sector." Prepared for the Ontario Cultural Human Resource Council. Genovese Vanderhoof & Associates.
6. Yi-Leu, Du., May 1998. "Proposal for Effective and Efficient Training for Ontario's Cultural Industry." Prepared for the Ontario Cultural Human Resource Council. Genovese Vanderhoof & Associates. Page 6.
7. Yi-Leu, Du. Ibid. Available at www.workinculture.on.ca (accessed May 16, 2001). Page 7.
8. Luffman, Jacqueline. 2000. "Earnings of selected culture workers: what the 1996 Census can tell us." *Focus on Culture*, Vol. 12, No. 1.
9. Culture Statistics Program, Statistics Canada, 2000. *Canadian Culture in Perspective: A Statistical Overview*. Catalogue no. 87-211-XPB. This proportion of workers between the ages of 35 and 54 is the same as that found in the labour force as a whole. See Statistics Canada, Labour Force Survey, Annual Averages.
10. Measuring culture labour markets is challenging for researchers. Definitions of the term "arts and culture" or "culture" occupations can be subjective and arbitrary. Often the available data does not match the desired area of study and use of secondary data is difficult because one is confined to using a pre-determined definition of "culture". Even so, the National Graduates Survey (NGS) provides an interesting opportunity to test the limitations of occupational and industrial mechanisms commonly used to define and capture data on culture workers.
11. Finnie, Ross. 2000. "Holding their own: Employment and earnings of postsecondary graduates". *Education Quarterly Review*, Vol. 7, No. 1, p. 31. Statistics Canada, Catalogue no. 81-003.
12. A permanent job is one that is expected to last as long as the employee wants it, given that business conditions permit. That is, there is no pre-determined termination date. A temporary job has a predetermined end date, or will end as soon as a specified project is completed. (*Source Guide to the Labour Force Survey*, Statistics Canada, available free at www.statcan.ca).
13. The calculations to determine these average annual earnings for culture and non-culture graduates do not distinguish between number of hours worked or temporary versus permanent.

14. Paju, Mike. 1997. "The class of '90 revisited: 1995 follow-up of 1990 graduates". *Education Quarterly Review*, Vol. 4, No. 4.
15. Luffman, 2000. Ibid.
16. Lin, Yates and Picot, 1998. "The Entry and Exit Dynamics of Self-Employment in Canada." Business and Labour Market Analysis Division, Statistics Canada.
17. A chi square test was performed to determine the strength of the association between self-employment and field of study (i.e. culture versus non-culture fields of study). In both 1992 and 1995, the chi square test showed that the difference in proportions is significant ($X^2=471$, $p<.001$ and $X^2=760$, $p<.001$).
18. The NGS only collected information on an individual's primary job. While the survey reports if the graduate had other jobs in addition to their main paid employment one cannot determine what or where the secondary job(s) were.

announcements

Data releases

In the section “Data releases” we provide the titles of data released by the Centre for Education Statistics since the publication of the previous issue of Education Quarterly Review. Details on each release can be accessed free-of-charge from Statistics Canada’s website www.statcan.ca. Click on “The Daily” and “Previous issues”.

- Children and youth at risk: Symposium report; Catalogue no. 81-589-XIE (released May 22, 2001)
- Education in Canada, 2000; Catalogue no. 81-229-XPB/XIB (released May 22, 2001)
- A report on adult education and training in Canada: Learning a living, 1998; Catalogue no. 81-586-XIE (released May 10, 2001)
- Survey of approaches to educational planning, 1999 (released April 10, 2001) EQR



Current data

Data series	Most recent data	
	Final ¹	Preliminary or estimate ²
A. Elementary/secondary		
Enrolment in public schools	1998–1999	1999–2000 ^e 2000–2001 ^e
Enrolment in private schools	1998–1999	1999–2000 ^e
Enrolment in minority and second language education programs	1998–1999	
Secondary school graduation	1998–1999	
Educators in public schools	1998–1999	1999–2000 ^e 2000–2001 ^e
Educators in private schools	1997–1998	1998–1999 ^e 1999–2000 ^e
Elementary/secondary school characteristics	1998–1999	1999–2000 ^e
Financial statistics of school boards	1997–1998	
Financial statistics of private academic schools	1995–1996	1996–1997 ^P
Federal government expenditures on elementary/secondary education	1997–1998	1998–1999 ^P 1999–2000 ^e
Consolidated expenditures on elementary/secondary education	1997–1998	1998–1999 ^P 1999–2000 ^e
Education Price Index	1998	
B. Postsecondary		
University enrolments	1998–1999	discontinued
University degrees granted	1998	discontinued
University continuing education enrolment	1996–1997	discontinued
Educators in universities	1998–1999	1999–2000 ^e
Salaries and salary scales of full-time teaching staff at Canadian universities	1999–2000	
Tuition and living accommodation costs at Canadian universities	2000–2001	
University finance	1997–1998	1998–1999 ^P 1999–2000 ^e
College finance	1997–1998	1998–1999 ^P 1999–2000 ^e
Federal government expenditures on postsecondary education	1997–1998	1998–1999 ^P 1999–2000 ^e
Consolidated expenditures on postsecondary education	1997–1998	1998–1999 ^P 1999–2000 ^e
Community colleges and related institutions: enrolment and graduates	1998–1999	1999–2000 ^e
Trade/vocational enrolment	1998–1999	1999–2000 ^e

See notes at end of this table.



Current data (concluded)

Data series	Most recent data	
	Final ¹	Preliminary or estimate ²
College/trade teaching staff	1997–1998	1998–1999 ^P
International student participation in Canadian universities	1998–1999	

C. Publications³

Education in Canada (2000)

South of the Border: Graduates from the class of '95 who moved to the United States (1999)

Leaving school (1993)

After High School, the First Years (1996)

Adult education and training survey (1995)

A report on adult education and training in Canada: Learning a living (1998)

International student participation in Canadian education (1993–1995)

Education Price Index – methodological report

Handbook of education terminology: elementary and secondary level (1994)

Guide to data on elementary secondary education in Canada (1995)

A Guide to Statistics Canada Information and Data Sources on Adult Education and Training (1996)

A Statistical Portrait of Elementary and Secondary Education in Canada – Third edition (1996)

A Statistical Portrait of Education at the University Level in Canada – First edition (1996)

The Class of '90: A compendium of findings (1996)

The Class of '90 Revisited (1997)

The Class of '95: Report of the 1997 National Survey of 1995 Graduates (1999)

Education indicators in Canada: Report of the Pan-Canadian Indicators Program (1999)

Education at a Glance: OECD Indicators (2000)

Literacy, Economy and Society (1995)

Literacy Skills for the Knowledge Society (1997)

Literacy in the Information Age (2000)

International Adult Literacy Survey Monograph Series

Benchmarking Adult Literacy in North America: An International Comparative Study (2001)

Growing Up in Canada: National Longitudinal Survey of Children and Youth (1996)

Children and youth at risk: Symposium report

Notes:

1. Indicates the most recent calendar year (e.g., 1993) or academic/fiscal year (e.g., 1993–1994) for which final data are available for all provinces and territories.
2. Indicates the most recent calendar year (e.g., 1995) or academic/fiscal year (e.g., 1996–1997) for which any data are available. The data may be preliminary (e.g., 1995^P), estimated (e.g., 1995^E) or partial (e.g., data not available for all provinces and territories).
3. The year indicated in parentheses denotes the year of publication. Some of these publications are prepared in co-operation with other departments or organizations. For information on acquiring copies of these reports, please contact Client Services, Culture, Tourism and the Centre for Education Statistics. Telephone: (613) 951-7608, toll free 1 800 307-3382; Fax: (613) 951-9040 or E-mail: educationstats@statcan.ca.



