



# The Productivity of the Ontario Public Postsecondary System

## Preliminary Report

Higher Education Quality Council of Ontario (HEQCO)

December 2012

**Cite this publication in the following format:**

Higher Education Quality Council of Ontario (2012). *The Productivity of the Ontario Public Postsecondary System Preliminary Report*. Toronto: Higher Education Quality Council of Ontario.

***The views expressed are those of HEQCO.  
© Queen's Printer for Ontario, 2012***

***With constrained resources and increased demand, Ontario's public postsecondary system must increase productivity to maintain quality.***

***Ontario's colleges and universities are already quite productive.***

***Increased productivity can result from government redesign of the postsecondary system and how it is funded, and at the institutional level by attention to faculty workload distribution.***

***Further critical information is required to better assess productivity and identify the most promising steps for improvement.***

## TABLE OF CONTENTS

Executive Summary	6
Preamble	8
Measuring productivity in higher education	9
The HEQCO process for measuring the productivity of the Ontario postsecondary system	10
The productivity of the Ontario public postsecondary system – measures	12
Teaching	13
Enrolment	13
Graduates	17
Research	22
Faculty Workload	25
Data Gaps	26
Appendices	
Appendix 1. Select bibliography of interesting reading about defining and measuring productivity in higher education	29
Appendix 2. List of Panel members and their affiliations	30
Appendix 3. Explanatory notes for figures and tables	31
Appendix 4. Description of H-scores	36

## LIST OF FIGURES

Figure 1. FTE student enrolments in the Ontario university sector	13
Figure 2. FTE student enrolments in the Ontario college sector	14
Figure 3. The average number of FTE students per full-time faculty member in the Ontario university sector	14
Figure 4. The average number of FTE students per full-time faculty member in the Ontario college sector	15
Figure 5. Average operating dollars per FTE student for Ontario universities (in 2008 dollars)	16
Figure 6. Average operating dollars per FTE student for Ontario colleges (in 2008 dollars)	17
Figure 7. Number of graduates from Ontario's university sector	17
Figure 8. Number of graduates from Ontario's college sector	18
Figure 9. Number of graduates per full-time faculty member in the Ontario university sector	18
Figure 10. Number of graduates per full-time faculty member in the Ontario college sector	19
Figure 11. Average operating dollars per graduate in the Ontario university sector (in 2008 dollars)	20
Figure 12. Average operating dollars per graduate in the Ontario college sector (in 2008 dollars)	21
Figure 13. Ontario university tri-council funding per faculty (in 2008 dollars)	22
Figure 14. Mean normalized H-scores of faculty members in universities in each province	24

## LIST OF TABLES

Table 1. A comparison of the university student-to-faculty ratio in Canadian provinces in 2009/10	15
Table 2. A comparison of university operating dollars per FTE student in Canadian provinces in 2008/09	16
Table 3. Provincial ranking of number of university graduates per full-time faculty member in 2009/10	19
Table 4. Provincial ranking of the average operating dollars per graduate in 2008/09 in the university sector	20
Table 5. Ranking of Canadian provinces in tri-council funding per university faculty member in 2010/11, in actual dollars	22
Table 6. 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, based on the 2011 Census	23
Table 7. Mean normalized H-scores of faculty in universities in each province	24
Table 8. College full-time faculty workload	25
Table 9. University full-time faculty workload	25

## EXECUTIVE SUMMARY

The fiscal situation in Ontario, coupled with continuing increased demand for postsecondary education, suggest that the postsecondary system and its institutions will have to increase productivity to sustain the same quality of education it now offers. This report presents a preliminary analysis of the productivity of the Ontario public postsecondary system to reveal where opportunities may exist to increase efficiency and productivity. We thank Colleges Ontario, the Council of Ontario Universities, and the Ministry of Training, Colleges and Universities (MTCU) for their advice and their collaboration with these analyses. This report was produced in a spirit of cooperation, giving us great optimism as we work together to address the challenges facing the Ontario postsecondary system. We also thank Statistics Canada for their valuable postsecondary databases and their assistance in the derivation of many of the inter-provincial comparisons in this report. Lastly, we thank members of the Expert Panel HEQCO assembled to guide, inform and support these preliminary analyses and preparation of this report.

There is considerable controversy about how best to measure productivity in higher education. This report uses measures generally understood to index productivity and therefore provides a set of relevant baseline measures of the Ontario system. Where possible, the productivity of Ontario's college and university sectors is compared to other Canadian provinces. This report also identifies informational and data gaps that must be addressed to provide an even better and more useful understanding of higher education productivity in Ontario.

Ontario universities have received increased absolute levels of funding and funding per student since 2002. Nonetheless, they are teaching more students per full-time faculty member with less money per student than all other Canadian provinces. They also lead Canada in research profile and output. A pilot study of four institutions suggests that full-time faculty teach approximately three and one half courses over two semesters. On average, faculty who are not research intensive, as defined by the universities themselves, teach a little less than a semester course more than those who are research active.

