performance indicators

a report on where we are and where we are going

Ontario Postsecondary Education System Performance

Higher Education Quality Council of Ontario (HEQCO)

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The Big Picture

In three of the four postsecondary performance domains examined for HEQCO's first annual performance indicator report, Ontario fares reasonably well. Comparatively, the system is efficient and productive. Its considerable investments in creating an accessible system places Ontario at the forefront of Canada and among world leaders in enrolment and attainment. Educated Ontarians (and their fellow Canadians) are more likely to be civically engaged and satisfied with their lives than citizens of other OECD nations. It's largely a good news story, but one that demands a new headline: It's time to focus on quality. And therein lies the caveat for this report and the challenge ahead for higher education systems in search of definitive quality measures.

Measuring performance in postsecondary education is a confounding endeavour. While opinions and anecdotes abound, strong and relevant measures elude, especially in the domain of quality.

Attempts to define and measure system quality have an honourable lineage. Early efforts focussed on inputs like funding per student (the more the better) and student-faculty ratios (the lower the better). But critics correctly noted that these really only measure the efficiency of the system, and not whether any results or outcomes have been achieved.

Then data were captured on outcomes such as graduation rates and graduate employment, still begging the question of whether these proved that graduates or their employers were well served by the educational journey to the job.

The next generation of inquiry put the emphasis on customer satisfaction – student engagement – as the proxy for quality. But is satisfaction a measure of quality? Are engaged students necessarily well prepared, labour-market-ready graduates?

While none of these measures has fully satisfied, they work together to inform the assessment of quality, albeit in an incomplete manner. Investments in measuring engagement (such as NSSE and student satisfaction surveys) and key performance indicators pay long-term dividends in understanding the system, tracking trends and helping inform management decisions at the institutional level and policy direction at the provincial level.

There is a new generation of quality measures emerging in the form of learning outcomes and informed perspectives on employer needs. With new and improved data, we will know more tomorrow than we do today about quality in Ontario's postsecondary system. With these limitations firmly in mind, HEQCO presents a report that speaks equally to what we can measure successfully and what we cannot. And it proposes a way forward to enhance the understanding and measurement of performance in Ontario's postsecondary system.

As the title of its recently published report, Quality: Shifting the Focus, suggests, HEQCO's expert panel on college and university strategic mandate agreement submissions identifies quality as the next frontier in higher education. To support the shift, the performance indicator report emphasises the need to better understand and measure quality.

Ontario's quality challenge must be met in a constrained economic environment. Choices will have to be made. A policy and funding framework that privileges growth needs to be retooled to emphasize quality outcomes. A measurement framework that has largely failed to assess quality in a convincing manner needs to evolve rapidly to do so.

This report reinforces the importance of better alignment between postsecondary skills and labour market needs, as well as a greater focus on defining and measuring learning outcomes – likely the next generation of core quality indicators. Currently, their absence is notable among the many data gaps identified in this first Ontario performance indicator exercise, perhaps second only to the stark absence of national comparators for Ontario's college sector. Largely absent as well, particularly for the university sector, is the voice of employers, although the college sector's Key Performance Indicators is a step in the right direction. Increased employer assessment of and satisfaction with the knowledge and skill sets of postsecondary graduates would be an invaluable resource for students, parents, educators and policy makers.

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Message from our president

Since its founding in 2005, the Higher Education Quality Council of Ontario (HEQCO) has been exploring the provincial postsecondary system's performance with the goal of generating a set of informative and useful indicators to assess that performance.

The project began with a HEQCO review of higher education performance measurement initiatives in other provinces and countries. In addition, a consultation document was sent to postsecondary institutions and other stakeholders. Advice was also sought from a group of individuals who are informed about issues relevant to postsecondary education and performance measurement, and are passionate about the purposes and importance of education. These individuals provided their time and expertise on a pro bono basis, and HEQCO thanks them for their support and advice.

It is our hope that this first annual benchmarking report will inform public debate, discussion and understanding of the Ontario postsecondary system, while providing relevant information to government and institutions that enables them to better manage and improve postsecondary education in Ontario.

Ideally, the most meaningful system performance measures cover the range of activities and contributions expected of postsecondary institutions. This report is based on four broad domains of performance indicators: access, quality, productivity and social impact. Not every performance measure is perfect, nor is every performance matrix, especially at its introduction. In fact, we find that measures of quality are far from perfect.

However, performance measurement is key to improvement and to advancing the Ontario postsecondary system, and this report is provided in that spirit and with these goals. It is presented with the expectation of continuous monitoring, assessment and refinement. We are confident that in this evolving process, additional and important data will make subsequent performance indicator reports even more meaningful and useful to the postsecondary sector. I welcome your comments on this report at indicators@heqco.ca.

Harvey P. Weingarten
President and CEO

Access: Ontario has reason to celebrate

Ontario has reason to celebrate its performance to date in terms of access to postsecondary education – both in enrolment and attainment of a postsecondary credential. Canada outpaces the OECD average in postsecondary attainment for both college and university, and Ontario is a Canadian leader in postsecondary participation. Although this enviable position also reflects the robust postsecondary attainment of immigrants (and almost half of new Canadian immigrants live in Ontario), funding of the province's postsecondary system has prioritized enrolment growth over the last several decades. This incentive, coupled with effective financial aid programs, has fueled the province's impressive performance in postsecondary enrolment and attainment.

Among the provinces, Ontario has one of the largest proportions of 25-64 year-olds with a college or university education. In fact, Ontario has experienced a 31% increase in university enrolment (headcounts) and a 20% increase in college enrolment (full-time equivalents) between 2002/03 and 2010/11 – not including international students.

Colleges have been particularly successful in supporting the enrolment of students from under-represented groups. HEQCO research shows that university students from under-represented groups are more likely to be college transfer students than direct-entry students, indicating that colleges also play an important role in access to university education for these students. Work remains, however, in increasing the participation and attainment of students from under-represented groups. HEQCO research has also shown that a different set of policy tools is required to improve their participation – particularly Aboriginal students and first-generation students (those whose parents have no postsecondary experience).

Compared to other provinces, Ontario's undergraduate university enrolment has been getting proportionally younger over the past decade, with a relatively high proportion of individuals aged 18-24, and a relatively low proportion of older students. Compared to the national average of 66% in 2010/11, three-quarters of Ontario university students are aged 18-24.

Finally, as previous HEQCO research underscores, access is inextricably linked to tuition, student financial aid and debt load. While we acknowledge their relevance, these contributors to access are not specifically examined in this report. We simply note that their aggregate influence and impact are reflected in the report's overall access indicators.

Access: The data

A National Snapshot on University Participation

Figure 1 shows university participation rates across the ten provinces in 2010/11, the most recent year for which data are available. Participation rates are broken down into three age groups: the "traditional" 18-24 year-old age group, and two older groups, those aged 25-30, and those 31 and older.

By "participation rate" we simply mean the number of Canadian students in each of the age groups who are enrolled in universities in each province, divided by the total population in each province who belong to that age group.

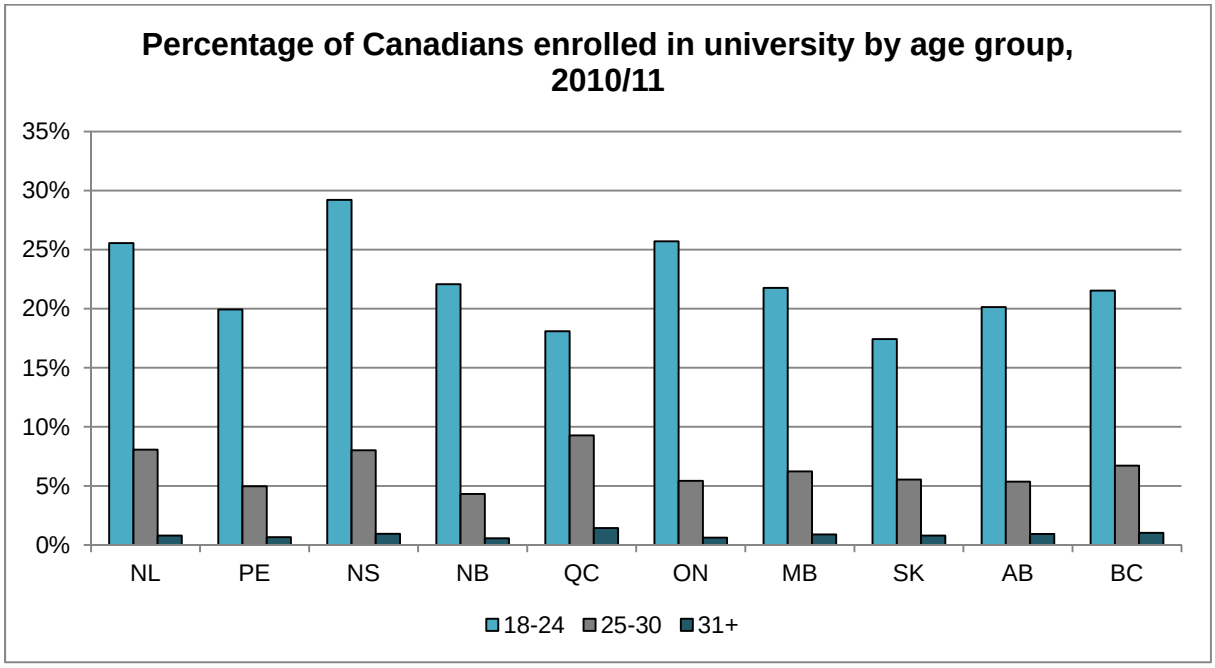
We are not attempting to include any individuals in each age group who have previously attended, but have now already graduated or simply left. They are, for the purposes of this measure, no longer participating. However, those who have left and graduated will be reflected in the adult attainment rate, presented below.

We note that this information has not been adjusted to try to account for individuals who are studying in a province other than their province of origin. So, for example, the percentage of 18-24 year-olds studying in Nova Scotia – the highest in the country – may be bolstered by a significant influx of students from other provinces to Nova Scotia's universities.

Not surprisingly, participation is by far the highest in the 18-24 year-old group. It drops off in the two older groups, with participation levels of around 1% across the country for people aged 31 years and older.

Despite many years of policy attention to "life-long learning," Ontario has a young student profile. Compared to other provinces, we have a relatively high proportion of individuals aged 18-24, and a relatively low proportion of older students, attending our universities.

Figure 1



Source: Statistics Canada Postsecondary Student Information System, and CANSIM Table 51-0001. Enrolment represents full-time and part-time headcounts, excluding international students.

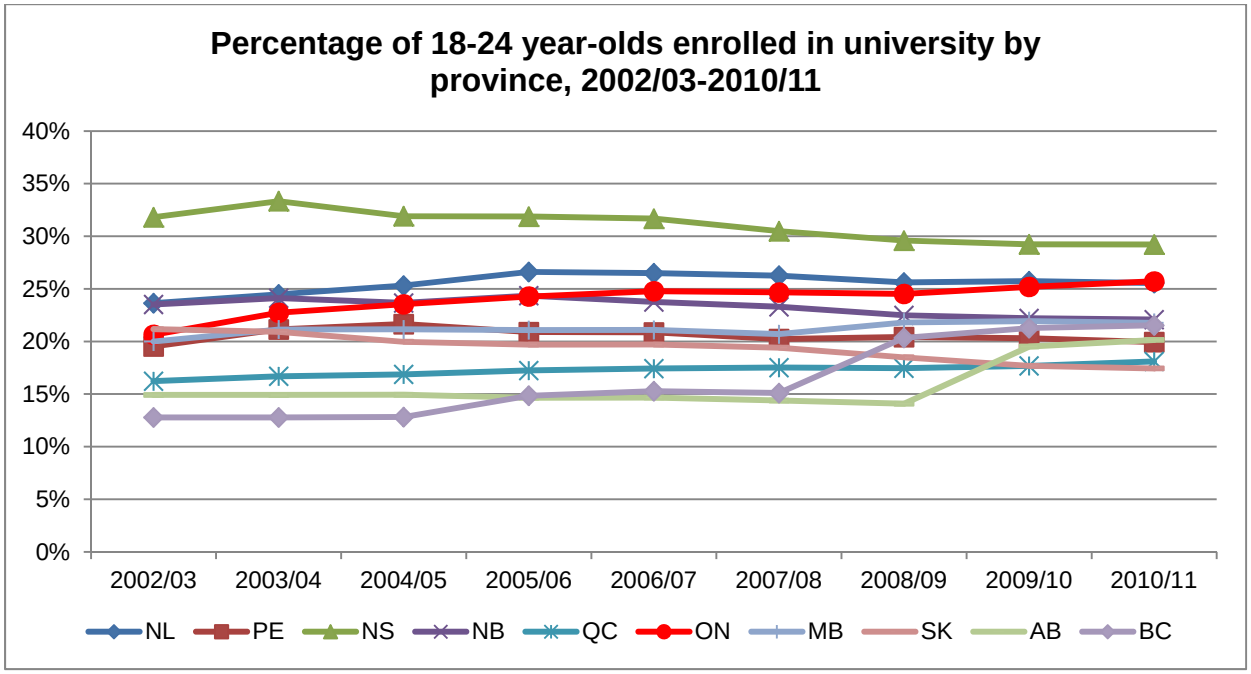
Recent Trends in University Participation

Whereas Figure 1 shows a picture of Canadian university participation in the most recent year available, 2010/11, Figures 2 through 4 show the change in participation rates over nine years, from 2002/03 through 2010/11.

Figure 2 shows the trend lines for all provinces for the 18-24 year-old group. Figures 3 and 4 do the same for the 25-30 year-old group and the 31 and older group, respectively. The information shown on these three figures for the final year, 2010/11, is identical to that summarized in Figure 1.