Advance statistics

This section summarizes data on institutions, teachers, enrolment, degrees and finance at all levels of education in Canada. Unless otherwise indicated, actual figures are given for 1998–1999, preliminary figures for 1999–2000 and estimates for 2000–2001. Financial statistics are shown in current dollars for 1997–1998 to 2000–2001. For further information, please contact Client Services, Culture, Tourism and the Centre for Education Statistics, at (613) 951-7608, toll-free 1 800 307-3382, or by fax at (613) 951-9040.

Enrolment

- In the fall of 2000, an estimated 522,000 children enrolled in the pre-elementary level, up 5,000 from the fall of 1999. Enrolment in grades 1 to 12 was expected to be 4.9 million, up about 4,000 from the previous year.
- Full-time postsecondary community college enrolment was estimated to decrease slightly in 2000–2001 by 0.1% from the previous year, to reach 404,400.

Teachers

- The number of full-time elementary and secondary teachers reached 304,200 in 2000–2001, up 0.8% from the previous year.

Finance


- In 2000–2001, total education expenditures are expected to reach \$66.3 billion, an increase of 0.2% over 1999–2000.
- In 2000–2001, about 82% of the education bill will be paid by the three levels of government; the remainder through fees and other private sources.
- The elementary and secondary level is expected to account for approximately 60% of total education spending in 2000–2001. The postsecondary and vocational training levels will make up about 27% and 13%, respectively. 



Table 1
Institutions, enrolments and teachers, 1998–1999 to 2000–2001

	Institutions			Enrolments					Full-time teachers		
	Elementary/secondary ¹	Community colleges ²	Universities	Pre-elementary ¹	Elementary/secondary ¹	Full-time post-secondary community college ³	Full-time university ⁴	Part-time university	Elementary/secondary ¹	Post-secondary community colleges ⁵	Universities ⁶
	number										
Canada											
1998–1999	15,637	198	75	511,251	4,856,116	403,516	580,376	245,985	300,261	31,234 ^P	33,667 ^e
1999–2000 ^c	15,624	198	..	517,064	4,862,342	404,983	..	..	301,757	31,353	..
2000–2001	15,602	198	..	522,050	4,866,745	404,440	..	..	304,232	..	..
Newfoundland											
1998–1999	372	2	1	5,935	92,194	5,973	13,115	2,595	6,418	673 ^P	854
1999–2000 ^c	353	2	..	5,692	88,875	6,023	..	..	6,195	680	..
2000–2001	334	2	..	5,380	85,727	6,041	..	..	5,983	..	..
Prince Edward Island											
1998–1999	71	2	1	43	24,398	1,899	2,470	417	1,389	81 ^P	179
1999–2000 ^c	72	2	..	49	24,391	1,918	..	..	1,396	82	..
2000–2001	72	2	..	1,758	24,380	1,930	..	..	1,408	..	..
Nova Scotia											
1998–1999	512	5	12	11,826	151,296	7,039	30,027	7,214	9,518	755 ^P	1,914
1999–2000 ^c	510	5	..	11,701	150,460	7,099	..	..	9,473	763	..
2000–2001	509	5	..	11,533	149,736	7,085	..	..	9,516	..	..
New Brunswick											
1998–1999	384	5	5	9,082	121,719	5,221	18,529	4,237	7,490	877 ^P	1,145
1999–2000 ^c	374	5	..	8,989	119,995	5,248	..	..	7,394	886	..
2000–2001	364	5	..	8,865	118,348	5,275	..	..	7,313	..	..
Quebec											
1998–1999	3,002	89	7	94,473	1,030,593	164,469	134,162	98,116	68,651	12,717 ^P	8,046 ^e
1999–2000 ^c	2,996	89	..	95,106	1,027,079	164,904	..	..	69,542	12,717	..
2000–2001	2,990	89	..	94,816	1,024,434	164,648	..	..	70,347	..	..
Ontario											
1998–1999	5,474	40	21	264,933	1,863,709	142,341	229,985	72,958	117,098	6,858 ^P	12,412 ^e
1999–2000 ^c	5,458	40	..	270,500	1,862,767	142,715	..	..	116,541	6,858	..
2000–2001	5,438	39	..	274,791	1,858,949	142,482	..	..	116,447	..	..
Manitoba											
1998–1999	858	6	6	17,964	204,628	4,181	20,883	9,852	12,520	728 ^P	1,501
1999–2000 ^c	862	6	..	17,586	205,411	4,223	..	..	12,495	735	..
2000–2001	864	6	..	17,078	206,392	4,212	..	..	12,473	..	..
Saskatchewan											
1998–1999	903	4	4	15,881	193,887	2,740	23,656	7,622	11,514	856 ^P	1,390
1999–2000 ^c	894	4	..	15,716	193,600	2,768	..	..	11,646	865	..
2000–2001	886	4	..	15,453	193,322	2,781	..	..	11,810	..	..
Alberta											
1998–1999	1,862	19	10	40,625	525,736	31,999	53,510	20,263	29,999	3,350 ^P	3,009 ^e
1999–2000 ^c	1,879	19	..	41,154	530,871	32,201	..	..	30,919	3,384	..
2000–2001	1,889	19	..	41,743	536,120	32,150	..	..	32,256	..	..
British Columbia											
1998–1999	2,080	24	8	48,541	625,405	37,127	54,039	22,711	33,899	4,150 ^P	3,217
1999–2000 ^c	2,103	24	..	48,618	636,215	37,342	..	..	34,385	4,192	..
2000–2001	2,134	24	..	48,669	646,160	37,288	..	..	34,895	..	..
Yukon											
1998–1999	28	1	–	460	5,739	258	–	–	419	59 ^P	–
1999–2000 ^c	28	1	–	454	5,843	265	–	–	417	61	–
2000–2001	28	1	–	456	5,961	271	–	–	415	..	–
Northwest Territories											
1998–1999	89	1	–	1,459	16,582	269	–	–	1,328	76 ^P	–
1999–2000 ^c	51	1	–	744	9,120	110	–	–	1,338	76	–
2000–2001	50	1	–	748	9,107	98	–	–	1,354	..	–
Nunavut											
1998–1999	..	..	..	..	..	..	..	..	..	54 ^P	..
1999–2000 ^c	42	1	..	727	7,462	167	..	..	..	54	..
2000–2001	42	1	..	732	7,832	179	..	..	..	..	..
Department of National Defence, Overseas											
1998–1999	2	–	–	29	230	–	–	–	18	–	–
1999–2000 ^c	2	–	–	28	253	–	–	–	16	–	–
2000–2001	2	–	–	28	277	–	–	–	15	–	–

Notes:

.. Figures not available.