The data available for colleges do not typically permit inter-provincial comparisons. However, Ontario colleges are now teaching and graduating more students per faculty member with more funding per student than they were in 2002. In research competitions targeted to the college sector, Ontario receives a level of funding proportionate to the province's share of the population. There is a very detailed pan-Ontario system for distributing faculty workloads, and colleges report that the average college full-time faculty member is teaching about eight courses over two semesters.

Our analyses also suggest that the following information is necessary in the future to provide a more comprehensive and meaningful assessment of productivity in the Ontario system:

1. Measurement of the quality of education, especially the achievement of desired learning outcomes.
2. Better information on graduation rates. For this, we support MTCU's current initiative to implement universal use of the Ontario Education Number (OEN) at the postsecondary level. Ideally, a Canadian education number to track the movement of students between provinces is strongly recommended.

3. Better information from employers with their assessment of and satisfaction with the knowledge and skill sets of postsecondary graduates.
4. More detailed measurement of relevant information in the college sector, both within Ontario and across Canada.
5. A more granular description of the workloads of university faculty, organized particularly by type of faculty appointment, and linked to research output and the full range of responsibilities expected of the professoriate.

Our preliminary analyses suggest that the Ontario system is already quite productive. The opportunities for the biggest future productivity increases are likely to be derived from government changes in the design of the Ontario postsecondary system and how it is funded. For individual institutions, the greatest productivity opportunities may lie in greater flexibility in the distribution and deployment of their faculty resources, particularly in the distribution of workloads of individual faculty taking into account their relative contributions to teaching and research.



## PREAMBLE

On June 27, 2012, the then Minister of Training, Colleges and Universities, Glen Murray, wrote to the Presidents and Executive Heads of Ontario's public colleges and universities about a consultation process to motivate a transformation of the province's postsecondary system. In that letter, he asked the Higher Education Quality Council of Ontario (HEQCO) "to identify specific data elements that the ministry does not currently collect from institutions, but which are needed to improve the government's ability to make effective evidence-based decisions."

Further discussion between HEQCO and the Ministry of Training, Colleges and Universities (MTCU) clarified that the government's initial interest was to identify opportunities to improve postsecondary education within the financial constraints expected for the Ontario public sector. In essence, it sought a preliminary analysis of the productivity of the Ontario public postsecondary system and, in particular, exploration of opportunities or initiatives that might enhance the output of the system given the expected financial constraints. The government appreciated that these early analyses might be limited by the absence of good data or evidence so it also requested identification of information that would be needed to conduct more in-depth future analyses.

The timeliness and importance of a productivity analysis is suggested by a summary of the enrolment and financial pressures the Ontario postsecondary system is generally believed to be facing in the next several years.

Currently, universities suggest that they face a 2 to 3% gap between the annual increase of expenses and revenues. On the revenue side, decisions on Ontario's tuition fee policy, due for 2013/14, may impact the size of the gap. On the expenditure side, to date, universities have not succeeded in flattening wage increases, the single largest inflationary pressure on their budgets. Some universities suggest that the annual change to operating budgets to redress ongoing pension deficiencies, calculated on a going concern valuation basis (more will be needed to meet obligations for current service costs) may be in the order of about 3% of operating revenues. Universities must also address the considerable challenge of a growing deferred maintenance backlog. If the scenario comes to pass, and if the rate of inflation increases by 1%, universities could face a shortfall of 6 to 8% annually, at a time when they will be expected to take more students.

Although the cost drivers for colleges are not identical to those of universities, the overall financial situation of the college sector appears to be no better than that of universities. Over the past five years, colleges report that per student costs grew by about 4 to 5% per year. Per student operating funding (grants plus tuition) is not likely to keep pace. Colleges will face the same potential pressures as universities arising from tuition policy changes and inflation. Colleges also have a substantial documented deferred maintenance challenge. So, the college sector may also face a continuing future annual revenue shortfall of about 5 to 6% at a time when it too will be expected to enrol more students.

Given the financial and enrolment realities, the key to future success is to increase productivity in ways that do not compromise quality. Both Colleges Ontario<sup>1</sup> and the Council of Ontario Universities<sup>2</sup> recently issued reports describing innovations in colleges and universities that have the potential to accomplish this. Innovative approaches are both necessary but also challenging given that our institutions are already efficient and cost-effective as evidenced by the number of students they accommodate and graduate, in spite of some of the lowest per student operating funding in the country. However, the magnitude of the financial pressure facing the Ontario system as described above, and the global and other challenges described in MTCU's recent discussion paper,<sup>3</sup> collectively threaten the continued quality and competitiveness of Ontario's postsecondary system.

Bolder and broader changes will be needed if Ontario is to maintain a higher education system that students, the public and the province need and deserve. To meet current challenges, government will need to consider, among other items, broader and more systemic policy changes to increase productivity in defined directions or, as a minimum, to create a policy environment that enables and permits faster and bolder innovation at the institutional level.