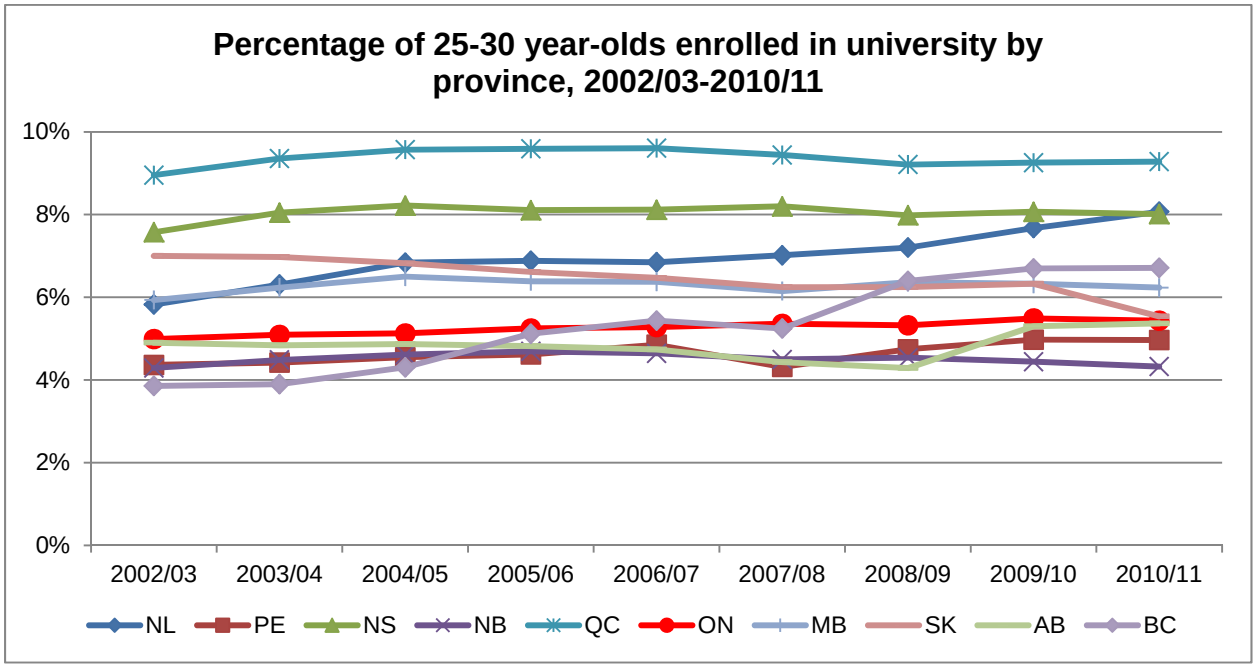
Overall, the pattern has been one of relative stability over the period measured. Relatively sudden increases in participation in British Columbia (2005/06 and 2008/09) and Alberta (2009/10) reflect the conversion of colleges to university status institutions in those provinces.

Figure 2



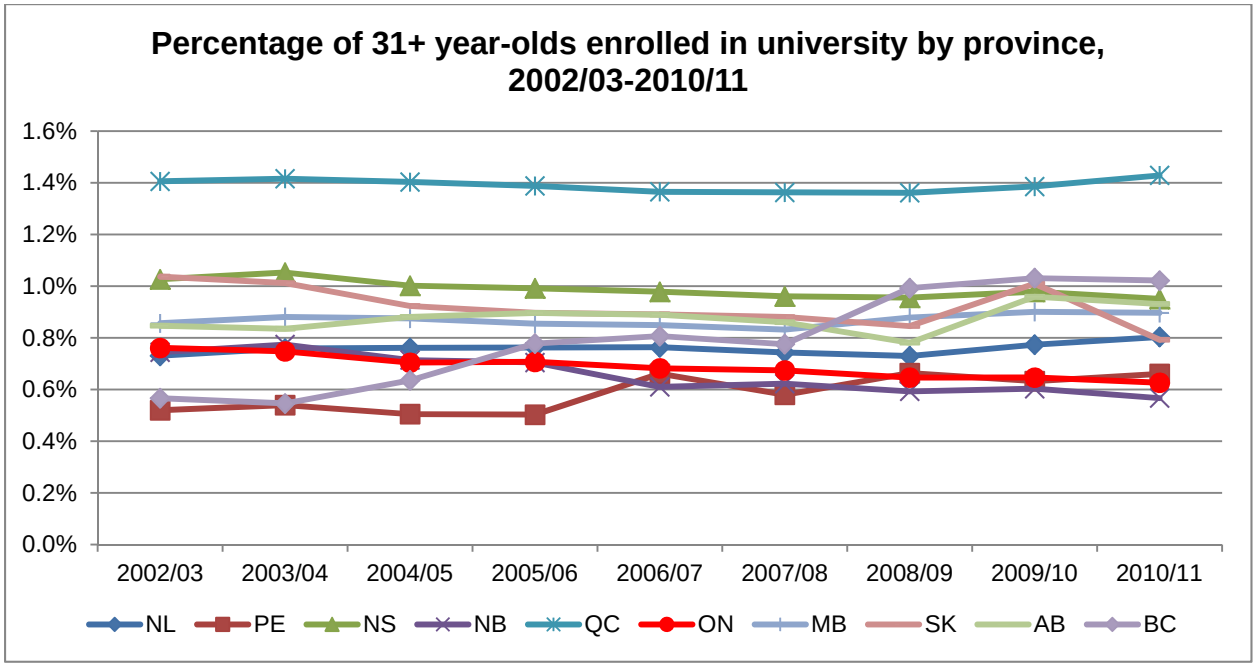
Source: Statistics Canada, Postsecondary Student Information System; CANSIM Table 51-0001.
Enrolment represents full-time and part-time headcounts, excluding international students.

Figure 3



Source: Statistics Canada, Postsecondary Student Information System; CANSIM Table 51-0001.
Enrolment represents full-time and part-time headcounts, excluding international students.

Figure 4



Source: Statistics Canada, Postsecondary Student Information System; CANSIM Table 51-0001.
Enrolment represents full-time and part-time headcounts, excluding international students.

Recent Trends in College Participation

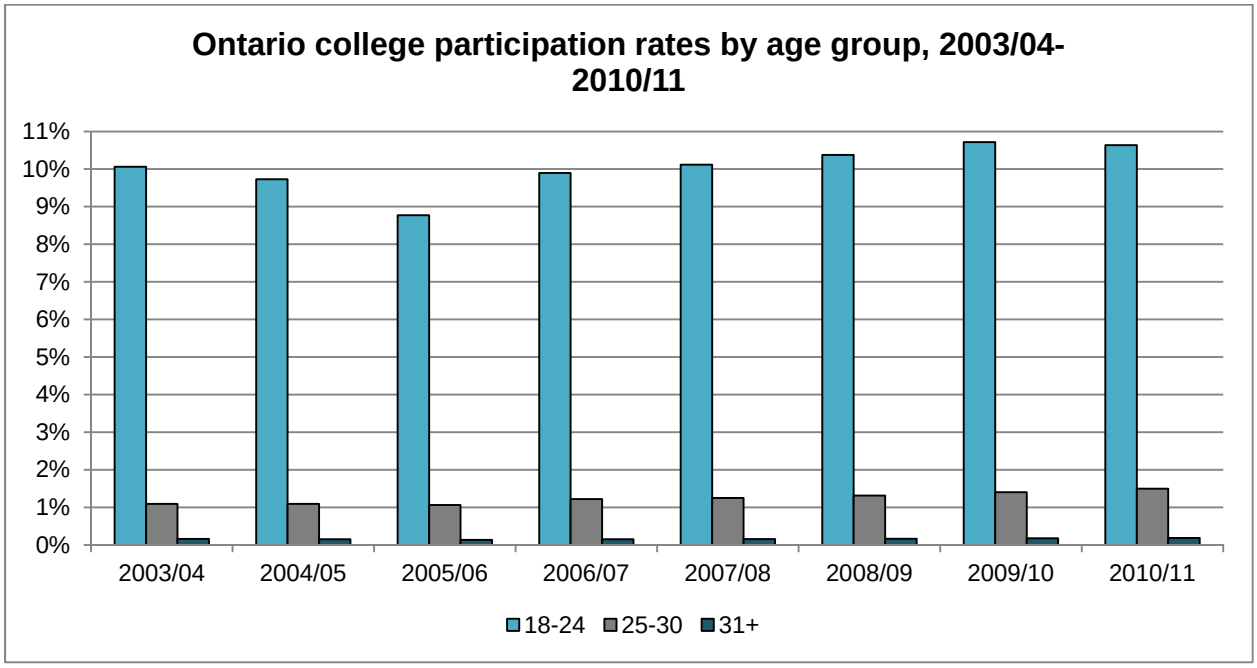
Unfortunately, pan-Canadian administrative enrolment data to drive interprovincial comparisons of college participation rates are unobtainable, due to persistent issues in the reporting of college enrolment data to Statistics Canada. We note that an alternative data source, the Labour Force Survey, is used for these purposes in other publications, and while it also provides valuable insights, we encourage the use of available administrative data to the greatest degree possible.

We can provide the participation rate trend for Ontario, and do so in Figure 5 for the years 2003/04 through 2010/11. Figure 5 is built from administrative data collected within the province, not from Statistics Canada data.

As with the university trend line shown in Figure 1, participation at Ontario colleges is heavily focussed on the 18-24 year-old cohort.

It should be noted that, on the whole, students spend less time obtaining a college education (one to three years) than a university education (three or more). The lower overall participation rates for colleges in relation to universities are largely a function of this difference.

Figure 5



Source: Colleges Ontario, Ontario College Application Service. Enrolment data are full-time students in funded programs.

Ontario University and College Participation Unpacked – who goes and who does not?

The figures above speak to overall levels of participation in universities and colleges, in three broad age groupings. It is also informative to look at available data on the kinds of students who attend colleges and universities, with regard to attributes such as family characteristics, gender, or membership in a traditionally under-represented group.

While overall participation in Ontario is high, the analysis which follows reminds us that there are identifiable segments of the population for which participation continues to be a challenge. The data also reveal significant differences in participation patterns for Ontarians attending college and those attending university.

Analysis of Statistics Canada's Youth in Transition Survey (YITS-A) data, which followed a cohort of individuals who were aged 15 in 1999 for ten years, reveals rates of participation associated with these important background characteristics. The "spider charts" that are Figures 6 and 7 summarize the findings for each of universities and colleges, respectively.

It should be noted that YITS-A is completely independent from the data sources used in Figures 1 through 5. Overall, self-reported participation rates in the YITS-A-generated spider charts are significantly higher than those shown in Figures 1 through 5. While a direct comparison of participation rates across all seven figures should therefore not be attempted, the spider charts are instructive in illuminating the patterns of participation underlying the overall provincial participation rate.

The grey circle in each of Figures 6 and 7 posts the overall (average) self-reported participation rates of respondents to YITS, for university and college students. The meandering teal line differentiates participation rates for respondents who also identified with each of the attributes listed outside the circumference of the circle.

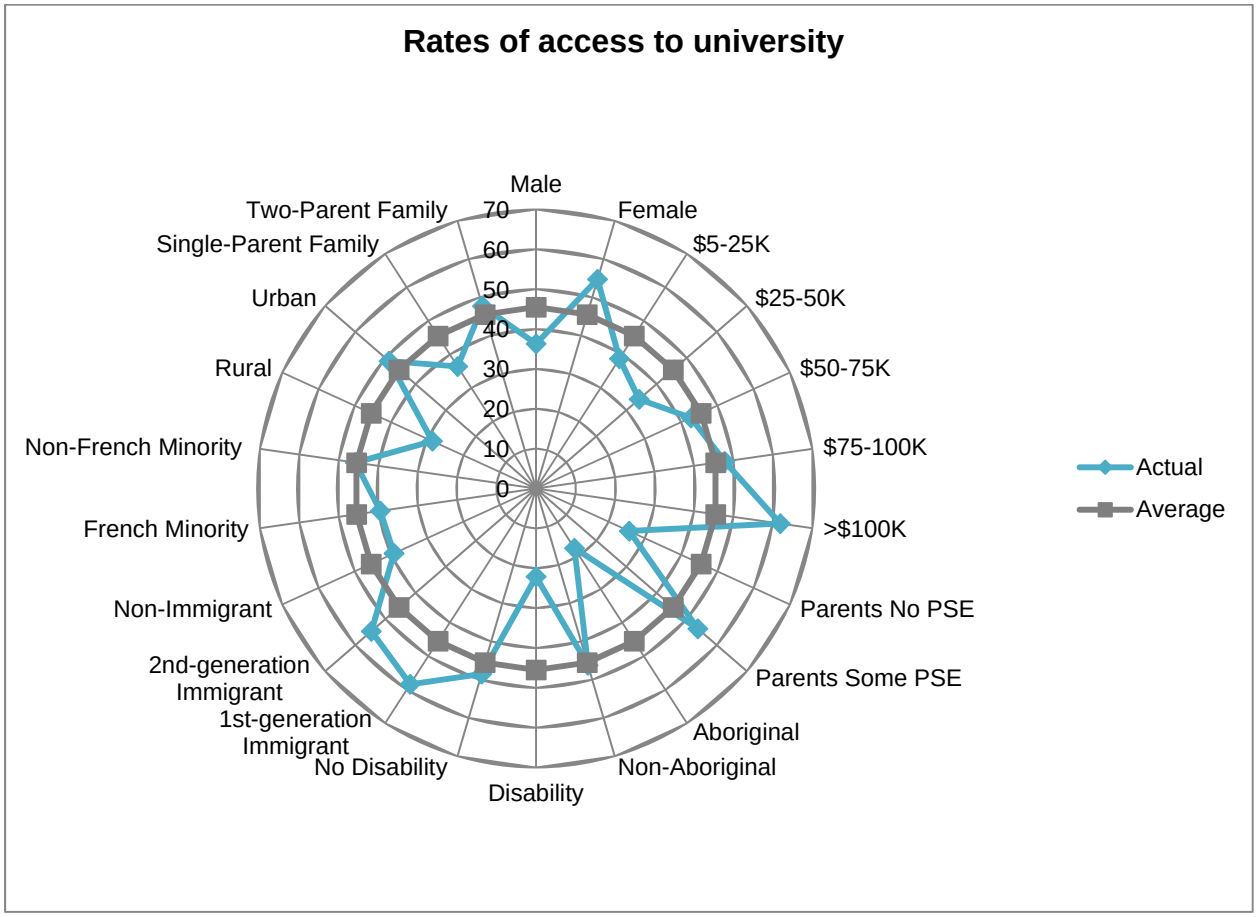
Wherever the teal line is inside the grey circle, this indicates a characteristic for which the participation rate lags below the provincial average. This is the case, for example, for university participation for those whose parents have no postsecondary education (see Figure 6). Wherever the teal line travels outside the grey circle, this indicates a characteristic for which the participation rate exceeds the provincial average. This is the case, for example, for college participation for those whose parents have no postsecondary education (see Figure 7).