– Nil or zero.

1. These data are estimates and include public, private, federal and overseas schools and schools for the visually and hearing impaired.

2. The number of institutions does not include campuses, which previously had been reported in Education Quarterly Review for some of the provinces.

3. Includes postsecondary enrolments in community colleges, CEGEPS, nursing and hospital schools and other related institutions.

4. Regular winter session only.

5. Includes community college teachers at the trade level.

6. Includes only those with 12-month terms of appointment.



Table 2
Degrees, by level and sex of recipient, 1997 to 1999

	Bachelor's and first professional degrees			Master's degrees			Earned doctorates		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
	number								
Canada									
1997	51,782	74,014	125,796	10,461	10,858	21,319	2,543	1,423	3,966
1998	51,268	73,593	124,861	10,514	11,512	22,026	2,540	1,436	3,976
1999	..	..	..	..	..	..	..	..	..
Newfoundland									
1997	935	1,239	2,174	130	142	272	28	4	32
1998	926	1,281	2,207	134	155	289	21	8	29
1999	..	..	..	..	..	..	..	..	..
Prince Edward Island									
1997	179	335	514	5	1	6	–	–	–
1998	122	263	385	1	2	3	–	–	–
1999	..	..	..	..	..	..	..	..	..
Nova Scotia									
1997	2,465	3,517	5,982	431	558	989	55	26	81
1998	2,440	3,639	6,079	398	496	894	54	33	87
1999	..	..	..	..	..	..	..	..	..
New Brunswick									
1997	1,458	2,060	3,518	202	206	408	31	7	38
1998	1,380	1,930	3,310	166	200	366	19	8	27
1999	..	..	..	..	..	..	..	..	..
Quebec									
1997	11,484	17,299	28,783	3,241	3,335	6,576	752	391	1,143
1998	11,409	16,021	27,430	3,256	3,513	6,769	759	413	1,172
1999	..	..	..	..	..	..	..	..	..
Ontario									
1997	22,265	31,722	53,987	4,254	4,204	8,458	1,006	573	1,579
1998	21,859	32,171	54,030	4,277	4,568	8,845	981	566	1,547
1999	..	..	..	..	..	..	..	..	..
Manitoba									
1997	2,117	2,883	5,000	279	277	556	73	40	113
1998	2,021	2,752	4,773	241	286	527	72	35	107
1999	..	..	..	..	..	..	..	..	..
Saskatchewan									
1997	1,674	2,252	3,926	262	210	472	83	20	103
1998	1,667	2,316	3,983	266	241	507	64	25	89
1999	..	..	..	..	..	..	..	..	..
Alberta									
1997	4,446	6,165	10,611	649	858	1,507	227	173	400
1998	4,495	6,276	10,771	704	874	1,578	254	165	419
1999	..	..	..	..	..	..	..	..	..
British Columbia									
1997	4,759	6,542	11,301	1,008	1,067	2,075	288	189	477
1998	4,949	6,944	11,893	1,071	1,177	2,248	316	183	499
1999	..	..	..	..	..	..	..	..	..
Yukon									
1997	..	..	..	..	..	..	..	..	..
1998	..	..	..	..	..	..	..	..	..
1999	..	..	..	..	..	..	..	..	..
Northwest Territories									
1997	..	..	..	..	..	..	..	..	..
1998	..	..	..	..	..	..	..	..	..
1999	..	..	..	..	..	..	..	..	..
Nunavut									
1997	..	..	..	..	..	..	..	..	..
1998	..	..	..	..	..	..	..	..	..
1999	..	..	..	..	..	..	..	..	..

Notes:

.. Figures not available.

– Nil or zero.



Table 3
Expenditures on education, by direct source of funds, 1997–1998 to 2000–2001

	Total	Local governments	Provincial and territorial governments	Federal government ¹	Non-governmental (private) sources
	\$ thousands				
Canada					
1997–1998	62,026,694	12,840,941	31,941,188	6,667,568	10,576,997
1998–1999 ^P	65,478,810	9,230,431	39,226,935	5,738,792	11,282,652
1999–2000 ^C	66,096,483	9,597,576	39,056,937	5,880,671	11,561,299
2000–2001 ^E	66,256,410	9,893,292	38,987,348	5,610,368	11,765,402
Newfoundland					
1997–1998	1,313,685	–	720,266	426,930	166,489
1998–1999 ^P	1,149,394	–	753,660	222,556	173,178
1999–2000 ^C	1,167,872	–	757,516	232,706	177,650
2000–2001 ^E	1,168,135	–	763,138	223,819	181,178
Prince Edward Island					
1997–1998	262,595	–	166,942	57,552	38,101
1998–1999 ^P	255,839	–	179,353	33,258	43,228
1999–2000 ^C	246,827	–	173,901	32,505	40,421
2000–2001 ^E	253,809	–	181,060	31,486	41,263
Nova Scotia					
1997–1998	1,708,685	139,305	985,353	276,648	307,379
1998–1999 ^P	1,840,908	144,184	1,131,931	220,049	344,744
1999–2000 ^C	1,871,434	147,493	1,136,242	233,054	354,645
2000–2001 ^E	1,855,404	150,063	1,102,789	224,552	378,000
New Brunswick					
1997–1998	1,495,653	–	1,085,445	229,136	181,072
1998–1999 ^P	1,474,210	63	1,103,962	165,417	204,768
1999–2000 ^C	1,550,374	63	1,165,163	175,211	209,937
2000–2001 ^E	1,566,505	63	1,180,136	167,400	218,906
Quebec					
1997–1998	14,177,341	926,505	9,676,585	1,329,201	2,245,050
1998–1999 ^P	14,916,774	1,015,395	10,433,353	1,258,573	2,209,453
1999–2000 ^C	15,528,549	1,112,827	10,838,588	1,292,497	2,284,637
2000–2001 ^E	15,868,534	1,219,229	11,065,913	1,240,244	2,343,148
Ontario					
1997–1998	23,671,958	8,055,100	9,579,610	1,860,779	4,176,469
1998–1999 ^P	25,636,086	4,350,675	15,130,766	1,595,195	4,559,450
1999–2000 ^C	25,029,753	4,516,135	14,148,872	1,643,775	4,720,971
2000–2001 ^E	24,279,727	4,616,143	13,320,523	1,589,789	4,753,272
Manitoba					
1997–1998	2,416,083	559,939	1,106,189	417,806	332,149
1998–1999 ^P	2,549,316	579,116	1,226,470	379,247	364,483
1999–2000 ^C	2,644,808	602,521	1,274,171	384,568	383,548
2000–2001 ^E	2,742,671	633,782	1,344,650	378,997	385,242
Saskatchewan					
1997–1998	2,212,350	552,987	959,733	447,097	252,533
1998–1999 ^P	2,282,994	566,314	1,018,638	430,002	268,040
1999–2000 ^C	2,325,435	597,212	1,055,357	414,329	258,537
2000–2001 ^E	2,416,923	629,175	1,115,094	405,026	267,628
Alberta					
1997–1998	5,903,227	1,360,704	2,788,505	561,165	1,192,853
1998–1999 ^P	6,423,402	1,290,442	3,264,099	500,705	1,368,156
1999–2000 ^C	6,714,155	1,302,689	3,506,286	520,160	1,385,020
2000–2001 ^E	6,876,906	1,315,456	3,637,047	510,772	1,413,631

See notes at end of table.