The Productivity Project described herein is part of HEQCO's contribution to the analysis leading to these provincial policy changes. It is one of a set of HEQCO research projects on how to make Ontario's public postsecondary education system more productive and sustainable without compromising quality.<sup>4</sup> These projects are not an exercise in institutional rankings and are not driven simply by the need to reduce costs. Rather, consistent with HEQCO's legislated mandate,<sup>5</sup> they are designed to provide the evidence and data leading to a contemporary policy framework to improve higher education in Ontario, and this report should be taken in that spirit.

### **Measuring productivity in higher education**

Fundamentally, productivity measures the relationship between the outputs of a system and its inputs. The difficulty in productivity analyses is to agree on the relevant output and input measures, and this has proven to be particularly problematic in the case of higher education.

---

<sup>1</sup> Ontario's Colleges: Leading the Transformation to an Innovation Economy. June 2012.

<http://www.collegesontario.org/outcomes/Innovation%20Report%202012.pdf>

<sup>2</sup> Beyond the Sage on the Stage: Innovative and Effective Teaching and Learning at Ontario Universities

[http://www.cou.on.ca/publications/reports/pdfs/cou\\_beyond\\_the\\_sage\\_on\\_the\\_stage---teaching-and-le](http://www.cou.on.ca/publications/reports/pdfs/cou_beyond_the_sage_on_the_stage---teaching-and-le), and Innovative Ideas, Improving Efficiency at Ontario Universities <http://www.cou.on.ca/publications/reports/pdfs/innovative-ideas---improving-efficiency-at-ontario>

<sup>3</sup> English: <http://www.tcu.gov.on.ca/pepg/publications/DiscussionStrengtheningOntarioPSE.pdf>. French:

<http://www.tcu.govon.ca/epep/publications/DiscussionStrengtheningOntarioPSE-FR.pdf>.

<sup>4</sup> Aside from the processes identified here, HEQCO has recently completed two contracts initiating a comprehensive analysis of the consequences of two emerging trends – the greater use of online learning and the shift to competency-based credentialing – on the productivity, quality and cost of higher education programs, institutions and systems. We have begun an investigation of the degree to which accelerating times-to-completion can improve the productivity of the postsecondary system. We are also conducting an evaluation of the use of the Collegiate Learning Assessment and the Community College Learning Assessment to measure critical thinking in college and university students and are in the process of finalizing a set of metrics that represent an evaluation of the state of Ontario's postsecondary system (the Indicators Project). For more details about these projects, link to <http://heqco.ca/en-CA/Research/Funded%20Research/Pages/Home.aspx>

<sup>5</sup> Higher Education Quality Council of Ontario Act, 2005, S.O. 2005, c. 28, Sched. G.

[http://heqco.ca/SiteCollectionDocuments/heqco\\_act\\_2005\\_EN.pdf](http://heqco.ca/SiteCollectionDocuments/heqco_act_2005_EN.pdf)

A recent comprehensive report from an Expert Panel convened by the National Research Council in the United States entitled, “Improving Measurement of Productivity in Higher Education”<sup>6</sup> highlights the conceptual and methodological difficulties of measuring productivity in higher education. The Panel’s report contains several key messages:

1. The best productivity measures incorporate indices of both quantity and quality. As the Panel suggests, the desired and relevant productivity definition in higher education is the relationship between “quality adjusted outputs to quality adjusted inputs.” Yet, as the Panel notes, we do not yet have agreed-upon quality measures in higher education and so, in spite of its own admonition, the Panel’s paper provides a new measure of higher education productivity that ignores quality measurements. However, the Panel does suggest several ways that quality could be incorporated, however imperfectly, into current productivity analyses.
2. Different levels of aggregation and analysis (course versus department versus institution versus system) provide different conceptual and methodological challenges in measurements of productivity.
3. Higher education institutions with different mandates and missions require different productivity measures to capture inputs and outputs relevant to these distinct types of institutions.
4. Broadly speaking, and where appropriate, one can and should measure both “instructional” and “research” productivity since both represent core expectations of some postsecondary institutions. Curiously, the Panel’s own recommended measure of productivity completely ignores the domain of research.
5. Appropriate caution, context and interpretation must accompany any one-dimensional measures of productivity.
6. Any measurement regime is imperfect and can, and probably will, create incentives for gaming by institutions. Yet, the challenge of improving productivity in higher education is so acute and important that conducting the productivity analyses cannot be postponed until there is greater agreement on valid quality measures.

Other jurisdictions have attempted to measure the productivity of their postsecondary systems or institutions. These analyses are all tempered by the caveats and key messages provided by the National Academies Report. A short bibliography of some of the more informative recent analyses is provided in Appendix 1.

### **The HEQCO process for measuring the productivity of the Ontario postsecondary system**

Given the provincial charge to us, HEQCO assembled a Panel of informed advisors from the college and university sectors and government to guide and advise on the project. Panel members are listed in Appendix 2.