Characteristics associated with rates of access to university below the provincial average include: being male, parental earnings below $75,000, parents with no postsecondary experience, Aboriginal students, students with a disability, non-immigrant students, French minorities, rural students, and students from single-parent families.

Characteristics associated with rates of access to college below the provincial average include: being female, parental earnings of $5,000-25,000 and over $100,000, students with parents who have some postsecondary education, immigrant students, and to a lesser degree, urban students.

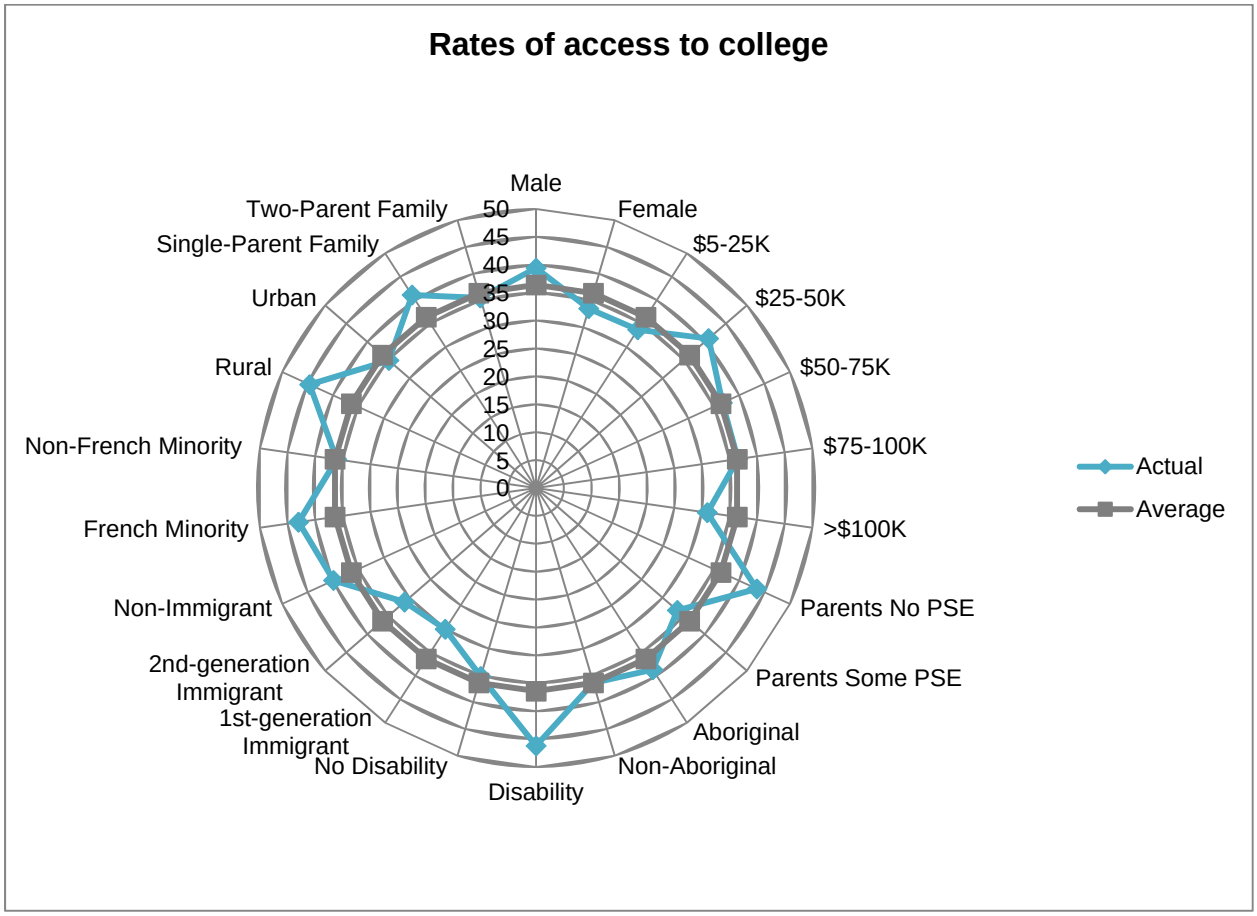
Table 1, immediately following the spider charts, provides a side-by-side summary of the different implications of these characteristics between college and university participation.

Figure 6



Sources: Statistics Canada's Youth in Transition Survey; Finnie, Childs, and Wismer's (2010) *Access to Postsecondary Education: How Ontario Compares* and *Under-Represented Groups in Postsecondary Education in Ontario: Evidence from the Youth in Transition Survey.*

Figure 7



Sources: Statistics Canada's Youth in Transition Survey; Finnie, Childs, and Wismer's (2010) *Access to Postsecondary Education: How Ontario Compares* and *Under-Represented Groups in Postsecondary Education in Ontario: Evidence from the Youth in Transition Survey.*

Table 1

Access comparisons between college and university participation

Characteristic	Participation in comparison to the average rate	
	University	College
Female	Higher	Lower
Family Income $5-25K	Lower	Lower
$25-50K	Lower	Higher
$50-75K	Lower	Average
$75-100K	Higher	Average
>$100K	Higher	Lower
Parents no PSE	Lower	Higher
Parents some PSE	Higher	Lower
Aboriginal	Lower	Higher
Disability	Lower	Higher
First-generation Immigrant	Higher	Lower
Second-generation Immigrant	Higher	Lower
French	Lower	Higher
Rural	Lower	Higher
Single-parent Family	Lower	Higher

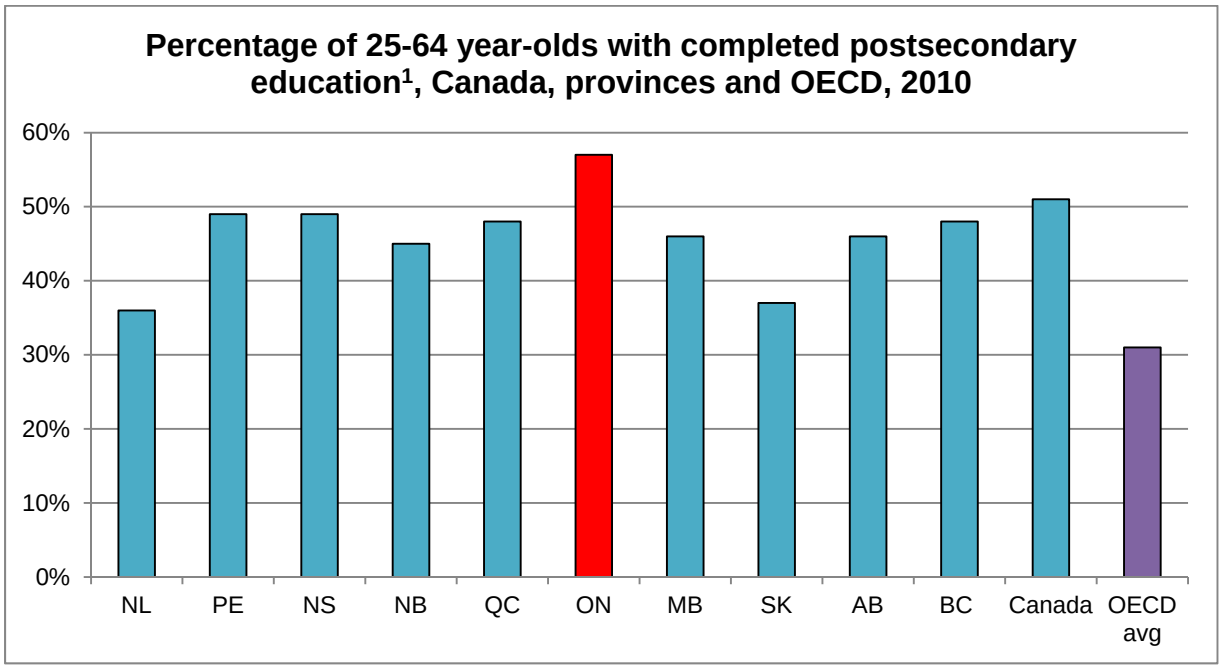
An International Snapshot on the Educational Attainment of Canadians

Whereas the participation rate measures the proportion of the population attending a college or university, the attainment rate measures the proportion of the population who have a postsecondary credential. All other things being equal, these two factors are related: the more people attend (participation), the more will end up with a postsecondary credential (attainment).

Figure 8 compares the adult population attainment rate for Ontario with that of other Canadian provinces, and also with that of OECD countries. The graph shows the percentage of 25-64 year-olds with either a college or university credential. Journeypersons and other trades credential holders are not included.

Ontario is a world leader, an enviable position bolstered by the province's high rate of immigration. As HEQCO research has shown, postsecondary education is often viewed by recent immigrants as a means of social and economic mobility and they tend to have high rates of educational attainment.

Figure 8



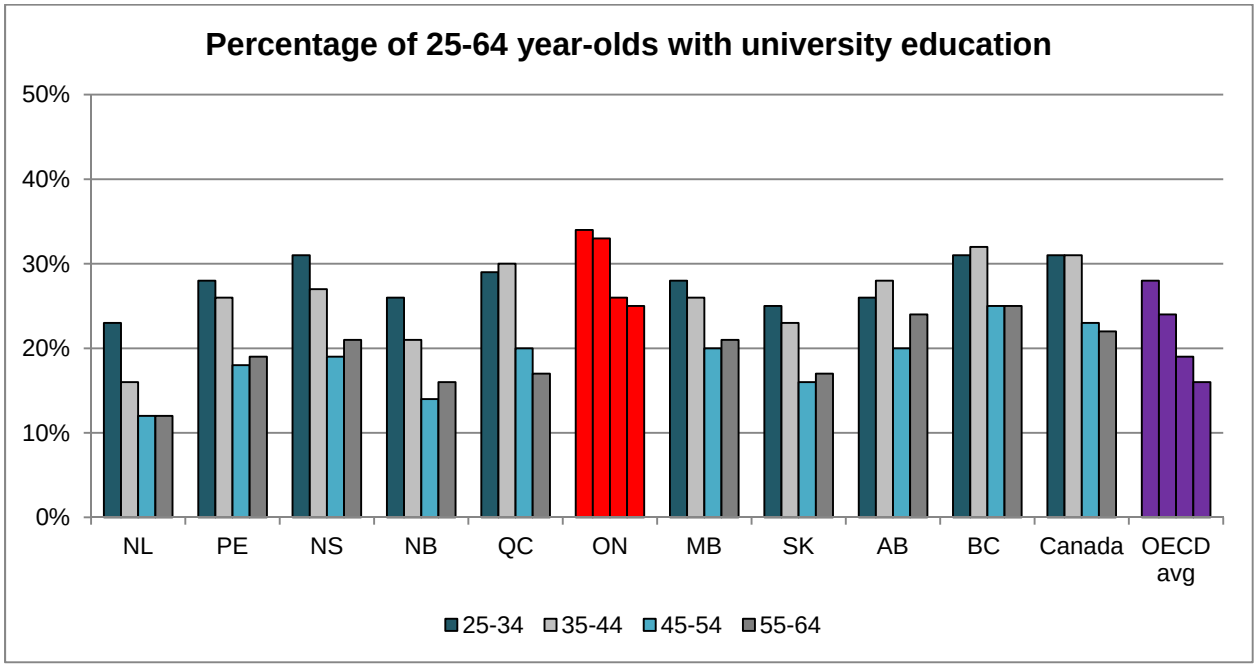
Sources: *Education Indicators in Canada: An International Perspective*, 2010. Statistics Canada, Labour Force Survey (LFS); Organisation for Economic Co-operation and Development (OECD), *Education at a Glance 2012: OECD Indicators.*[1] *Excludes trades and apprenticeship certifications.*

Figures 9 and 10 further break down the attainment data shown in Figure 8 by university and college attainment. It should be noted that international comparisons of this type typically suffer from complexities in translating what are at times very differently constructed educational systems into two generalized groupings, "university" and "college." The data are useful for the drawing of general conclusions, with a healthy respect for underlying definitional issues that should discourage detailed comparisons.

With this caveat in mind, one can nonetheless conclude that Ontario is among the top provinces in terms of both college and university attainment.

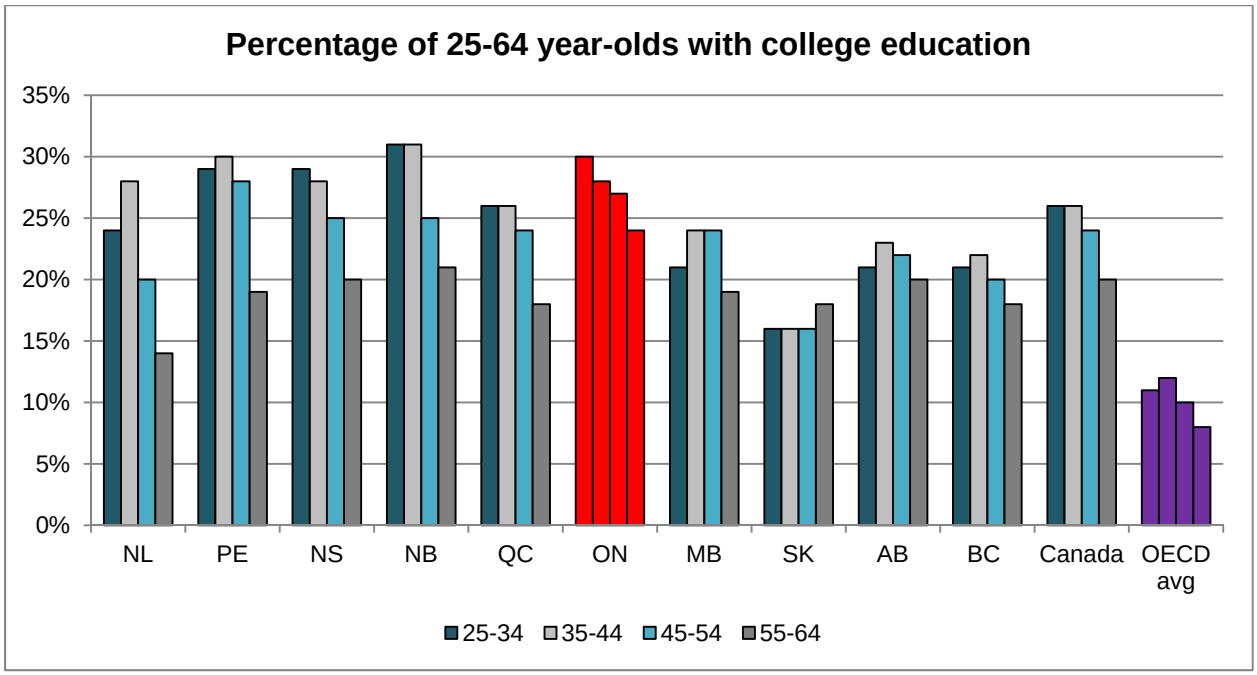
In Ontario, Canada and across the OECD, attainment is increasing – younger cohorts of adults have higher attainment rates.