Table 3
Expenditures on education, by direct source of funds, 1997–1998 to 2000–2001 (concluded)

	Total	Local governments	Provincial and territorial governments	Federal government ¹	Non-governmental (private) sources
	\$ thousands				
British Columbia					
1997–1998	8,209,085	1,235,495	4,497,700	809,273	1,666,617
1998–1999 ^P	8,324,220	1,273,021	4,616,451	707,953	1,726,795
1999–2000 ^e	8,350,141	1,306,872	4,612,395	705,258	1,725,616
2000–2001 ^e	8,638,243	1,316,996	4,871,543	687,745	1,761,959
Yukon					
1997–1998	111,808	272	97,342	5,998	8,196
1998–1999 ^P	105,545	240	92,695	6,029	6,581
1999–2000 ^e	110,811	272	97,391	6,075	7,073
2000–2001 ^e	107,865	272	96,824	3,404	7,365
Northwest Territories					
1997–1998	300,339	10,634	277,518	2,132	10,055
1998–1999 ^P	301,894	10,981	275,557	2,561	12,795
1999–2000 ^e	191,876	6,071	172,857	2,731	10,217
2000–2001 ^e	205,645	6,727	187,036	1,156	10,726
Nunavut					
1997–1998	..	..	..	..	..
1998–1999 ^P	..	..	..	..	..
1999–2000 ^e	125,685	5,421	118,198	80	1,986
2000–2001 ^e	129,072	5,386	121,595	80	2,011
Other²					
1997–1998	243,885	–	–	243,851	34
1998–1999 ^P	218,228	–	–	217,247	981
1999–2000 ^e	238,763	–	–	237,722	1,041
2000–2001 ^e	146,971	–	–	145,898	1,073

Notes:

.. Figures not available.

– Nil or zero.

1. Excludes federal contributions to provincial governments for Official Languages in Education programs and for postsecondary education under Established Program Financing.
2. Includes Canada's spending on education in foreign countries and undistributed expenditures.



Table 4
Expenditures on education, by level, 1997–1998 to 2000–2001

	Total	Elementary– secondary ¹	Postsecondary ²			Trade level ³
			Community college	University	Subtotal	
\$ thousands						
Canada						
1997–1998	62,026,694	37,163,556	4,689,529	12,220,255	16,909,784	7,953,354
1998–1999 ^P	65,478,810	39,638,983	4,782,730	12,808,431	17,591,161	8,248,666
1999–2000 ^C	66,096,483	38,545,178	5,100,948	13,662,932	18,763,880	8,787,425
2000–2001 ^C	66,256,410	39,495,043	4,923,230	13,168,272	18,091,502	8,669,865
Newfoundland						
1997–1998	1,313,685	564,714	36,542	239,010	275,552	473,419
1998–1999 ^P	1,149,394	583,394	40,760	249,319	290,079	275,921
1999–2000 ^C	1,167,872	555,186	46,769	267,163	313,932	298,754
2000–2001 ^C	1,168,135	544,303	50,595	272,164	322,759	301,073
Prince Edward Island						
1997–1998	262,595	127,047	27,418	45,741	73,159	62,389
1998–1999 ^P	255,839	143,247	19,476	48,969	68,445	44,147
1999–2000 ^C	246,827	137,134	18,502	49,579	68,081	41,612
2000–2001 ^C	253,809	140,903	19,688	51,098	70,786	42,120
Nova Scotia						
1997–1998	1,708,685	920,575	73,749	465,129	538,878	249,232
1998–1999 ^P	1,840,908	1,026,563	78,201	521,963	600,164	214,181
1999–2000 ^C	1,871,434	1,016,415	81,316	554,475	635,791	219,228
2000–2001 ^C	1,855,404	997,429	81,395	563,341	644,736	213,239
New Brunswick						
1997–1998	1,495,653	847,354	66,852	322,776	389,628	258,671
1998–1999 ^P	1,474,210	862,130	64,515	334,211	398,726	213,354
1999–2000 ^C	1,550,374	885,708	64,360	354,557	418,917	245,749
2000–2001 ^C	1,566,505	892,692	65,074	354,980	420,054	253,759
Quebec						
1997–1998	14,177,341	7,600,775	1,970,277	3,122,538	5,092,815	1,483,751
1998–1999 ^P	14,916,774	7,749,828	1,931,869	3,116,067	5,047,936	2,119,010
1999–2000 ^C	15,528,549	8,260,028	1,960,681	3,118,554	5,079,235	2,189,286
2000–2001 ^C	15,868,534	8,604,722	1,968,014	3,022,225	4,990,239	2,273,573
Ontario						
1997–1998	23,671,958	15,502,879	1,363,805	4,367,105	5,730,910	2,438,169
1998–1999 ^P	25,636,086	17,108,411	1,445,817	4,722,902	6,168,719	2,358,956
1999–2000 ^C	25,029,753	15,310,173	1,712,466	5,425,848	7,138,314	2,581,266
2000–2001 ^C	24,279,727	15,455,759	1,467,435	4,956,734	6,424,169	2,399,799
Manitoba						
1997–1998	2,416,083	1,616,574	90,974	450,277	541,251	258,258
1998–1999 ^P	2,549,316	1,690,663	92,399	496,009	588,408	270,245
1999–2000 ^C	2,644,808	1,750,788	97,079	523,260	620,339	273,681
2000–2001 ^C	2,742,671	1,810,655	108,748	544,340	653,088	278,928
Saskatchewan						
1997–1998	2,212,350	1,335,093	59,218	507,921	567,139	310,118
1998–1999 ^P	2,282,994	1,372,111	60,978	510,742	571,720	339,163
1999–2000 ^C	2,325,435	1,397,212	64,822	526,089	590,911	337,312
2000–2001 ^C	2,416,923	1,461,674	63,438	554,220	617,658	337,591
Alberta						
1997–1998	5,903,227	3,528,301	397,499	1,064,928	1,462,427	912,499
1998–1999 ^P	6,423,402	3,871,761	462,531	1,171,435	1,633,966	917,675
1999–2000 ^C	6,714,155	3,922,376	430,772	1,160,280	1,591,052	1,200,727
2000–2001 ^C	6,876,906	4,083,845	458,859	1,199,017	1,657,876	1,135,185

See notes at end of table.