---

<sup>6</sup> National Research Council (2012). *Improving Measurement of Productivity in Higher Education*. Panel on Measuring Education Productivity: Conceptual Framework and Data Needs. Teresa A. Sullivan, Christopher Mackie, William F. Massy and Esha Sinha, eds. Committee on National Statistics and Board on Testing and Assessment, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

The Expert Panel met twice. The distillation of key issues and advice from the Panel is as follows:

1. HEQCO is best advised to pursue this project in phases. Phase 1, to end in Fall 2012, will serve two purposes: i) to provide the government with a preliminary analysis of the Ontario system's productivity using available data (or data that can be collected by then) and, ii) to identify the data gaps impeding better productivity analyses and recommend how these data gaps could be filled. Phase 2 would launch the data collection processes that will lead to a better understanding of the productivity of the system and the generation of policy changes that would spur productivity and innovation.
2. Given the short timeline and some concerns about the interpretation of the data currently available, the Phase 1 report is advised to provide productivity measures aggregated at the system or college sector/university sector<sup>7</sup> levels (i.e., specific institutions will not be identified). Given their differing mandates, there is a strong argument to report productivity separately for the college and university sectors.<sup>8</sup>
3. Productivity in Ontario can be assessed relative to the same measures in other jurisdictions or by revealing the change in that measure in Ontario over time. These approaches are not mutually exclusive and may be differentially relevant depending on the question being asked, who is asking it and for what purpose, and the pragmatic issue of availability of data. The most relevant comparator jurisdictions for Ontario are the other Canadian provinces.
4. A reasonable start point for time series analyses is 2002, because this allows examination of a 10-year trend and also allows the data capture to begin one year prior to the initiation of the double cohort.<sup>9</sup>
5. Because of the societal expectation that postsecondary institutions (universities for sure but increasingly colleges as well) will conduct research, some measures of research productivity should be included in any overall analysis of higher education productivity.
6. Quality is acknowledged to be the most difficult element to incorporate into a higher education productivity analysis. However, given current limitations in the measurement of "quality" in higher education, it will be difficult to incorporate any meaningful analysis of quality in Phase 1.

---

<sup>7</sup> We use the term "system" to refer to Ontario's public postsecondary system that comprises 24 colleges and 20 universities. We use the term "sector" to refer to components of that system; the two largest sectors are the "college sector" and the "university sector."

<sup>8</sup> Ultimately, HEQCO recognizes that productivity analysis at the institutional level is important to inform government policy direction and investment opportunities. For example, HEQCO's ongoing analysis of institutional Strategic Mandate Agreements benefits from an understanding of productivity at the institutional level.

<sup>9</sup> The Ontario double cohort refers to a one-time increase in Ontario postsecondary entrants in 2003, a consequence of the elimination of Grade 13 (the "OAC" year).

## **The productivity of the Ontario public postsecondary system – measures**

Recognizing that no single generally accepted approach has been established for measuring postsecondary productivity, we provide a series of measures to index the productivity of the Ontario public postsecondary system. These measures are presented in the categories of:

- Teaching:
  - Enrolment
  - Graduates (credentials awarded)
- Research
- Teaching workloads

For the most part, measures for the university and college sectors are presented separately. Typically, the university data permit cross-provincial comparisons, college data do not.

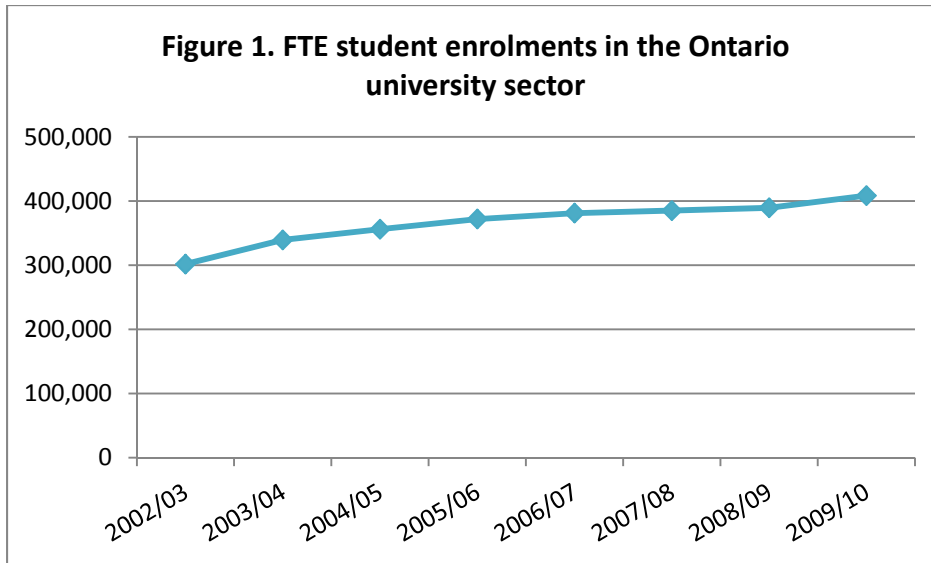
University productivity measures in this report are largely built on Statistics Canada data, as these data permit comparisons across Canadian provinces. It must be noted, however, that Statistics Canada values for many common postsecondary data may at times differ somewhat from those used by provinces, built on provinces' own administrative reporting protocols with institutions. We are confident that these differences are manageable and do not materially impact the observations or conclusions that may be drawn from an examination of the data. Explanatory notes for Figures and Tables are presented in Appendix 3.