Figure 9



Sources: *Education Indicators in Canada: An International Perspective*, 2010. Statistics Canada, Labour Force Survey (LFS); Organisation for Economic Co-operation and Development (OECD), *Education at a Glance 2012: OECD Indicators.*

Figure 10



Sources: *Education Indicators in Canada: An International Perspective*, 2010. Statistics Canada, Labour Force Survey (LFS); Organisation for Economic Co-operation and Development (OECD), *Education at a Glance 2012: OECD Indicators.*

Quality: The Next Frontier

We began this report by acknowledging the lack of consensus on meaningful definitions of postsecondary quality. We also identified the emerging and promising arena of learning outcomes – defining and measuring the skills institutions should teach and develop in their graduates. Learning outcomes are a focus of current HEQCO research and will likely form the basis for the next generation of core quality indicators. Learning outcomes can also integrate better information about the needs of employers who are hiring graduates into the evolving labour market. On this front, HEQCO is also undertaking research to develop better approaches to understanding employer skills needs.

Until robust measurement of learning outcomes is implemented, HEQCO canvasses a variety of proxy indicators that begin to suggest the state of quality in our colleges and universities. Advanced literacy, numeracy and problem-solving skills are ubiquitous postsecondary outcomes. In 2011 and 2012, Canada participated in PIAAC (the OECD's Programme for the International Assessment of Adult Competencies). Statistics Canada interviewed a sample of adults aged 16-65 years and with various levels of educational attainment, assessing their literacy and numeracy skills and their ability to solve problems in technology-rich environments. The data are scheduled to become available in the fall of 2013, and we look forward to reporting pan-Canadian, and possibly also international, comparisons of these core skills.

Canada and Ontario last participated in this survey (then called IALSS, the International Adult Literacy and Life Skills Survey) in 2003. The results are a decade old, and will serve as a useful benchmark to evaluate the changes Ontario and other provinces have effected over the past decade. Appendix A provides a review of Ontario's performance in 2003.

Students are unequivocal on their top reasons for seeking a postsecondary credential; they are decidedly job focussed, according to a recent HEQCO survey. And one of the first things employers look for when hiring graduates of Ontario's colleges and universities is relevant work experience. A dominant reason governments support public higher education is to graduate students with the skills and education to fill or create jobs in a knowledge-based economy.

Not surprisingly, in Ontario as with the rest of Canada, individuals with some type of postsecondary credential have much higher employment rates than those with only a high school diploma. Ontario's employment rate for college and university graduates is comparable to other provinces, and Ontario generally has held that position over the last decade, reflecting the province's ranking in overall employment rates. However, recent Ontario college and university graduates are not as likely as other provinces to report strong alignment between their education and their job.

More than 50% of recent college graduates in all provinces said their job is closely related to their education, and Ontario college graduates were least likely to say that this is the case. Similarly, recent Ontario university graduates were less likely than those of any province other than Nova Scotia and Prince Edward Island to report close alignment between their education and their job.

Meaningful quality measures should capture how well a postsecondary system graduates students with the right skills to succeed in the workforce. The province's middling performance in education-related employment indicators reinforces the importance of better alignment between postsecondary skills and labour market needs. Ontario needs to hear directly from employers on their assessment of, and satisfaction with, the knowledge and skill sets of postsecondary graduates. HEQCO is conducting a feasibility study on this issue, as well as exploring a national analysis of labour market needs. The goal is to link these data to the measurement of learning outcomes in postsecondary programs – aligning skills to what higher education institutions need to do.

Better news for Ontario is research performance, a generally accepted indicator of both quality and productivity. Ontario's universities lead Canada in research profile and output. Tri-Council funding per university faculty member has increased by 15% over the last decade, placing the province second only to Quebec. While research is not a primary expectation of college faculty, colleges are increasingly engaged in applied research and several Tri-Council grant competitions are targeted specifically to the college sector. In the 2010/11 NSERC competitions, Ontario colleges secured the second largest share of funding relative to provincial population (behind Quebec).

Finally, in terms of global competitiveness, Canada finds itself represented, but by no means a leader, among those countries that have universities placing in the top 100 in all three academic world rankings examined (Times Higher Education, Shanghai World Universities, and QS World Universities). While Ontario leads other provinces in having two universities in the Times Higher Education top 100 (University of Toronto and McMaster University), other provinces with substantially fewer universities also appear in one or more of the rankings examined (McGill University, Université de Montréal and University of British Columbia). HEQCO notes that these ranking schemes tend to focus on research-related indicators of performance, giving some context to Ontario's relatively strong performance in the pan-Canadian arena.

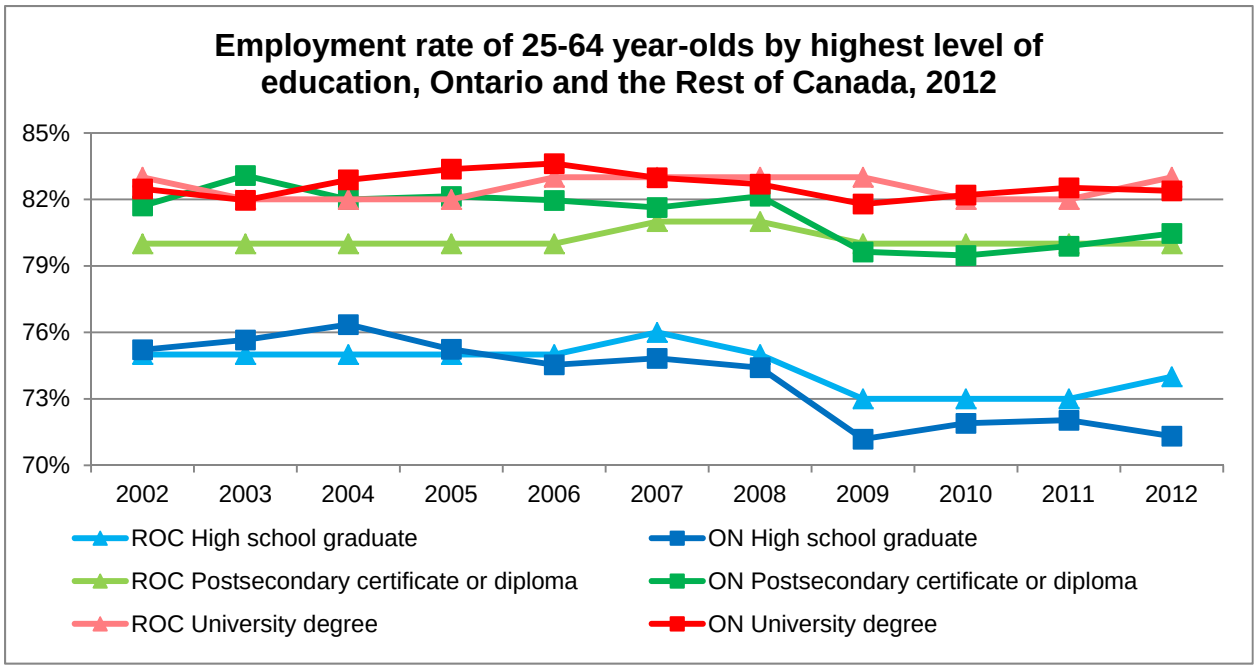
Quality: The data

A National Snapshot of Educational Attainment and Employment Levels

The relationship between employment rates and level of educational attainment is well established: higher levels of education correlate with higher rates of employment. In Figure 11 we present Statistics Canada's Labour Force Survey data to illustrate this fact, comparing Ontario to the rest of Canada by level of education.

In Ontario and in Canada, the employability gap between those with only high school education and those with higher education has grown in recent years.

Figure 11



Source: Labour Force Survey (LFS 282-0004).

A National Snapshot of the Relationship between Education and Work

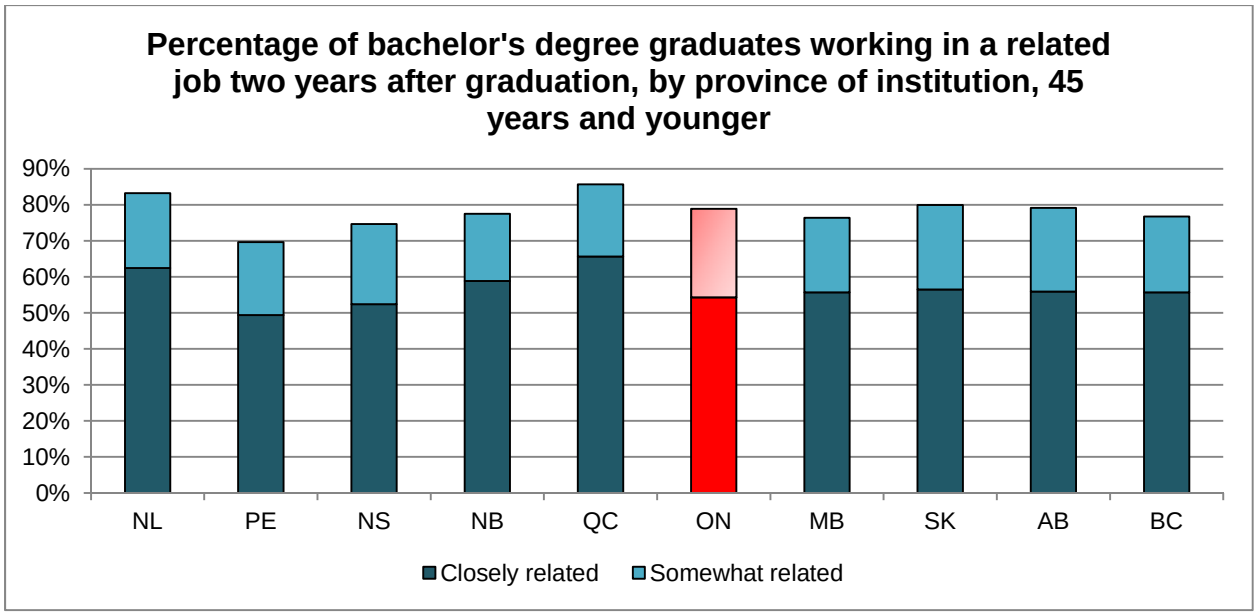
The connection between postsecondary studies and work is important – to students as an outcome of their investment, to government as a policy priority, to employers seeking the right skills fit.

Statistics Canada's National Graduate Survey (NGS) surveys college and university graduates across Canada two years after they graduate. They are asked if they are in the labour market, and whether they are employed. If so, they are asked whether they consider their job to be closely related, somewhat related, or not at all related to their postsecondary credential. The results of this "education-job relatedness" self-assessment are shown on Figures 12 and 13.

Figures 12 and 13 reflect a survey of college and university baccalaureate graduates in 2005, conducted in 2007, two years after graduation. The 2010 graduating class will be surveyed as well, and will provide an updated national assessment of education-job relatedness.

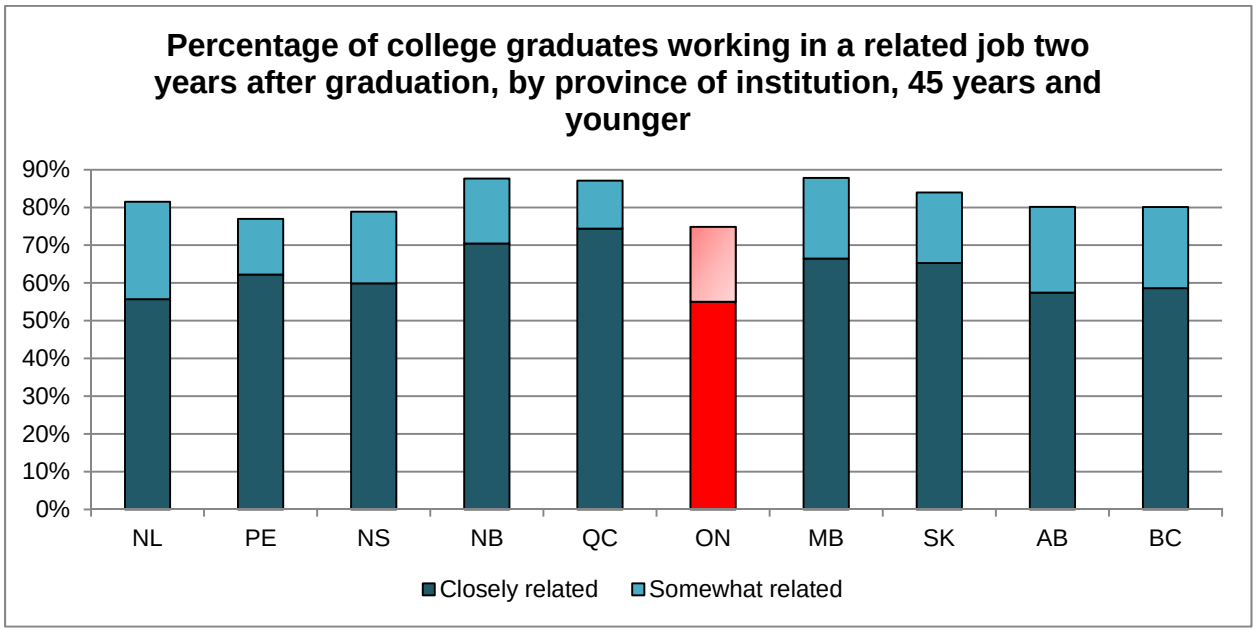
We note that the province of Ontario asks a similar question annually of college graduates six months after graduation. This is a different survey instrument, and the survey takes place much closer to graduation. Just to compare: in the Ontario survey, 60% of 2005 Ontario college graduates said they were employed in a job related to their program six months after graduation, and 9% were working in a job partially related. In the NGS (represented in Figure 13), 55% of 2005 Ontario college graduates said they were employed in a job closely related to their program two years after graduation, and 20% reported working in a job somewhat related.