Table 4
Expenditures on education, by level, 1997–1998 to 2000–2001 (concluded)

	Total	Elementary– secondary ¹	Postsecondary ²			Trade level ³
			Community college	University	Subtotal	
\$ thousands						
British Columbia						
1997–1998	8,209,085	4,802,043	550,665	1,555,265	2,105,930	1,301,112
1998–1999 ^P	8,324,220	4,898,530	531,997	1,543,268	2,075,265	1,350,425
1999–2000 ^c	8,350,141	4,978,414	554,416	1,591,486	2,145,902	1,225,825
2000–2001 ^e	8,638,243	5,157,473	571,491	1,650,153	2,221,644	1,259,126
Yukon						
1997–1998	111,808	82,838	7,383	3,479	10,862	18,108
1998–1999 ^P	105,545	77,516	6,937	3,835	10,772	17,257
1999–2000 ^c	110,811	81,424	7,121	2,651	9,772	19,615
2000–2001 ^e	107,865	80,549	7,223	..	7,223	20,093
Northwest Territories						
1997–1998	300,339	211,662	42,671	3,953	46,624	42,053
1998–1999 ^P	301,894	207,361	44,372	4,344	48,716	45,817
1999–2000 ^c	191,876	99,823	45,021	1,343	46,364	45,689
2000–2001 ^e	205,645	110,974	48,359	..	48,359	46,312
Nunavut						
1997–1998	..	..	..	–	..	..
1998–1999 ^P	..	..	..	–	..	..
1999–2000 ^c	125,685	92,702	13,431	–	13,431	19,552
2000–2001 ^e	129,072	96,255	12,911	–	12,911	19,906
Other⁴						
1997–1998	243,885	23,701	2,476	72,133	74,609	145,575
1998–1999 ^P	218,228	47,468	2,878	85,367	88,245	82,515
1999–2000 ^c	238,763	57,795	4,192	87,647	91,839	89,129
2000–2001 ^e	146,971	57,810	–	–	–	89,161

Notes:


.. Figures not available.

– Nil or zero.

- Includes public and private schools. Public includes: (i) federal schools and schools for the visually and hearing impaired; (ii) provincial and federal department spending on elementary-secondary education; (iii) academic education in federal penitentiaries and provincial reform schools; and (iv) departmental administration.
- Expenditures on postsecondary education include: (i) operating and capital expenditures of universities, community colleges and similar institutions, and postsecondary programs in nursing schools; (ii) student aid, scholarships and bursaries; and (iii) direct expenditures by federal and provincial governments.
- Expenditures on vocational training include: (i) training sponsored by Human Resources Development Canada; (ii) federal expenditures on language courses; (iii) vocational training in federal penitentiaries and provincial reformatory schools; (iv) various training courses set by federal and provincial authorities; and (v) private trade schools, art schools, music schools, etc.
- Includes Canada's spending on education in foreign countries and undistributed expenditures.

Education at a glance

This section provides a series of social, economic and education indicators for Canada and the provinces/territories. Included are key statistics on the characteristics of the student and staff populations, educational attainment, public expenditures on education, labour force employed in education, and educational outcomes.

 Table 1 Education indicators, Canada, 1981 to 1999											
Indicator ¹	1981	1986	1991	1992	1993	1994	1995	1996	1997	1998	1999
	thousands										
Social context											
Population aged 0–3	1,448.7	1,475.0	1,573.4	1,601.7	1,610.6	1,596.1	1,595.1	1,578.6	1,560.7	1,550.7	1,453.9
Population aged 4–17	5,480.3	5,204.7	5,395.4	5,437.7	5,484.7	5,536.4	5,620.7	5,691.4	5,754.0	5,795.7	5,725.6
Population aged 18–24	3,493.1	3,286.3	2,886.1	2,869.2	2,869.6	2,852.0	2,823.4	2,816.8	2,833.0	2,865.4	2,895.9
Total population	24,900.0	26,203.8	28,120.1	28,542.2	28,940.6	29,248.1	29,562.5	29,963.7	30,358.5	30,747.0	30,553.8
Youth immigration ^f	42.8	25.9	61.2	61.2	73.1	68.3	65.9	66.3	70.4	61.2	..
	%										
Lone-parent families	16.6	18.8	15.3	14.4	14.8	14.9	15.1	14.8	14.9	..	..
Economic context											
GDP: Real annual percentage change	4.0	3.1	-1.8	-0.6	2.2	4.1	2.3	1.5	..	..	..
CPI: Annual percentage change	12.4	4.2	5.6	1.5	1.8	0.2	2.2	1.7	1.7	1.0	1.9
Employment rate	60.0	59.6	59.7	58.4	58.0	58.4	58.8	58.5	59.0	59.7	60.6
Unemployment rate	7.6	9.7	10.3	11.2	11.4	10.4	9.4	9.7	9.1	8.3	7.6
Student employment rate	..	34.4	38.0	35.1	34.0	34.2	33.3	34.8	32.5 ²	..	..
Families below low income cut-offs:											
Two-parent families	10.2	10.9	10.8	10.6	12.2	11.5	12.8	11.8	12.0	..	..
Lone-parent families	48.4	52.5	55.4	52.3	55.0	53.0	53.0	56.8	51.1	..	..
Enrolments											
	thousands										
Elementary/secondary schools	5,024.2	4,938.0	5,218.2	5,284.1	5,327.8	5,362.8	5,441.4	5,414.6	5,386.3	5,483.9 ^e	5,524.9 ^e
	%										
Percentage in private schools	4.3	4.6	4.7	4.9	5.0	5.1	5.1	5.2	5.3	5.3 ^e	..
	thousands										
College/trade/vocational, full-time ³	..	238.1	275.9	266.7	306.5	298.5	269.1	266.4 ^e	264.5 ^e	..	..
College/postsecondary, full-time	273.4	321.5	349.1	364.6	369.2 ^r	380.0 ^r	391.3 ^r	397.3 ^r	398.6	403.5 ^r	409.4 ^e
College/postsecondary, part-time ⁴	..	96.4 ^e	125.7 ^e	106.6 ^e	98.4	90.8	87.7	87.1	91.6	91.4	..

See notes at end of this table.