Statistics Canada data for colleges suffer from under-reporting, and unresolved issues of aligning college mandates across the country. This report largely avoids inter-jurisdictional college comparisons, and instead uses Ontario administrative data to track trends within the college sector in the province over time.

## TEACHING

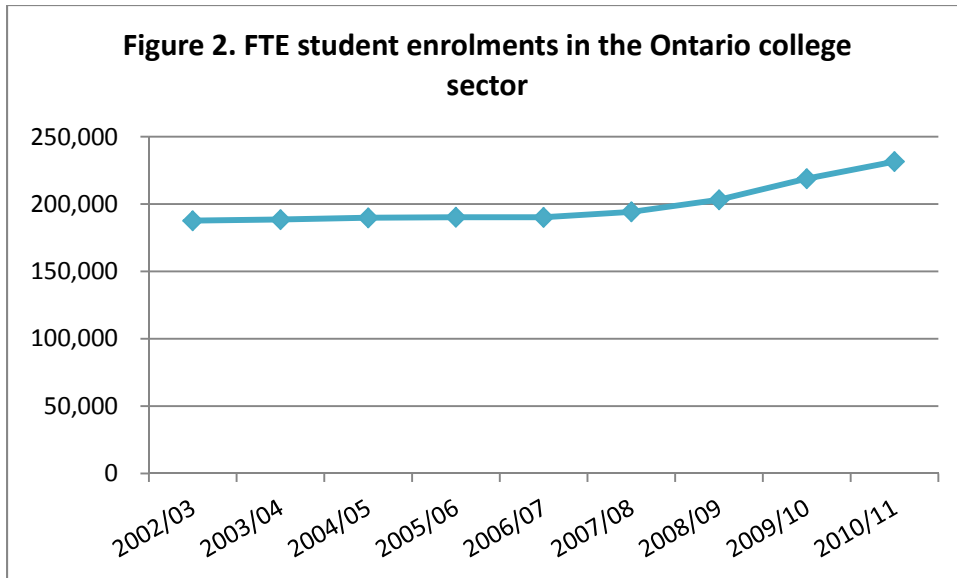
### Enrolment

Figure 1 presents the increase in full-time equivalent (FTE) students in the Ontario university sector from 2002/03 to 2009/10. Over this period, university enrolment (undergraduate and graduate combined) increased by 35%.



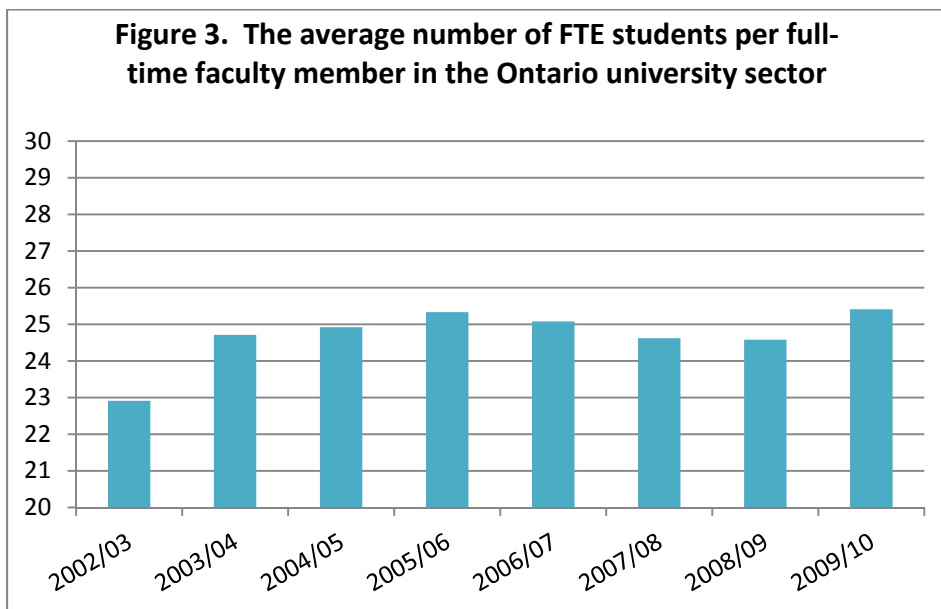
Sources: Statistics Canada, Postsecondary Student Information Systems (PSIS). Includes undergraduate and graduate enrolments.

Figure 2 shows the increase in Ontario college enrolment from 2002/03 through 2010/11. Over this period, college enrolment grew by 23% (17% to 2009/10). For the college presentation, provincial administrative data, not Statistics Canada, are used. Although there are differences in the timeframe available, both college and university data sets measure full-time equivalent provincial enrolment and validly present the overall trend over the past decade in each of these two sectors. Direct, mathematical comparisons, however, should be avoided given the choice of two data sets and slightly different timeframes.



Sources: Colleges Ontario, MTCU and Ontario College Application Service (OCAS)

In terms of productivity, Figure 3 shows the number of FTE students per full-time faculty (FTF) member in the Ontario university system. There has been a 12% increase in the number of students per faculty member in the Ontario university system from 2002/03 to 2009/10. This measure is typically referred to as the student-to-faculty ratio and is one of the standard measures used to assess the workload of faculty.