Figure 12



Source: National Graduates Survey, 2007.

Figure 13



Source: Statistics Canada, National Graduates Survey, 2007.

Ontario's Share of Tri-Council Research Funding

Though the focus of this report has been primarily on the teaching and learning mission of colleges and universities, research is also an important core activity, primarily of the university sector.

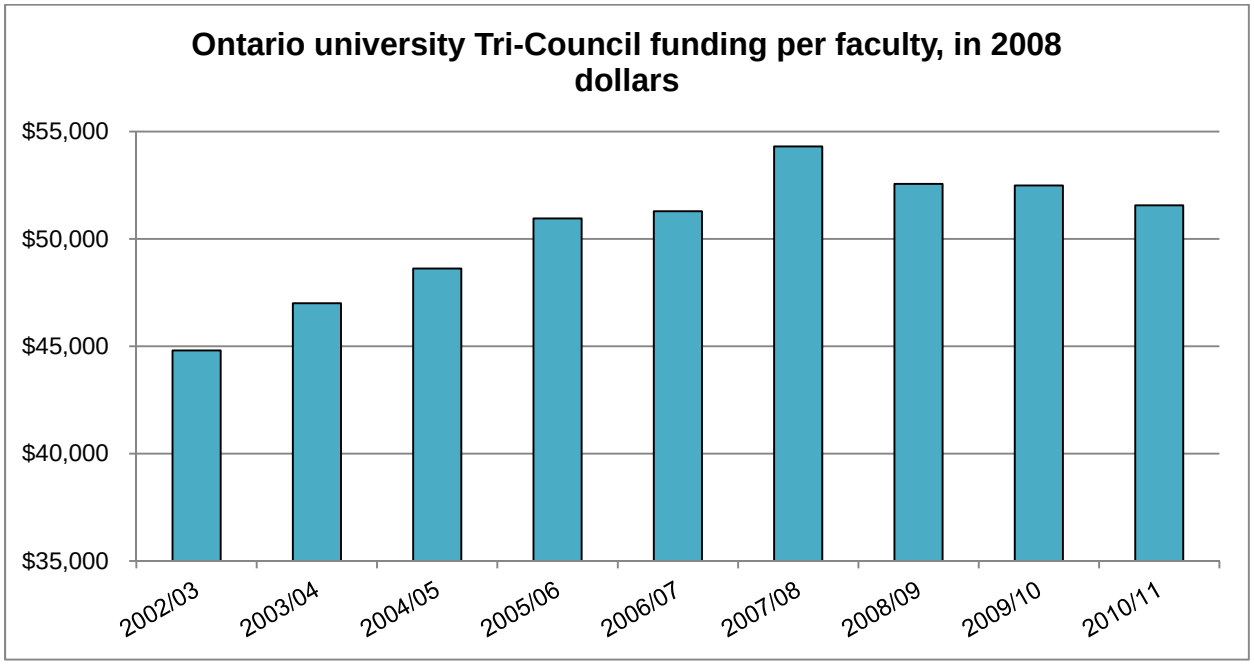
Canada's federal Tri-Council research funding agencies – the Natural Sciences and Engineering Research Council of Canada (NSERC), the Social Sciences and Humanities Research Council of Canada (SSHRC), and the Canadian Institutes of Health Research (CIHR) – are an important source of peer-reviewed research funding.

For universities, we show Tri-Council funding per faculty member, in order to normalize peer-reviewed research funding for the size of the researcher pool in each province. Figure 14 shows that Tri-Council funding per faculty member in the Ontario university sector has increased by 15% from 2002/03 to 2010/11, in 2008 dollars.

Looking across Canada, Table 2 shows that, in 2010/11, Ontario universities ranked second only to Quebec in Tri-Council funding per faculty member. (Not shown: Ontario ranked fourth in Canada between 2002 and 2004, third between 2005 and 2008, and second between 2009 and 2010.)

For colleges across Canada, applied research is a nascent activity and cannot be used to test or situate the relative strengths and profiles of institutions or provinces. Table 3 shows that, in 2011, Ontario colleges received Tri-Council funding roughly proportional to Ontario's share of the Canadian population.

Figure 14



Sources: CIHR Search Engine, NSERC Search Engine, SSHRC Search Engine and Statistics Canada.
Table 477-0018 - Number of full-time teaching staff at Canadian universities, Canada, Provinces, annual, CANSIM database.

Table 2

Ranking of Canadian provinces in Tri-Council funding per university faculty member in 2010/11, in actual dollars

Rank	Province	Funding per Faculty	Percentage Share of Funding	Percentage of Canadian Population	Total Funding
1	QC	$58,404	26%	24%	$562.4M
2	ON	$52,648	40%	38%	$858.5M
3	BC	$50,113	14%	13%	$306.9M
4	AB	$39,820	9%	11%	$193.0M
5	SK	$33,958	3%	3%	$56.4M
6	NS	$28,656	3%	3%	$62.2M
7	MB	$27,513	2%	4%	$48.9M
8	NL	$24,043	1%	2%	$22.7M
9	NB	$18,710	1%	2%	$23.0M
10	PE	$12,808	0%	0%	$3.2M
Canada		$47,561	100%	100%	$2,137.1M

Sources: CIHR Search Engine, NSERC Search Engine, SSHRC Search Engine and Statistics Canada. Table 477-0018 - Number of full-time teaching staff at Canadian universities, Canada, Provinces, annual, CANSIM database. Census Canada, 2011.

Table 3

Provincial ranking of share of funding received in college-targeted NSERC grant competitions in 2010/11 relative to each province's share of Canadian population

Rank	Province	Share of Funding	Percentage of Canadian Population	Total Funding
1	QC	39%	24%	$11,044,539
2	ON	35%	38%	$9,870,891
3	AB	14%	11%	$3,792,034
4	BC	6%	13%	$1,559,708
5	MB	2%	4%	$627,001
6	NB	2%	2%	$499,875
7	NS	1%	3%	$389,850
8	NL	1%	2%	$149,968
9	SK	0%	3%	$100,000
10	PE	0%	0%	$0
Canada		100%	100%	$28,033,866

Sources: NSERC Search Engine and Statistics Canada, Census Canada 2011.

A Snapshot of Ontario and Canada in University International Rankings

A jurisdiction's performance in international rankings of top institutions is not only a measure of performance, but also an important tool to promote that jurisdiction within the global community.

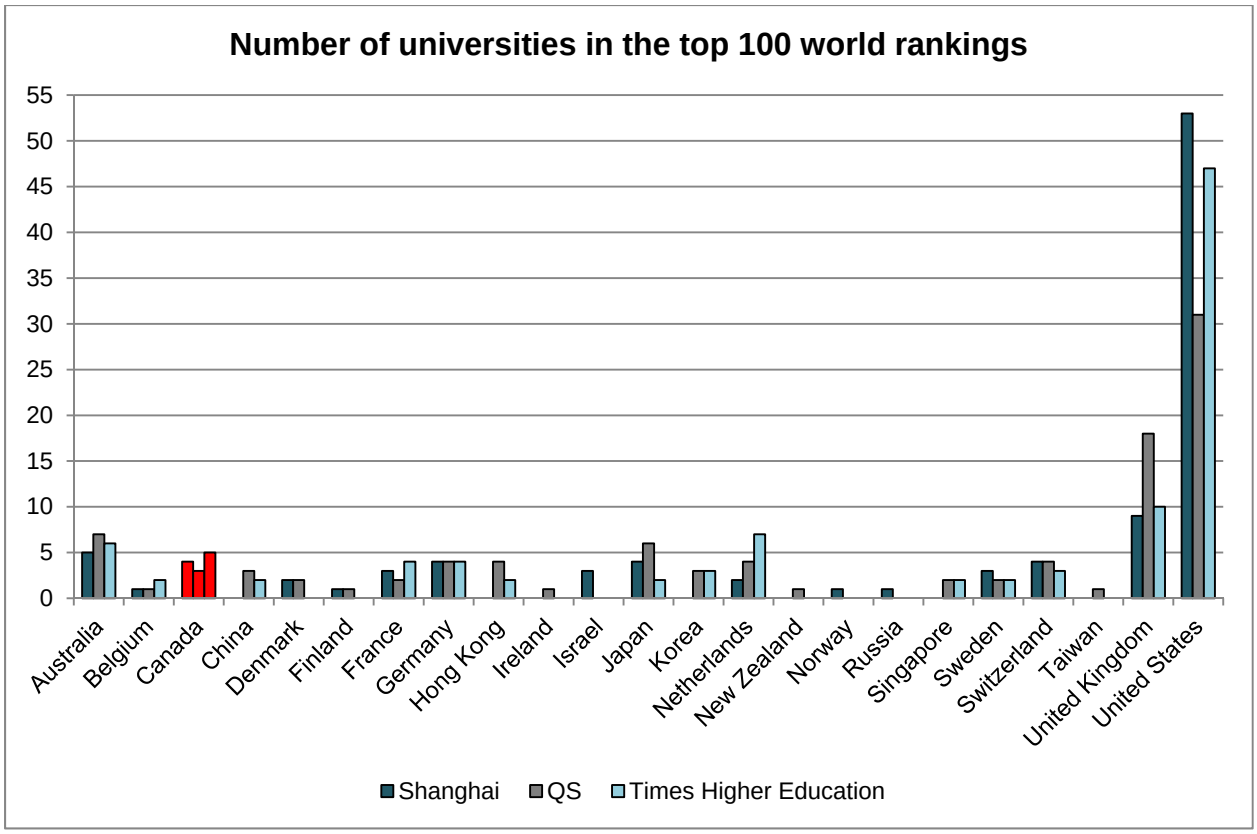
International ranking schemes assign performance scores to participating universities across the globe. Each scheme uses a different basket of performance measures. In most schemes, the baskets are heavily weighted to measures of research activity and/or impact.

In Figure 15, we present the 2012 results of three well-known rankings schemes for comparison: Academic Ranking of World Universities (Shanghai), QS World Rankings, and Times Higher Education Rankings. Top performing countries are identified by the number of universities they have in the top 100. The United States ranks first across all three schemes, and the United Kingdom second. Appendix B provides details about the ranking schemes used.

These data are not in any way adjusted for the relative size (as measured by population) of countries with institutions in the top 100. If the data were normalized for relative size, neither the United States nor the United Kingdom would appear at the top of the list. Canada would not rank in the top half of countries that place in the top 100 in any of the three university world rankings.

Three Canadian universities appear in all of the lists: the University of Toronto, McGill University, and the University of British Columbia.

Figure 15



Sources: Academic Ranking of World Universities (Shanghai) (2012), QS World University Rankings (2012), Times Higher Education Rankings (2012), World Bank, U.S. Census Bureau.

Productivity: Take a lesson

The challenge for postsecondary education is clear: provide high-quality education to more students with no more dollars. On that front, other Canadian provinces could take a lesson or two from Ontario, which a recent HEQCO report described as "already quite productive."

Ontario universities have received increased absolute levels of funding and funding per student since 2002, and have among the highest tuition fees in Canada. However, they are teaching more students per full-time faculty member with less money per student than all other Canadian provinces. Ontario also ranks eighth among the provinces in receiving the least funding per graduate.

The data available for colleges do not generally allow for inter-provincial comparisons, but in over-time comparisons, Ontario's colleges are receiving more funding per student than they were in 2002. However, they are also teaching and graduating more students per faculty member, and their operating funding per graduate in 2010/11 was 3% lower than in 2002/03.

All of this said, constrained resources and increased demand mean that Ontario's public postsecondary system cannot become complacent and must increase productivity to maintain and enhance quality. And, as HEQCO's recent report on productivity noted, measurement of the quality of education, especially the achievement of desired learning outcomes, is critical to improved productivity assessment. The report said that increased productivity could result from government redesign of the postsecondary system and how it is funded, and at the institutional level by attention to faculty workload distribution. A similar emphasis on outcomes-based funding was evident in Quality: Shifting the Focus, the response by a HEQCO-convened expert panel to Ontario college and university strategic mandate agreement submissions.

Productivity: The data

HEQCO's Productivity Report

Given the fiscal challenges facing Ontario, productivity will be a key preoccupation for all areas of public service, postsecondary education included.

In December 2012, HEQCO published *The Productivity of the Ontario Public Postsecondary Education System*. The report canvasses a range of productivity indicators in the domains of teaching (students and graduates per faculty, operating dollars per student and per graduate), research (Tri-Council funding per faculty as also summarized above, and research impact as measured by the Hirsh index of citations), and faculty workloads.

It is not our intent to republish the entire body of that recent report here. Rather, we have elected to highlight one important measure as a reminder: Ontario's performance in terms of operating dollars (the input of resources from government and students) per graduate (a desired end outcome of the learning journey).

Also, to place the business of postsecondary education in a greater perspective, we present a national summary of postsecondary operating funding as a percentage of gross domestic product (GDP).

Operating Dollars per Credential Awarded

As noted above, this information is recreated from our recent productivity report. Figure 16 shows operating dollars per university graduate across Canada in 2008/09.

By "operating dollars" we mean the combination of government grants and student tuitions, which make up the lion's share of institutional revenues, less the portion restricted for scholarships, as these revenues are not available to support ongoing teaching and learning.

We use a simple ratio, dollars over graduates. We have not attempted to factor in differences in average program length across the country, nor to adjust for differences in annual funding levels over the multi-year time span students spent at the included institutions. We have omitted Quebec from the analysis (Figures 16 and 19) due to the substantial difference in the structure of the Quebec CEGEP-based system relative to other Canadian provinces.