Table 1
Education indicators, Canada, 1981 to 1999 (concluded)

Indicator ¹	1981	1986	1991	1992	1993	1994	1995	1996	1997	1998	1999
	thousands										
Full-time university	401.9	475.4	554.0	569.5	574.3	575.7	573.2	573.6	573.1 ^r	580.4	..
Part-time university	251.9	287.5	313.3	316.2	300.3	283.3	273.2	256.1	249.7	246.0	..
Adult education and training	..	..	5,504	..	5,842	..	..	..	6,069	..	..
	%										
Participation rate	..	..	27	..	28	..	..	..	26	..	..
Graduates	thousands										
Secondary schools ⁵	..	..	260.7	272.9	281.4	280.4	295.3	300.2 ^r	296.4 ^r	300.8 ^e	..
College/trade/vocational ⁶	..	145.0	159.7	158.8	163.9	151.1	144.2	141.5 ^e	138.7 ^e	..	..
College/postsecondary	71.8	82.4	85.9	92.5	95.2	97.2	100.9	105.0	105.9 ^e	..	..
University/Bachelor's	84.9	101.7	114.8	120.7	123.2	126.5	127.3	128.0	125.8	124.9	..
University/Master's	12.9	15.9	18.0	19.4	20.8	21.3	21.4	21.6	21.3	22.0	..
University/Doctorate	1.8	2.2	2.9	3.1	3.4 ^e	3.6	3.7	3.9	4.0	4.0	..
Full-time educators	ratio										
Elementary/secondary schools	274.6	269.9	302.6	301.8	295.4	295.7 ^e	298.7 ^e	294.4 ^e	296.8 ^e	295.9 ^e	295.9 ^e
College/postsecondary/trade/vocational	26.8 ⁷	30.6 ⁷	31.7 ⁷	31.8 ⁷	32.2 ⁷	31.0 ⁷	30.9 ^r	31.5 ^r	31.0 ^r	32.1 ^e	..
University	33.6	35.4	36.8	37.3	36.9	36.4	36.0	34.6	33.7	33.7 ^e	..
Elementary/secondary pupil-educator ratio	17.0	16.5	15.5	15.7 ^e	16.1 ^e	16.1 ^e	16.1 ^e	16.3 ^e	16.3 ^e	16.5 ^e	16.6 ^e
Education expenditures	\$ millions										
Elementary/secondary	16,703.2	22,968.0	33,444.9	34,774.5	35,582.3	35,936.0	36,424.7	36,744.7	36,973.1 ^P	37,453.8 ^e	37,498.9 ^e
Vocational	1,601.2	3,275.1	4,573.8	5,380.9	5,631.2	6,559.0	6,185.2	5,301.8	5,896.9 ^P	5,903.4 ^e	6,229.6 ^e
College	2,088.1	2,999.0	3,870.7	4,075.3	4,105.9	4,207.1	4,531.8	4,477.9	4,642.0 ^P	4,808.9 ^e	5,261.7 ^e
University	4,980.7	7,368.7	11,254.8	11,569.8	11,736.8	11,857.9	11,802.0	11,600.7	12,255.4 ^P	12,660.5	12,874.9 ^e
Total education expenditures	25,373.2	36,610.8	53,144.2	55,800.5	57,056.2	58,560.0	58,943.7	58,125.1	59,767.4 ^P	60,826.6	61,865.1
	%										
As a percentage of GDP	7.1	7.3	7.9	8.1	8.0	7.8	7.6	7.1	6.9	6.8	..

Notes:

1. See 'Definitions' following Table 2.

2. The figure is for April 1997.

3. The enrolments have all been reported as full-time based on a 'full-day' program, even though the duration of the programs varies from 1 to 48 weeks.

4. Excludes enrolments in continuing education courses, which had previously been included.

5. Source: Canadian Education Statistics Council. (Excludes adults for Quebec, Ontario and Alberta equivalencies.)

6. The majority of trade and vocational programs, unlike graduate diploma programs which are generally two or three years' duration, are short programs or single courses that may require only several weeks. A person successfully completing these short-duration programs or courses is considered a completer, not a graduate. These completers do not include persons in part-time programs.

7. Figures have been revised to include a complete count of staff in trade programs.



Table 2
Education indicators, provinces and territories

Indicator ¹	Canada	Newfound- land	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario
	%						
Social and economic context							
Educational attainment, ² 1999:							
Less than secondary diploma	26.8	38.4	35.7	30.8	32.9	33.0	24.1
Graduated from high school	19.3	14.1	15.1	14.0	19.9	15.8	21.0
Some postsecondary	6.9	4.8	5.5	5.6	4.5	5.4	7.2
Postsecondary certificate, diploma or university degree	47.0	42.6	43.8	49.5	42.8	45.7	47.6
Labour force participation rates by educational attainment, 1999:							
Total	66.0	58.5	65.7	60.8	60.8	63.4	66.9
Less than secondary diploma	40.0	34.5	47.0	36.2	36.2	37.5	40.2
Graduated from high school	69.6	64.4	73.7	66.8	69.1	70.1	68.8
Some postsecondary	71.8	63.0	71.4	70.0	67.9	70.3	72.1
Postsecondary certificate, diploma or university degree	78.5	77.8	77.0	73.4	75.1	79.0	78.9
Unemployment rate, 1999	6.3	15.1	13.4	7.8	8.9	8.1	5.0
Costs							
Public and private expenditures on education as a percentage of GDP, 1994–1995	7.0	9.9	7.6	7.6	7.4	7.6	6.8
Public expenditures on education as a percentage of total public expenditures, 1994–1995	13.6	16.9	10.8	9.7	11.2	13.8	14.2
Elementary/secondary pupil–educator ratio, 1997–1998	16.4 ^r	14.6	17.2	17.5	17.6	14.6 ^r	16.7 ^r
Educational outcomes							
Secondary school graduation rates, 1996–1997	73.4	80.2	85.6	80.7	86.0	75.9 ^{3,4}	72.0
University graduation rate, 1997–1998	35.2 ^r	31.4 ^r	21.0 ^r	53.5 ^r	32.9 ^r	41.8 ^r	36.7
Unemployment rate by level of educational attainment, 1999							
Less than secondary diploma	10.4	25.4	23.6	13.0	15.7	12.7	7.7
Graduated from high school	6.3	16.7	15.3	6.6	8.9	8.4	5.1
Some postsecondary	7.1	9.2	5.7	5.8	5.9	9.8	6.6
Postsecondary certificate, diploma or university degree	5.0	10.7	8.1	6.6	6.5	6.2	4.1

See notes at end of this table.



Table 2
Education indicators, provinces and territories (concluded)

Indicator ¹	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon	Northwest Territories
	%					
Social and economic context						
Educational attainment, ² 1999:						
Less than secondary diploma	30.9	31.4	21.6	20.5	..	..
Graduated from high school	18.3	18.8	19.9	22.6	..	..
Some postsecondary	6.8	7.9	8.2	8.8	..	..
Postsecondary certificate, diploma or university degree	44.0	41.9	50.3	48.1	..	..
Labour force participation rates by educational attainment, 1999:						
Total	66.8	67.5	73.1	65.8	..	..
Less than secondary diploma	44.5	44.6	50.4	39.8	..	..
Graduated from high school	72.1	77.5	75.4	66.5	..	..
Some postsecondary	75.9	73.5	77.5	69.0	..	..
Postsecondary certificate, diploma or university degree	78.9	79.1	81.2	76.0	..	..
Unemployment rate, 1999	4.6	4.8	4.4	7.2	..	..
Costs						
Public and private expenditures on education as a percentage of GDP, 1994–1995	7.8	7.4	5.4	6.5	11.3	16.6
Public expenditures on education as a percentage of total public expenditures, 1994–1995	12.9	13.8	13.2	12.2	10.4	12.0
Elementary/secondary pupil–educator ratio, 1997–1998	16.3	17.3	17.8 ^r	17.5	13.2	13.1
Educational outcomes						
Secondary school graduation rates, 1996–1997	78.1	78.8	64.7	70.5	37.3	24.6
University graduation rate, 1997–1998	31.3 ^r	34.1 ^r	26.8 ^r	24.5 ^r	..	..
Unemployment rate by level of educational attainment, 1999						
Less than secondary diploma	6.8	7.9	5.6	12.8	..	..
Graduated from high school	4.2	3.9	3.9	8.1	..	..
Some postsecondary	4.7	5.6	5.2	7.3	..	..
Postsecondary certificate, diploma or university degree	3.8	3.7	3.9	5.6	..	..