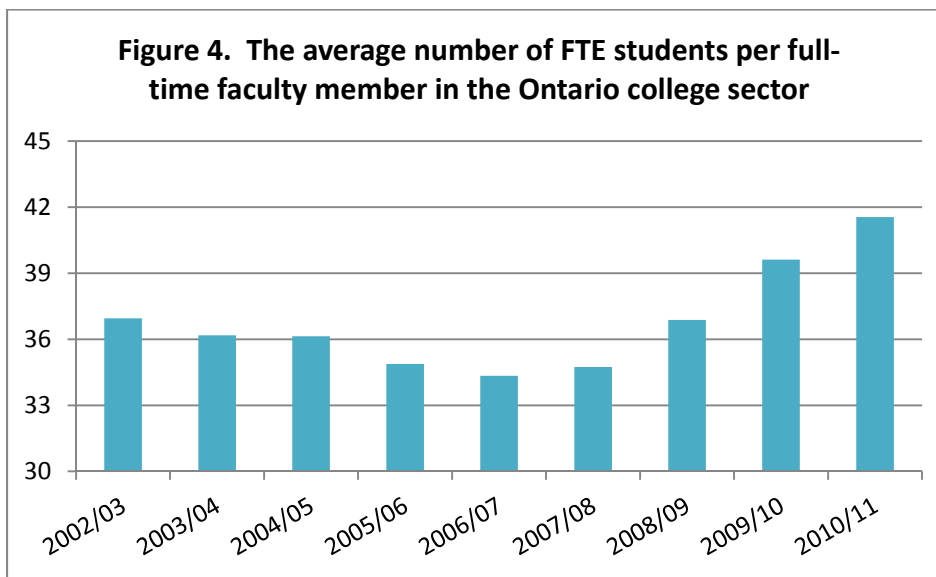
Sources: Statistics Canada, PSIS and University and College Academic Staff System (UCASS)

Table 1 reveals that Ontario has the highest student-to-faculty ratio among all Canadian provinces. It should be noted that the ratio does not incorporate the contribution of part-time faculty, which varies between institutions and would have some additional impact on overall student-to-faculty ratios across Canada. Data for part-time faculty are not available.

**Table 1. A comparison of the university student-to-faculty ratio in Canadian provinces in 2009/10**

Rank	Province	FTE/FTF
1	ON	25
2	QC	22
3	AB	21
4	BC	21
5	MB	20
6	NS	17
7	SK	17
8	NB	17
9	NL	16
10	PE	16

Figure 4 reveals the change in FTE student per FTF ratios in the Ontario college sector from 2002/03 to 2010/11. Over this time period, colleges experienced a student-to-faculty ratio increase of approximately 12%.

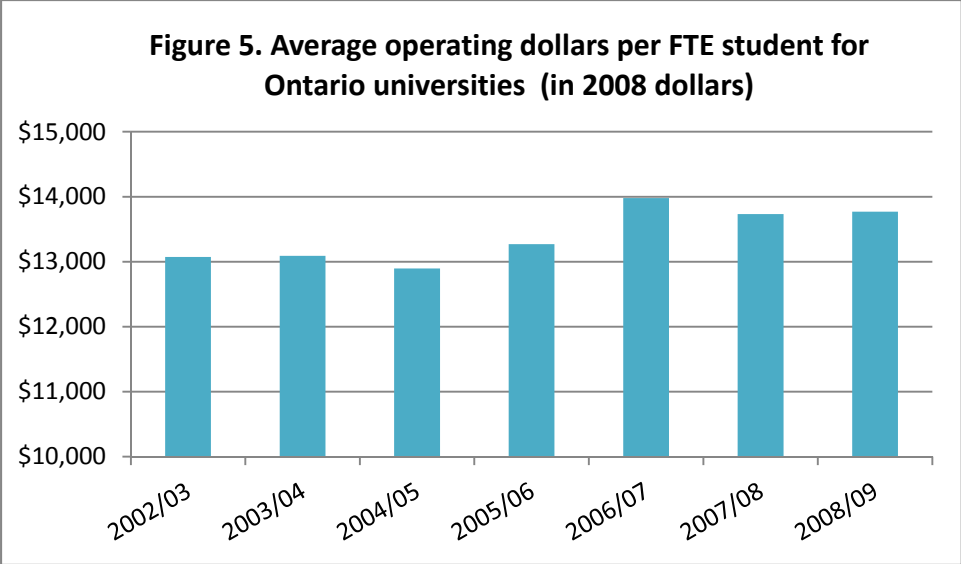


Sources: Colleges Ontario, MTCU, OCAS and College Employer Council (estimates have been made using CEC data)

Figure 5 shows the operating dollars<sup>10</sup> per student available to Ontario universities. All time series financial data in this paper are shown in real terms, adjusted to reflect constant 2008 dollars. Dollars per student has increased modestly by 5% from 2002/03 to 2008/09 (in real terms – inflation adjusted). Table 2 reveals that Ontario receives the least operating dollars per student among all provinces. For those wishing to examine funding per student over time, Appendix 3 includes a table showing the ranking of provincial operating dollars (grants and tuition) per FTE for university systems, over seven years.