With Quebec omitted, Ontario and Nova Scotia are virtually tied as the most efficient provincial university systems on this measure.

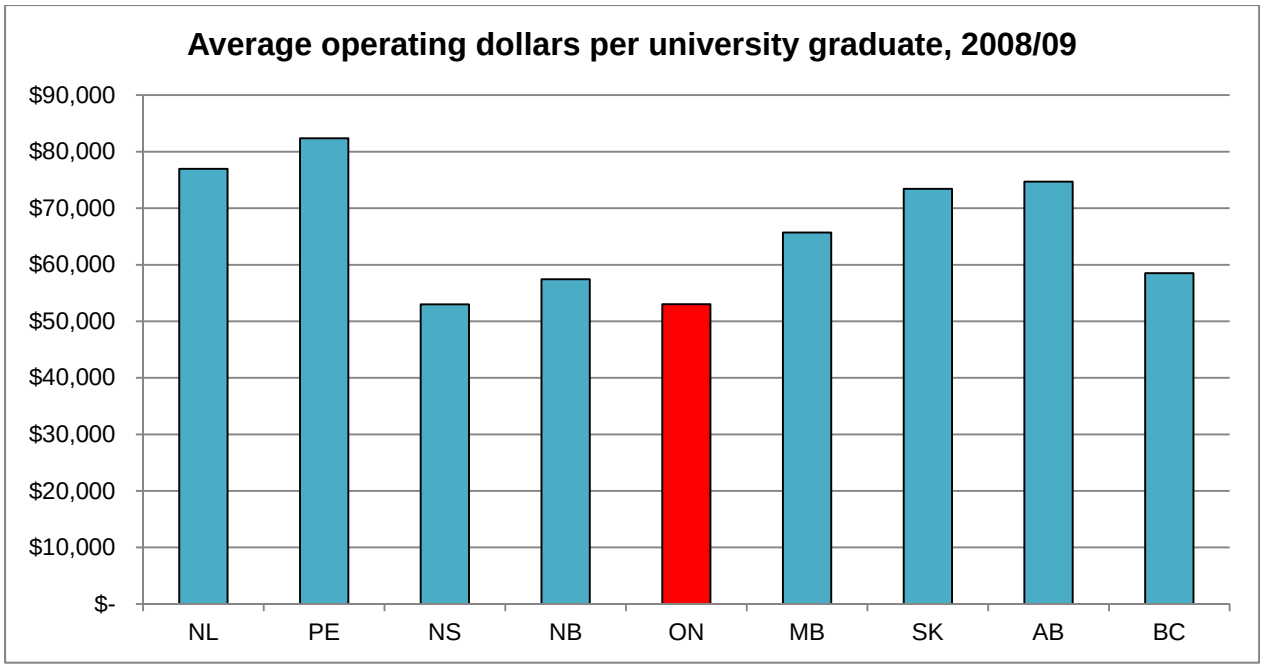
Figure 17 shows the average operating funding dollars per university graduate in Ontario over time, from 2002/03 through 2008/09. There was a 3% decrease in funding per graduate over that period.

Incomplete reporting of college graduate data to Statistics Canada makes it impossible to show a parallel analysis of cross-Canada college sector operating funding per graduate. We show instead in Figure 18

the average operating funding per college graduate in Ontario over the period 2002/03 through 2010/11. Figure 18 reveals that the operating funding per graduate that the college sector received in 2010/11 is slightly lower than what it received in 2002/03.

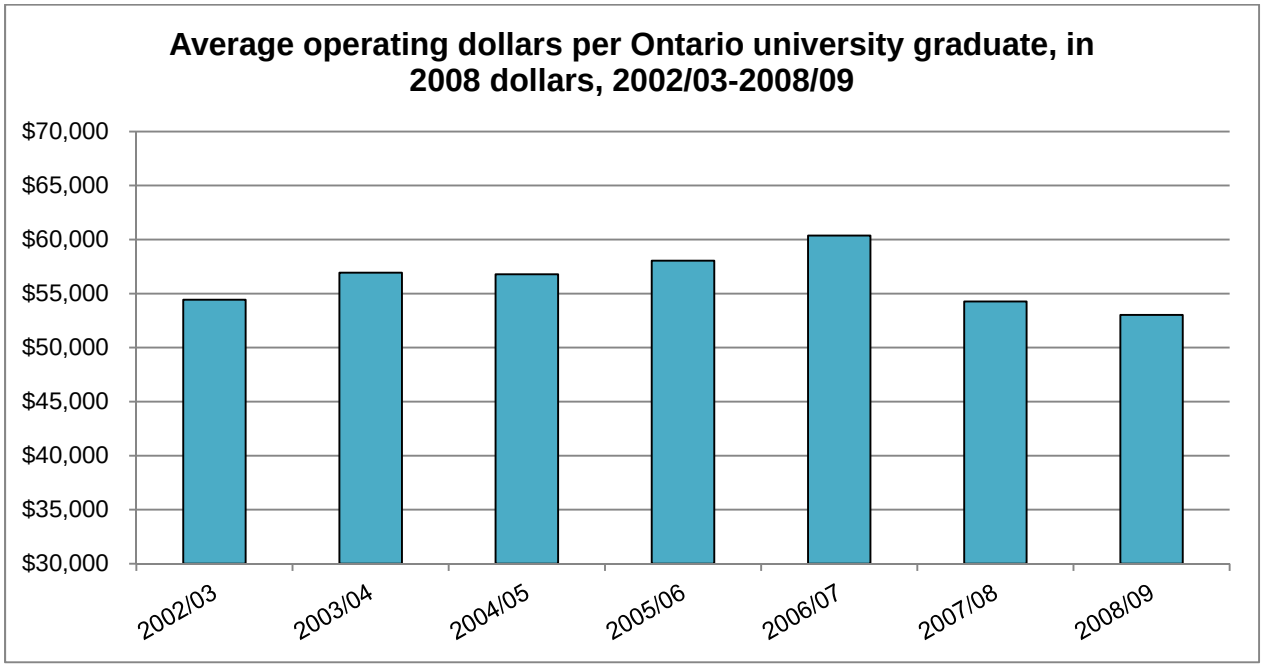
As we noted in the productivity report, this measure represents a valuable first step in analysing the productivity of the system from the perspective of one of its central objectives – bringing students to successful program completion.

Figure 16



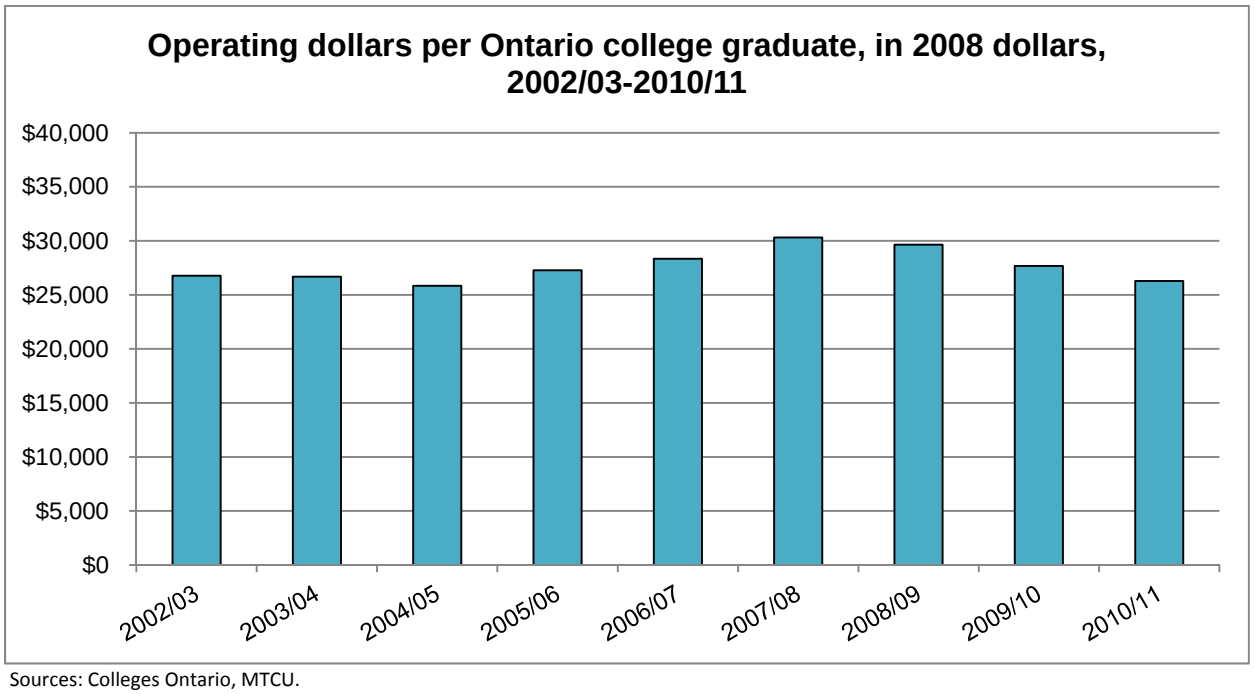
Sources: Canadian Association of University Business Officers (CAUBO) and Statistics Canada, Postsecondary Student Information System.

Figure 17



Sources: Canadian Association of University Business Officers (CAUBO) and Statistics Canada, Postsecondary Student Information System.

Figure 18



Sources: Colleges Ontario, MTCU.

A National Snapshot of Operating Dollars as a Percentage of GDP

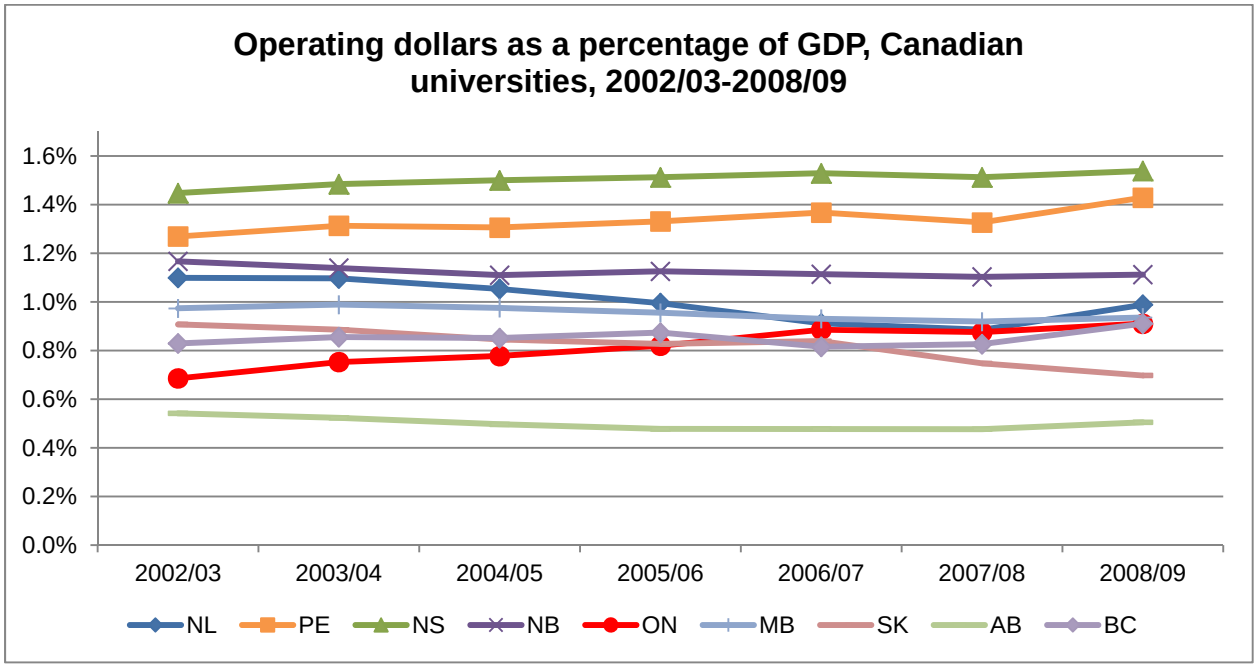
To place our investment in postsecondary education in the greater context of societal priorities, we show in Figure 19 university operating dollars as a percentage of provincial GDP.

We acknowledge that many factors will influence these ratios across the country, not all of which are a direct reflection of the "importance" of postsecondary education within the jurisdiction. For example, although Alberta has the second highest expenditure per university student in the country, its overall university expenditures as a percentage of GDP is lowest, in part reflecting the province's high overall GDP-based wealth.

Ontario has been steadily increasing its share of GDP expenditure on postsecondary education over the period shown in Figures 19 and 20. The increase corresponds with the steady increase in participation rates highlighted earlier in this report. Despite the increase in Ontario's overall postsecondary spending as a percentage of GDP, Ontario still has the lowest level of operating expenditures per university student, and the third lowest operating expenditure per graduate.