Notes:

1. See 'Definitions' following Table 2.

2. Parts may not add up to 100% due to rounding.

3. Starting in 1995, Quebec graduate data for regular day programs include individuals over the age of 20 that graduated from regular day programs.

4. Excludes "Formation professionnelle."

..

Definitions

Education indicators, Canada

Table 1.

Year references are as follows: (1) *population* refers to July of the given year; (2) *enrolment* and *staff* refer to the academic year beginning in September of the given year; (3) *graduates* refers to number of persons graduating in the spring or summer of the given year; (4) *expenditures* refers to the fiscal year beginning in April of the given year.

- 1. Youth immigration**
The number of persons aged 0 to 19 who are, or have been, landed immigrants in Canada. A landed immigrant is a person who is not a Canadian citizen by birth, but who has been granted the right to live in Canada permanently by Canadian immigration authorities.
- 2. Lone-parent families**
The number of lone-parent families expressed as a percentage of the total number of families with children. A lone parent refers to a mother or a father, with no spouse or common-law partner present, living in a dwelling with one or more never-married sons and/or daughters. Sources: Statistics Canada, 1971 to 1986: *Lone-parent families in Canada*, Catalogue no. 89-522-XPE; 1991 to present: Small Area and Administrative Data Division.
- 3. Gross domestic product**
The unduplicated value of production originating within the boundaries of Canada, regardless of the ownership of the factors of production. GDP can be calculated three ways: as total incomes earned in current production; as total final sales of current production; or as total net values added in current production. It can be valued either at factor cost or at market prices. Source: Statistics Canada, Industry, Measures and Analysis Division.
- 4. Consumer Price Index**
The Consumer Price Index (CPI) is an indicator of changes in consumer prices. It is defined as a measure of price change obtained by comparing, over time, the cost of a specific basket of commodities. Figures are annual averages.
- 5. Employment rate**
The number of persons employed expressed as a percentage of the population 15 years of age and over, excluding institutional residents. Figures are annual averages.
- 6. Unemployment rate**
The number of unemployed persons expressed as a percentage of the labour force.
- 7. Student employment rate**
The number of persons aged 15 to 24 attending school on a full-time basis who were employed during the calendar year (excluding May through August), expressed as a percentage of the total number of full-time students 15 to 24 years of age.
- 8. Families below low income cut-offs**
Low income cut-offs are a relative measure of the income adequacy of families. A family that earns less than one-half of the median adjusted family unit income is considered to be in difficult circumstances. The set of low income cut-offs is adjusted for the size of the area of residence and for family size. Source: Statistics Canada, *Low Income Persons, 1980 to 1995*, December 1996, Catalogue no. 13-569-XPB/XIB.
- 9. Adult education participation rate**
The number of persons 17 years of age or over participating in adult education or training activities, expressed as a percentage of the total population 17 years of age or over. Excludes regular full-time students who are completing their initial schooling.
- 10. Elementary/secondary pupil-educator ratio**
Full-time equivalent enrolment (enrolment in grades 1 to 12 [including Ontario Academic Credits] and ungraded programs, pre-elementary enrolment in provinces where attendance is full time, and half of the pre-elementary enrolment in other provinces) divided by the full-time equivalent number of educators.
- 11. Education expenditures**
Includes expenditures of governments and of all institutions providing elementary/secondary and postsecondary education, and vocational training programs offered by public and private trade/vocational schools and community colleges.

Education indicators, provinces and territories

Table 2.

The methodologies used to derive the indicators in Table 2 may differ from those used in other statistical tables of this section.

12. Educational attainment and labour force participation rates

Refers to the population aged 25 and over. Source: Statistics Canada, Labour Statistics Division.

13. Secondary school graduation rate

Source: Statistics Canada, 1999, Centre for Education Statistics, *Education in Canada*, Catalogue no. 81-229-XPB.

14. University graduation rate

Number of degrees awarded at the undergraduate level, as a percentage of the population aged 22.

15. Unemployment rate by level of educational attainment

The number unemployed with a given level of education expressed as a percentage of the labour force with the same education for the population aged 25 and over. Upper secondary includes the final grade of secondary school.

EQR



In upcoming
ISSUES

The following articles are scheduled to appear in upcoming issues of *Education Quarterly Review*:

Income prospects of British Columbia university graduates

Using tax and administrative records of B.C. bachelor's graduates, income of graduates is examined with a focus on changes in income over time, as well as differences across major fields of study.

Labour market performance of liberal arts and sciences university graduates

The labour market experiences of liberal arts and sciences university graduates are examined using data from the Survey of Labour and Income Dynamics. The paper examines dynamic issues including occupational mobility and wage growth. Evidence is offered to suggest that the skills of the liberal arts and sciences group are more portable across industrial and occupational sectors.

Transition and mobility of university graduates

An examination of employed university graduates two years after having obtained their degree. Socio-demographic differences exist in the proportion of graduates who seek employment. In particular, single graduates, those without children and those in the doctoral program seek other employment to a greater extent than other graduates.

Family income and participation in postsecondary education

This analysis looks at family income and its impact on participation in postsecondary education, and suggests that parents' education has a stronger effect than income on the likelihood of children going on to post-high school education. In addition to the involvement of parents in their children's education, other important factors include aspirations, values and motivations that facilitate educational attainment.

Factors affecting Grade 3 performance in Ontario

Using data from Ontario's Education Quality and Accountability Office (EQAO), this study examines factors influencing academic performance of grade three students in Ontario. EQAO also provides information about students, their classrooms, their schools and their families. The analysis reveals a large variation in academic achievement associated with classes and schools and indicates that much of the variation in achievement is explained by individual level characteristics. EQR

This index lists all analytical articles published in *Education Quarterly Review*. Included are descriptions of education and education-related surveys conducted by Statistics Canada, provincial governments and institutions. The categories under which the articles appear are based on policy issues identified in the report *Strategic Plan (1997)*, released by the Centre for Education Statistics in November 1997 and available on the Internet at address www.statcan.ca/cgi-bin/downpub/freepub.cgi

Education funding

Education Price Index: Selected inputs, elementary and secondary level

Vol. 1, No. 3 (October 1994)

Does Canada invest enough in education? An insight into the cost structure of education in Canada

Vol. 1, No. 4 (December 1994)

School transportation costs

Vol. 2, No. 4 (January 1996)

Federal participation in Canadian education

Vol. 3, No. 1 (May 1996)