<sup>10</sup>We have defined operating dollars as the sum of the two principal sources of revenues available to institutions across Canada to support their teaching and learning functions: provincial operating grants, and student tuition net of scholarship amounts. Health funding, research funding, ancillary and all other revenues are excluded.





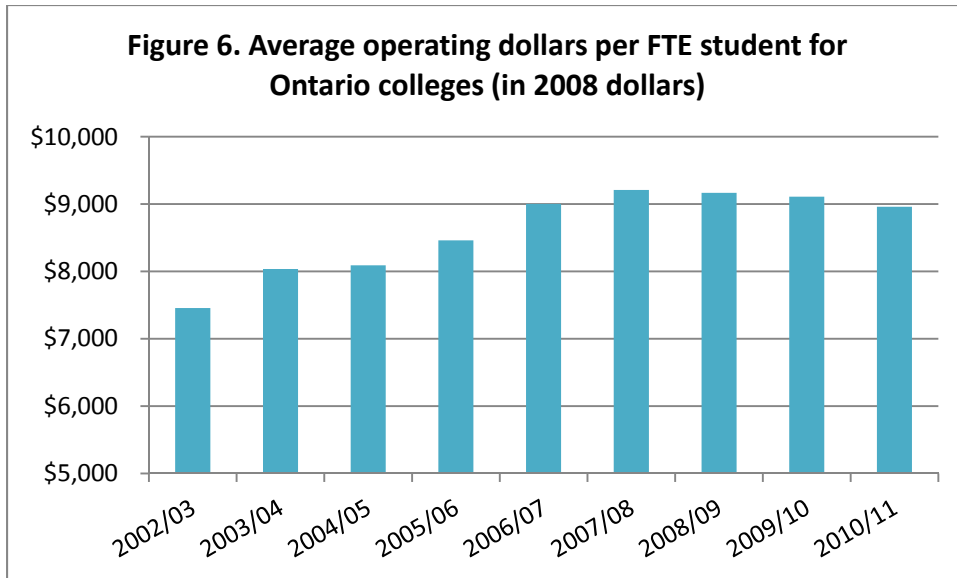
Sources: Statistics Canada, Canadian Association of University Business Officers (CAUBO) and PSIS

**Table 2. A comparison of university operating dollars per FTE student in Canadian provinces in 2008/09**

Rank	Province	Operating \$/ FTE
1	PE	\$19,368
2	AB	\$18,968
3	NL	\$18,232
4	SK	\$15,971
5	BC	\$15,660
6	NB	\$15,285
7	NS	\$14,947
8	MB	\$14,684
9	QC	\$14,099
10	ON	\$13,770
Canada		\$14,779

Figure 6 shows that inflation adjusted operating dollars per FTE student in the college sector has increased by 20% from 2002/03 to 2010/11. No robust data are available to permit a comparison of this level of funding to that of other provinces.<sup>11</sup>

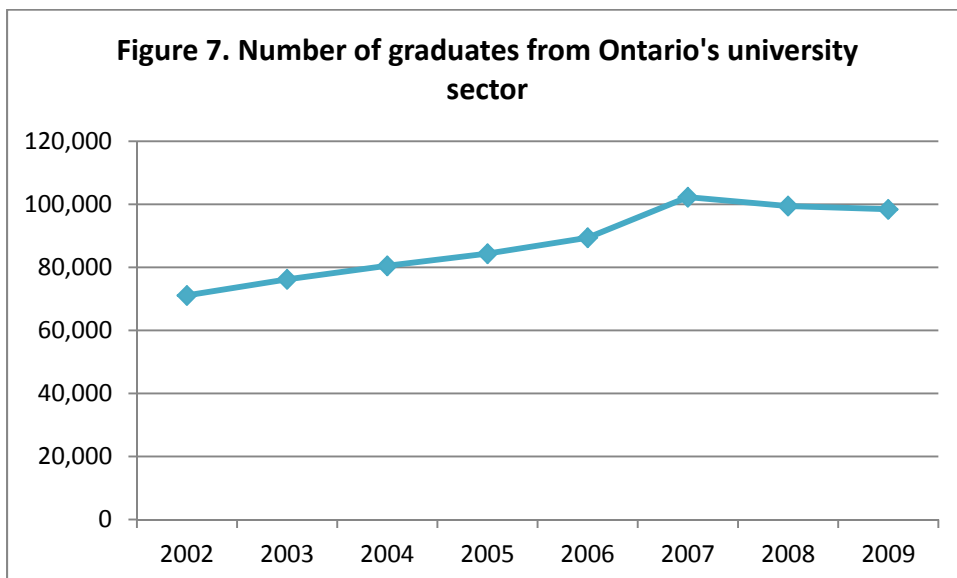
<sup>11</sup> However, Colleges Ontario, in its 2012 Environmental Scan, has conducted an informal survey of cross-Canada funding per student, suggesting that Ontario colleges are relatively efficient on this measure. [http://www.collegesontario.org/research/2012%20Environmental%20Scan/CO\\_EnvScan\\_12\\_College\\_Resources\\_WEB.pdf](http://www.collegesontario.org/research/2012%20Environmental%20Scan/CO_EnvScan_12_College_Resources_WEB.pdf)