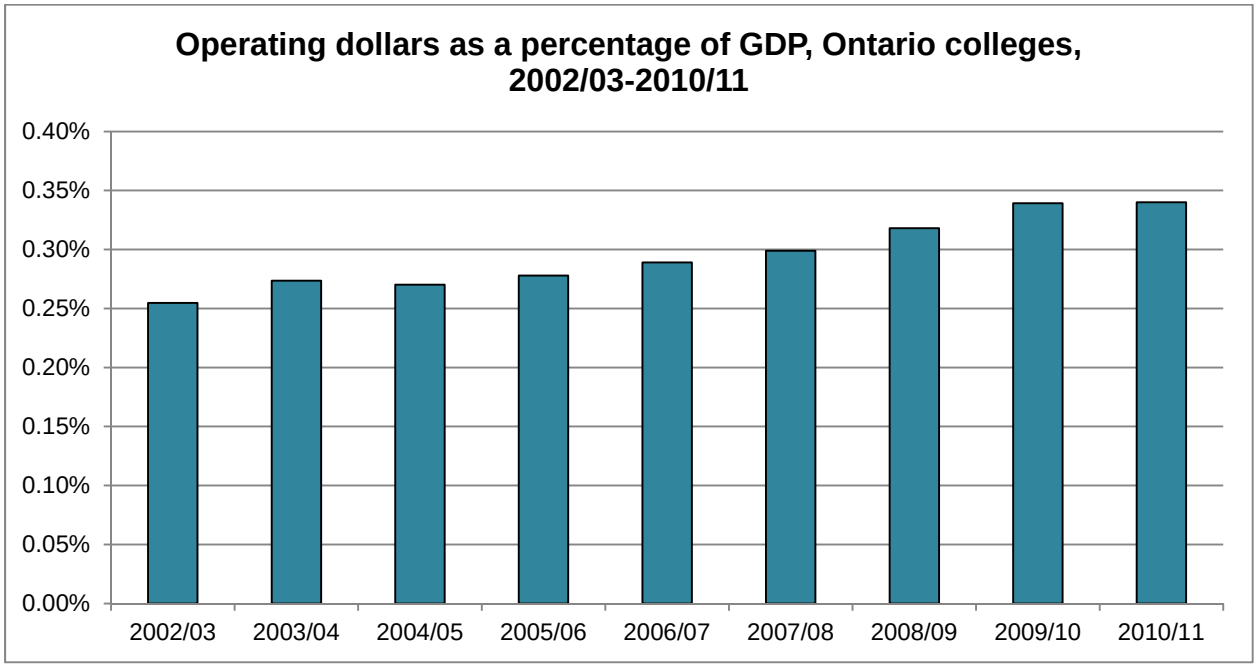
As before, an absence of data prohibits a similar cross-Canada presentation of college operating revenues as a percentage of GDP. We show instead in Figure 20 a timeline of Ontario college operating funding as a percentage of GDP for the period 2002/03 through 2010/11. This, too, has been increasing steadily over the period, as has the college participation rate.

Figure 19



Sources: Sources: Canadian Association of University Business Officers (CAUBO) and Statistics Canada. Table 384-0002 - Gross domestic product (GDP), expenditure-based, provincial economic accounts, annual (dollars).
Note: Quebec has been omitted from this analysis due to the substantial difference in the structure of PSE within Quebec relative to other Canadian provinces.

Figure 20



Sources: Colleges Ontario, Ontario Ministry of Training, Colleges and Universities (MTCU), and Statistics Canada – Table 384-0002 and 384-0038 - Gross domestic product (GDP), expenditure-based, provincial economic accounts, annual (dollars).

Social Impact: Education matters

A powerful motivator for individuals and government alike to invest in postsecondary education relates earnings and economic returns – higher lifetime earnings and job stability for individuals, enhanced economic output and tax revenues for society. But the returns are broader than just monetary.

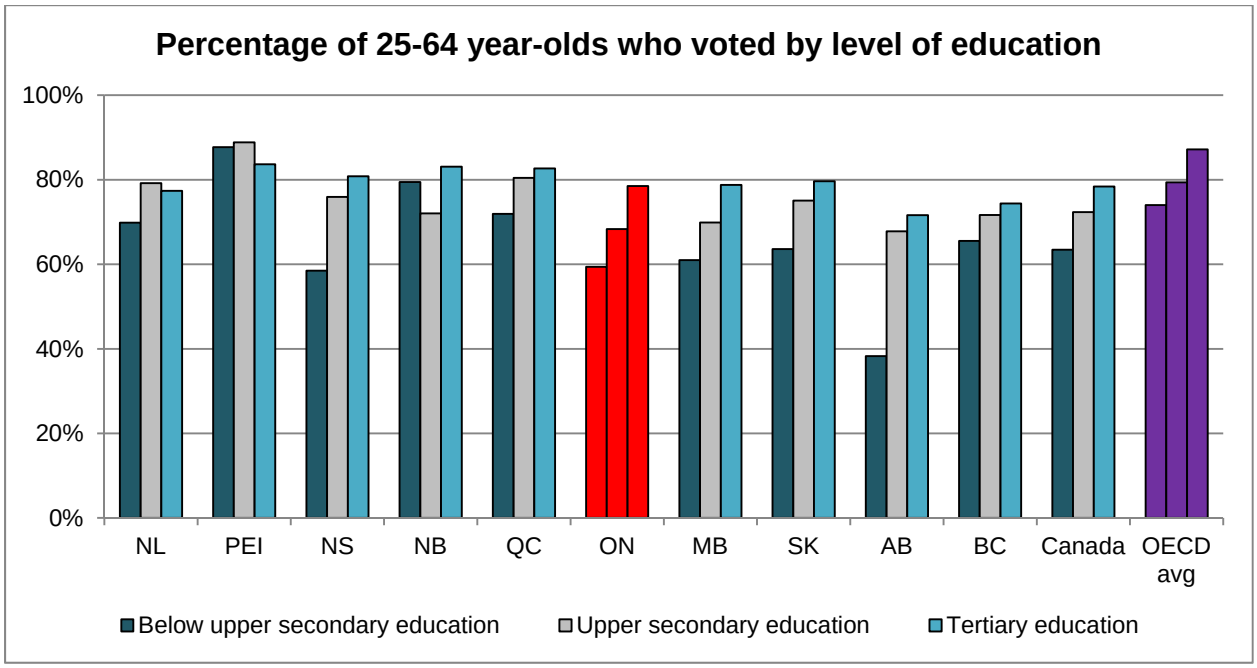
Measuring the social impact of education is currently as much art as science and it's important to note that the indicators used in this first report are inevitably tied to other issues, such as employment and income. We explored two forms of civic engagement (voting and volunteering), as well as life satisfaction, and on all three indicators, Ontario's performance generally mirrors the country's; Canadians tend to be more satisfied with their lives, more likely to volunteer and less likely to report having voted than the OECD average. Education matters, because in Ontario, as in the rest of Canada, higher levels of education tend to travel in the same circles as volunteers, voters and satisfied people.

Social Impact: The data

It is well known that higher education is linked to higher levels of social engagement and life satisfaction. We highlight these relationships in Figures 21 through 23 by using data from Statistics Canada's General Social Survey (Cycle 22), linked to comparable survey information from the OECD.

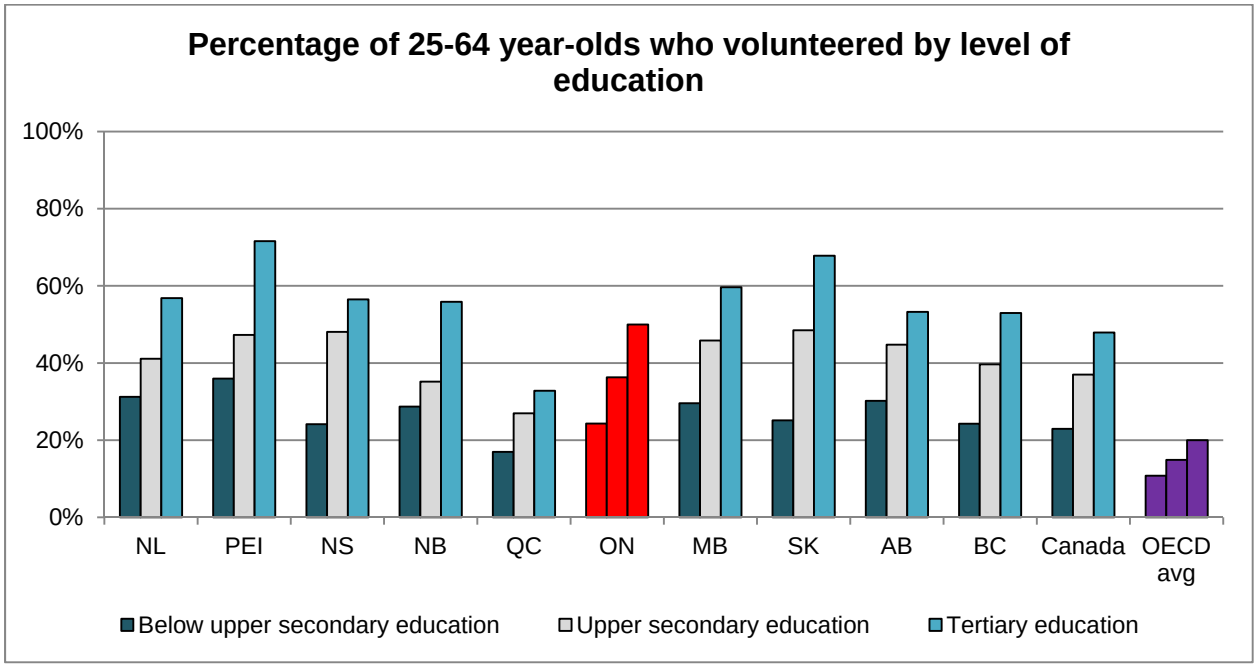
The three tables speak to federal voting rates, volunteering rates, and life satisfaction as reported by those with: 1) less than a high school diploma, 2) a high school diploma, some postsecondary education and trade/technical diploma/certificate, and 3) completed college or university credential. While there is a positive correlation between level of education and social engagement/life happiness, that is not to suggest a causal relationship between them.

Figure 21



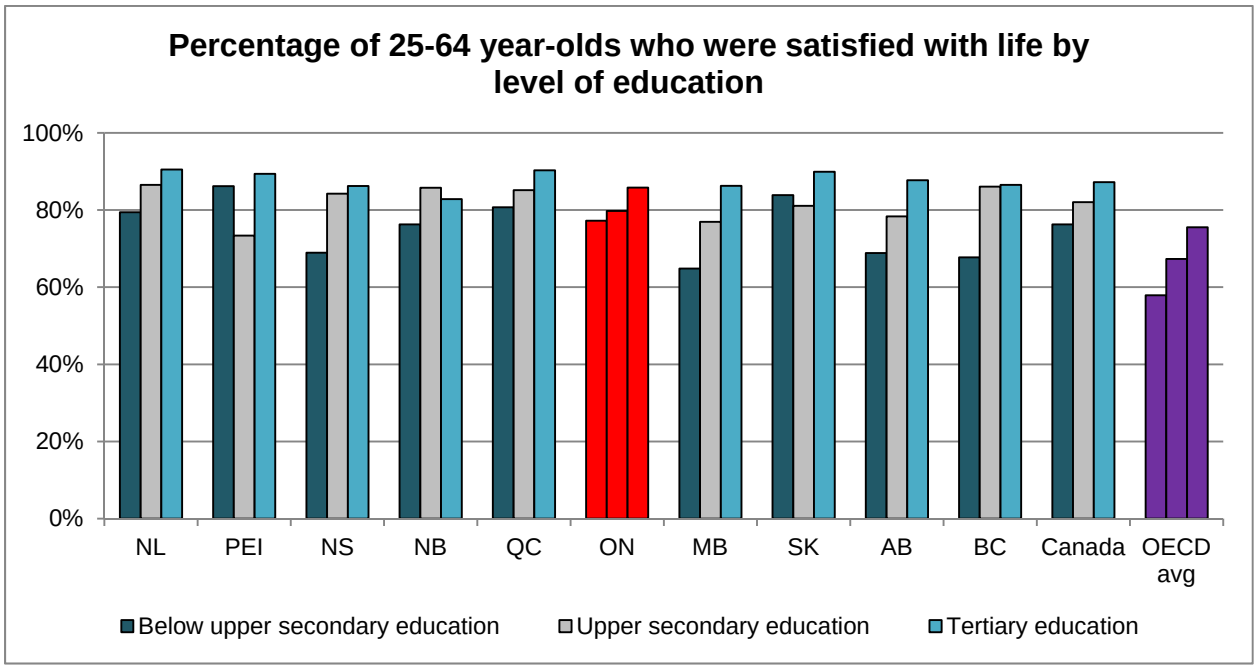
Sources: Statistics Canada, General Social Survey, 2008 and Organisation for Economic Co-operation and Development (OECD), *Education at a Glance 2011: OECD Indicators.*

Figure 22



Source: Statistics Canada, General Social Survey, 2008 and Organisation for Economic Co-operation and Development (OECD), *Education at a Glance 2011: OECD Indicators.*

Figure 23



Source: Statistics Canada, General Social Survey, 2008 and Organisation for Economic Co-operation and Development (OECD), *Education at a Glance 2011: OECD Indicators.*

Last words

Postsecondary education pays dividends to both individuals and society as a whole on a number of indicators of civic engagement and quality of life.

Ontario has made this desirable outcome available to a large proportion of its citizens through an impressive track record of increased access, and has a highly educated population. The province has accomplished this while maintaining a relatively productive system, which looks lean compared to other provinces.

As good as this is, there are three challenges to be met. The first is the relentless pursuit of quality, so that all of the access and opportunity Ontario has provided remains tightly tied to good educational outcomes and rewarding employment prospects for graduates.

Second is the effective use of resources to protect and enhance quality in an environment of fiscal restraint.

The final challenge is to fix the deficiencies in data collection so that we can measure the successes of the system with confidence. HEQCO recommends the following actions:

- Statistics Canada's valuable postsecondary data systems need to be renewed, updated and appropriately populated with administrative data from institutions and/or provinces/territories. This is especially important for colleges, where under-reporting in a number of provinces has so undermined the data set that HEQCO was largely unable to generate pan-Canadian indicators of college system performance. HEQCO is working closely with Statistics Canada to help meet these challenges and ensure that Statistics Canada's and contributing partners' investments in these data systems pay dividends in supporting evidenced-based decision making across the country.

- Learning outcomes, which allow for direct measurement of the "value added" that institutions deliver to their students in general and discipline-specific skills, need to be advanced to the point where they are defined, delivered, and measured. HEQCO is engaging in research and on-the-ground institutional implementation projects to advance all aspects of Ontario's learning outcomes framework, including the measurement challenge.