Funding public school systems: A 25-year review

Vol. 4, No. 2 (September 1997)

Student flows, student mobility and transitions

Education indicators, interprovincial and international comparisons

Vol. 1, No. 2 (July 1994)

The search for education indicators

Vol. 1, No. 4 (December 1994)

Intergenerational change in the education of Canadians

Vol. 2, No. 2 (June 1995)

Participation in pre-elementary and elementary and secondary education in Canada: A look at the indicators

Vol. 2, No. 3 (September 1995)

Educational outcome measures of knowledge, skills and values

Vol. 3, No. 1 (May 1996)

Interprovincial university student flow patterns

Vol. 3, No. 3 (October 1996)

After high school ... Initial results of the School Leavers Follow-up Survey, 1995

Vol. 3, No. 4 (January 1997)

Varied pathways: The undergraduate experience in Ontario

Vol. 4, No. 3 (February 1998)

Education: The treasure within

Vol. 6, No. 1 (October 1999)

Brain drain and brain gain: The migration of knowledge workers from and to Canada

Vol. 6, No. 3 (May 2000)

Pathways to the United States: Graduates from the class of '95

Vol. 6, No. 3 (May 2000)

Who are the disappearing youth? An analysis of non-respondents to the School Leavers Follow-up Survey, 1995

Vol. 6, No. 4 (August 2000)

100 years of education

Vol. 7, No. 3 (May 2001)

Relationships between education and the labour market

Returning to school full time

Vol. 1, No. 2 (July 1994)

Trends in education employment

Vol. 1, No. 3 (October 1994)

Male–female earnings gap among postsecondary graduates

Vol. 2, No. 1 (March 1995)

Survey of labour and income dynamics: An overview

Vol. 2, No. 2 (June 1995)

Earnings and labour force status of 1990 graduates

Vol. 2, No. 3 (September 1995)

Worker bees: Education and employment benefits of co-op programs

Vol. 2, No. 4 (January 1996)

Youth combining school and work

Vol. 2, No. 4 (January 1996)

Employment prospects for high school graduates

Vol. 3, No. 1 (May 1996)

Relationship between postsecondary graduates' education and employment

Vol. 3, No. 2 (July 1996)

Labour market dynamics in the teaching profession

Vol. 3, No. 4 (January 1997)

Educational attainment—a key to autonomy and authority in the workplace

Vol. 4, No. 1 (May 1997)

Youth employment: A lesson on its decline

Vol. 5, No. 3 (March 1999)

Determinants of university and community college leaving

Vol. 6, No. 4 (August 2000)

Overqualified? Recent graduates and the needs of their employers

Vol. 7, No. 1 (November 2000)

Holding their own: Employment and earnings of postsecondary graduates

Vol. 7, No. 1 (November 2000)

Graduates' earnings and the job skills–education match

Vol. 7, No. 2 (February 2001)

New hirings and permanent separations

Vol. 7, No. 2 (February 2001)

School-to-work transition: A focus on arts and culture graduates

Vol. 7, No. 3 (May 2001)

Technology and learning

Occupational training among unemployed persons

Vol. 1, No. 1 (April 1994)

An overview of trade/vocational and preparatory training in Canada

Vol. 1, No. 1 (April 1994)

Adult Education and Training Survey: An overview

Vol. 1, No. 3 (October 1994)

Women in registered apprenticeship training programs

Vol. 1, No. 4 (December 1994)

Adult education: A practical definition

Vol. 2, No. 1 (March 1995)

Survey of private training schools in Canada, 1992

Vol. 2, No. 3 (September 1995)

The education component of the National Longitudinal Survey of Children and Youth

Vol. 3, No. 2 (July 1996)

Computer literacy—a growing requirement

Vol. 3, No. 3 (October 1996)

International survey on adult literacy

Vol. 3, No. 4 (January 1997)

The National Longitudinal Survey of Children and Youth, 1994–95: Initial results from the school component

Vol. 4, No. 2 (September 1997)

Third International Mathematics and Science Study:
Canada report, Grade 8

Vol. 4, No. 3 (February 1998)

Science and technology careers in Canada: Analysis
of recent university graduates

Vol. 4, No. 3 (February 1998)

Intergenerational education mobility: An international
comparison

Vol. 5, No. 2 (December 1998)

A profile of NLSCY schools

Vol. 5, No. 4 (July 1999)

Parents and schools: The involvement, participation,
and expectations of parents in the education of their
children

Vol. 5, No. 4 (July 1999)

Academic achievement in early adolescence: Do
school attitudes make a difference?

Vol. 6, No. 1 (October 1999)

How do families affect children's success in school?

Vol. 6, No. 1 (October 1999)

Neighbourhood affluence and school readiness

Vol. 6, No. 1 (October 1999)

Diversity in the classroom: Characteristics of
elementary students receiving special education

Vol. 6, No. 2 (March 2000)

Children's school experiences in the NLSCY

Vol. 6, No. 2 (March 2000)

Parental involvement and children's academic
achievement in the National Longitudinal Survey
of Children and Youth, 1994–95

Vol. 6, No. 2 (March 2000)

From home to school: How Canadian children cope

Vol. 6, No. 2 (March 2000)

Accessibility

The increase in tuition fees: How to make ends meet?

Vol. 1, No. 1 (April 1994)

University enrolment and tuition fees

Vol. 1, No. 4 (December 1994)

Financial assistance to postsecondary students

Vol. 2, No. 1 (March 1995)

Student borrowing for postsecondary education

Vol. 3, No. 2 (July 1996)

Job-related education and training—who has access?

Vol. 4, No. 1 (May 1997)

Financing universities: Why are students paying
more?

Vol. 4, No. 2 (September 1997)

Student debt from 1990–91 to 1995–96: An analysis
of Canada Student Loans data

Vol. 5, No. 4 (July 1999)

Women in engineering: The missing link in the
Canadian knowledge economy

Vol. 7, No. 3 (May 2001)

Alternative forms of education delivery

Private elementary and secondary schools

Vol. 1, No. 1 (April 1994)

Distance learning—an idea whose time has come

Vol. 2, No. 3 (September 1995)

Proprietary schools in Canada

Vol. 3, No. 1 (May 1996)

A profile of home schooling in Canada

Vol. 4, No. 4 (May 1998)

Distance education: Reducing barriers

Vol. 5, No. 1 (August 1998)

Teacher issues

Part-time university teachers: A growing group

Vol. 1, No. 3 (October 1994)

Teacher workload in elementary and secondary schools

Vol. 1, No. 3 (October 1994)

College and Related Institutions Educational Staff
Survey

Vol. 2, No. 1 (March 1995)

Employment income of elementary and secondary
teachers and other selected occupations

Vol. 2, No. 2 (June 1995)

Renewal, costs and university faculty demographics

Vol. 2, No. 3 (September 1995)

Teacher workload and work life in Saskatchewan

Vol. 2, No. 4 (January 1996)

Are we headed toward a teacher surplus or a teacher
shortage?

Vol. 4, No. 1 (May 1997)

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