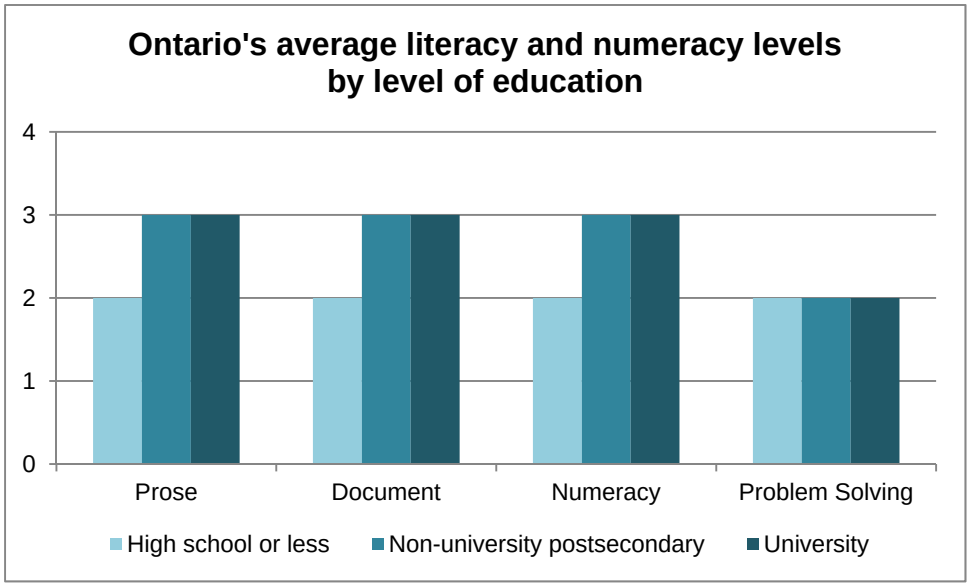
- A key input to relevant learning outcomes is information about the needs of the labour market – what do employers need from our graduates, and how must the sector respond to meet these needs. HEQCO is conducting research into the feasibility and design of a national employer survey, a key tool in closing this data gap.

- Established players, including the 13 provinces and territories, Statistics Canada and the Council of Ministers of Education Canada, need to better coordinate and pool their data capacity, and should establish a shared vision and work plan for enhancing pan-Canadian data and indicators. HEQCO is ready to play a role in leading this coordination effort.

Appendix A. 2003 IALSS International Literacy and Numeracy Test Results for Ontario

Literacy and numeracy proficiency is measured in raw scores, but are often converted to levels (1-5) to reflect mastery over certain tasks. Level 3 is considered to be the minimum proficiency level needed to function well in the workplace and cope with the demands of everyday life. Ontarians with a high school diploma or less do not, on average, meet this proficiency level while postsecondary graduates, on average, do. Notable are the low scores associated with problem solving. Raw scores associated with problem solving tasks do not correspond to the same levels used for all other measures of literacy and numeracy (see Table A.3).With that said, Ontarians did not score very well on this measure in 2003, and in fact, university graduates in Ontario fell short of the Canadian average (level 3).

Figure A.1



Source: Statistics Canada, International Adult Literacy and Life Skills Survey, 2003.

Looking at prose literacy only in Table A.1, we can see that Ontarians were keeping pace with the national average in 2003 – approximately half of our population was working at a level 3 or higher.

Table A.1

Population (ages 16-65) by prose literacy level, Ontario and Canada, IALSS 2003

	Canada	Ontario
Level 1	19.9%	21.3%
Level 2	27.8%	26.7%
Level 3	35.4%	35.0%
Levels 4/5	17.0%	17.0%

Source: Essential Skills Ontario, 2012.

Tables A.2 and A.3 describe how raw scores are converted into competency levels for each of the areas tested.

Table A.2

	Prose	Document	Numeracy
Level 1 (0-225)	Most of the tasks in this level require the respondent to read relatively short text to locate a single piece of information that is identical to or synonymous with the information given in the question or directive. If plausible but incorrect information is present in the text, it tends not to be located near the correct information.	Tasks in this level tend to require the respondent either to locate a piece of information based on a literal match or to enter information from personal knowledge onto a document. Little, if any, distracting information is present.	Tasks in this level require the respondent to show an understanding of basic numerical ideas by completing simple tasks in concrete, familiar contexts where the mathematical content is explicit with little text. Tasks consist of simple, one-step operations such as counting, sorting dates, performing simple arithmetic operations or understanding common and simple per cents such as 50%.
Level 2 (226-275)	Some tasks in this level require respondents to locate a single piece of information in the text; however, several distractors or plausible but incorrect pieces of information may be present, or low-level inferences may be required. Other tasks require the respondent to integrate two or more pieces of information or to compare and contrast easily identifiable information based on a criterion provided in the question or directive.	Tasks in this level are more varied than those in Level 1. Some require the respondents to match a single piece of information; however, several distractors may be present, or the match may require low-level inferences. Tasks in this level may also ask the respondent to cycle through information in a document or to integrate information from various parts of a document.	Tasks in this level are fairly simple and relate to identifying and understanding basic mathematical concepts embedded in a range of familiar contexts where the mathematical content is quite explicit and visual with few distractors. Tasks tend to include one-step or two-step processes and estimations involving whole numbers, benchmark per cents and fractions, interpreting simple graphical or spatial representations, and performing simple measurements.
Level 3 (276-325)	Tasks in this level tend to require respondents to make literal or synonymous matches between the text and information given in the task, or to make matches that require low-level inferences. Other tasks ask respondents to integrate information from dense or lengthy text that contains no organizational aids such as headings. Respondents may also be asked to generate a response based on information	Some tasks in this level require the respondent to integrate multiple pieces of information from one or more documents. Others ask respondents to cycle through rather complex tables or graphs containing information that is irrelevant or inappropriate to the task.	Tasks in this level require the respondent to demonstrate understanding of mathematical information represented in a range of different forms, such as in numbers, symbols, maps, graphs, texts, and drawings. Skills required involve number and spatial sense, knowledge of mathematical patterns and relationships and the ability to interpret proportions, data and statistics embedded in relatively simple texts

	that can be easily identified in the text. Distracting information is present, but is not located near the correct information.		where there may be distractors. Tasks commonly involve undertaking a number of processes to solve problems.
Level 4 (326-375)	These tasks require respondents to perform multiple feature matches and to integrate or synthesize information from complex or lengthy passages. More complex inferences are needed to perform successfully. Conditional information is frequently present in tasks at this level and must be taken into consideration by the respondent.	Tasks in this level, like those at the previous levels, ask respondents to perform multiple-feature matches, cycle through documents, and integrate information; however, they require a greater degree of inference. Many of these tasks require respondents to provide numerous responses but do not designate how many responses are needed. Conditional information is also present in the document tasks at this level and must be taken into account by the respondent.	Tasks at this level require respondents to understand a broad range of mathematical information of a more abstract nature represented in diverse ways, including in texts of increasing complexity or in unfamiliar contexts. These tasks involve undertaking multiple steps to find solutions to problems and require more complex reasoning and interpretation skills, including comprehending and working with proportions and formulas or offering explanations for answers.
Level 5 (376-500)	Some tasks in this level require the respondent to search for information in a dense text that contains a number of plausible distractors. Others ask respondents to make high-level inferences or use specialized background knowledge. Some tasks ask respondents to contrast complex information.	Tasks in this level require the respondent to search through complex displays that contain multiple distractors, to make high-level text-based inferences, and to use specialized knowledge.	Tasks in this level require respondents to understand complex representations and abstract and formal mathematical and statistical ideas, possibly embedded in complex texts. Respondents may have to integrate multiple types of mathematical information, draw inferences, or generate mathematical justification for answers.

Source: Learning a Living: Initial Results of the Adult Literacy and Life Skills Survey.

Table A.3

Problem Solving	
Level 1 (0-250)	At a very elementary level, concrete, limited tasks can be mastered by applying content-related, practical reasoning. At this level, people will use specific content related schemata to solve problems.
Level 2 (251-300)	The second level requires at least rudimentary systematical reasoning. Problems at this level are characterized by well-defined, one-dimensional goals; they ask for the evaluation of certain alternatives with regard to transparent, explicitly stated constraints. At this level, people use concrete logical operations.
Level 3 (301-350)	At the third level of problem-solving proficiency, people will be able to use formal operations (e.g., ordering) to integrate multi-dimensional or ill-defined goals, and to cope with non-transparent or multiple dependent constraints.
Level 4 (351-500)	At the final and highest level of competency, people are capable of grasping a system of problem states and possible solutions as a whole. Thus, the consistency of certain criteria, the dependency among multiple sequences of actions and other "meta-features" of a problem situation may be considered systematically. Also, at this stage people are able to explain how and why they arrived at a certain solution. This level of problem-solving competency requires a kind of critical thinking and a certain amount of meta-cognition.

Source: Learning a Living: Initial Results of the Adult Literacy and Life Skills Survey.

Appendix B. International Rankings

Table B.1

International Rankings - Performance Indicators					
Times Higher Rankings	**International Outlook:** People, Research (7.5%)	**Research:** Volume, Income, Reputation (30%)	**Citations:** Research Influence (30%)	**Industry Income:** Innovation (2.5%)	**Teaching**: The Learning Environment (30%)
	Ratio of international students to domestic students (2.5%)	University's reputation for research excellence among peers (18%)	Number of times a university's published work is cited by scholars globally (all indexed journals from 2006-2011) (normalized to reflect variations in citation volume between different subject areas) (excludes institutions that publish less than 200 papers a year) (30%)	Amount of research income an institution earns from industry (scaled against the number of academic staff) (2.5%)	Academic reputation survey (15%)
	Ratio of international staff to domestic staff (2.5%)	University research income (normalized for each university's subject profile) (6%)			Ratio of staff to students (Institution's "total student numbers") (4.5%)
	Proportion of total research journal publications with at least one international co-author (normalized to account for a university's subject mix and uses 5-year window) (2.5%)	Number of papers in the academic journals indexed by Thomson Reuters per academic (scaled for university size and normalized for subject) (6%)			Ratio of awarded doctorates to awarded bachelor's degrees (2.25%)
					Number of doctorates awarded (Scaled against size as measured by the number of academic staff it employs) (6%)
					Institutional income (scaled against academic staff numbers; adjusted for purchasing power parity) (2.25%)

QS	**Academic Reputation from Survey (40%)**	**Employer Reputation from Survey (10%)**	**Citations per Faculty (from Sciverse Scopus) (20%)**	**Ratio - Faculty: Students (20%)**	**Proportion of Int'l Students (5%)**	**Proportion of Int'l Faculty (5%)**
			No self-citations; Use of FTE Faculty; Citations count for the last five years	Use of FTE Students (Undergrad and Grad); Use of FTE Faculty		
Academic Ranking of World Universities (Shanghai)	**Quality of Education:** Alumni Winning Nobel Prizes and Field Medals (10%)	**Quality of Faculty:** Staff Winning Nobel Prizes and Field Medals (20%)	**Quality of Faculty:** Highly Cited Researchers in 21 Broad Subject Categories (20%)	**Research Output:** Papers Published in Nature and Science (if no N&S, the weight is moved to other indicators) (20%)	**Research Output:** Papers Indexed in Science Citation Index-expanded and Social Science Citation Index (20%)	**Per Capita Performance:** Per Capita Academic Performance of an Institution (10%)
	Different weights are set according to period of obtaining degrees (100% for alumni obtaining degrees in 2001-2010, 90% for 1991-2000, 80% for 1981-1990, and so on until 10% in 1911-1920)	Staff must have worked at the institution at the time of award. Different weights granted for time period (100% after 2011, 90% for winners in 2001-2010, 80% for 1991-2000, 70% for 1981-1990, and so on until 10% in 1921-1930)	Not that if a "Highly Cited Researcher" has two or more affiliations, he/she was asked to estimate his/her weights (or number of weeks) for each affiliation	Time frame is 2007-2011. A weight of 100% is assigned for corresponding author affiliation, 50% for first author affiliation (second author affiliation if the first author affiliation is the same as the corresponding author affiliation), 25% for next, and 10% for all others. Only publications of "author" and "proceedings paper" were considered	Only publications of "author" and "proceedings paper" were considered. When calculating the total number of papers, a special weight of two was introduced for papers indexed in Social Science Citation Index	Weighted scores of the other five indicators divided by the number of FTE academic staff

Appendix C. Explanatory notes for figures and tables

Figure 1. Re: Percentage of Canadians enrolled in university by age group, 2010/11

- All
    - PSIS data represent program by program headcounts, leaving the possibility for double counting if students are enrolled in more than one program.

Figures 2--4. Re: Percentage of 18-24/25-30/31+ year-olds enrolled in university by province, 2002/03-2010/11

- All
    - PSIS data represent program by program headcounts, leaving the possibility for double counting if students are enrolled in more than one program.
- Saskatchewan
    - For the University of Saskatchewan, residency enrolments in the health-related programs are not included as of 2008/09 for enrolments.
    - Data for the University of Regina (2005-2008) are estimates.
- Alberta
    - The following institutions, previously colleges, changed to university status. As of the 2004/05 reporting year: Alberta College of Art and Design (Alberta); as of the 2009/10 reporting year: Grant McEwan University and Mount Royal University (Alberta).
- British Columbia
    - The following institutions, previously colleges, changed to university status. As of the 2005/06 reporting year: University College of the Cariboo and Open Learning Agency (British Columbia); as of the 2008/09 reporting year: Capilano College, Malaspina University College, Emily Carr Institute of Art and Design, Kwantlen University College and University College of the Fraser Valley (British Columbia).
- Ontario
    - PSIS data includes a number of affiliates and non-publicly-funded institutions. Their collective enrolments do not materially impact the analyses.

Figure 16. Re: Average operating dollars per graduate in the university sector, 2008/09

- Graduates are calculated for institutions included in both PSIS and CAUBO.
- The same provincial notes from Figures 2-4 apply.
- Graduates are calculated by calendar year and CAUBO data are for the fiscal year.
- Quebec
    - The graduate counts for the Quebec institutions up to and including 2008 do not include micro programs and attestations however, as of 2009, these are included.
- Statistics Canada, which provided the data behind this figure, prefers an alternative method of calculation, using a four year moving average of operating dollars to "match" the attributed time span a graduate may have spent at the institution. HEQCO has selected the simpler method of matching operating dollars in the year of graduation, in recognition that time frames to graduation may vary across provinces, and could not be factored into the production of this ratio.

Figure 18. Re: Average operating dollars per graduate in the Ontario college sector, in 2008 dollars, 2002/03-2008/09

- Note that graduation and funding years are not offset. Funding changes will not normally affect graduation numbers until two to three years after the change, which is not directly captured in this ratio.
- Graduates, including international students, from funded PSE programs. Graduation year, not reporting year.
- Operating dollars: MTCU college funding allocation and domestic tuition and international tuition; fiscal year basis.