Sources: Colleges Ontario, MTCU and OCAS

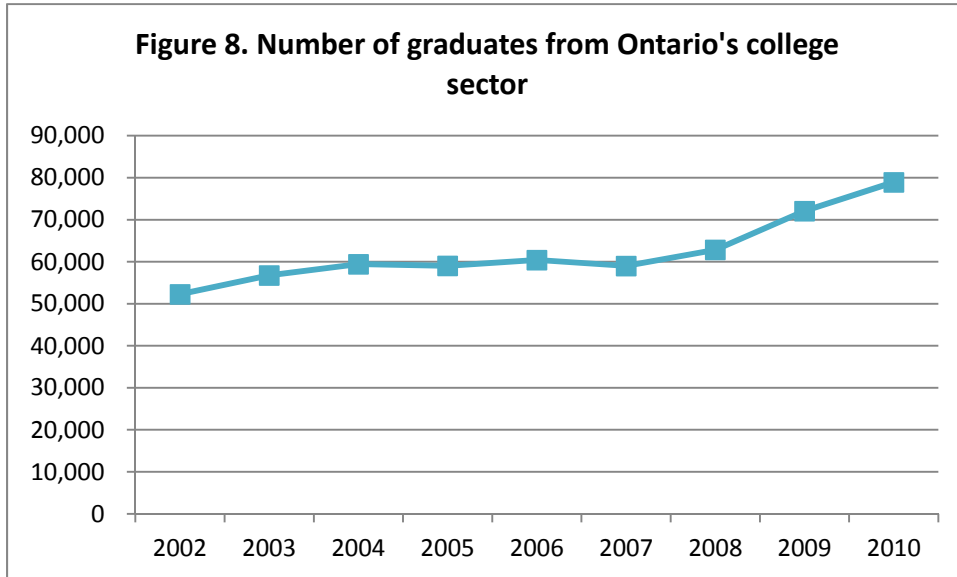
### **Graduates**

Although participating in even some postsecondary education is seen as a benefit, the number of graduates from the system is a better output measure than enrolment simply because it captures those who successfully achieved the credential they entered postsecondary studies to attain. Figure 7 shows that Ontario universities increased the number of graduates, as measured by Statistics Canada, by 38% from 2002 to 2009. (The dramatic peak and subsequent dip in university graduates at 2007 represents the graduation of the “double cohort” of 2003 high school entrants.)



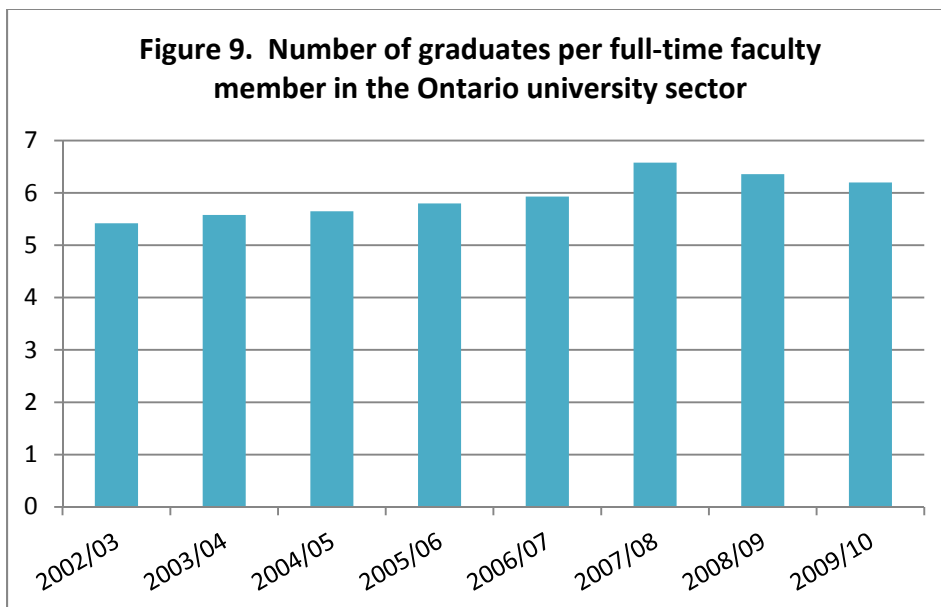
Sources: Statistics Canada, PSIS

Figure 8 shows that the number of Ontario college graduates, based on provincial administrative data, increased by 38% from 2002 to 2009, and by 51% from 2002 to 2010.



Sources: Colleges Ontario, MTCU

In terms of productivity, Figure 9 and Table 3 show that the number of university graduates per full-time faculty member has increased since 2002/03, and that Ontario is third among all provinces in Canada for producing the most graduates per faculty member.



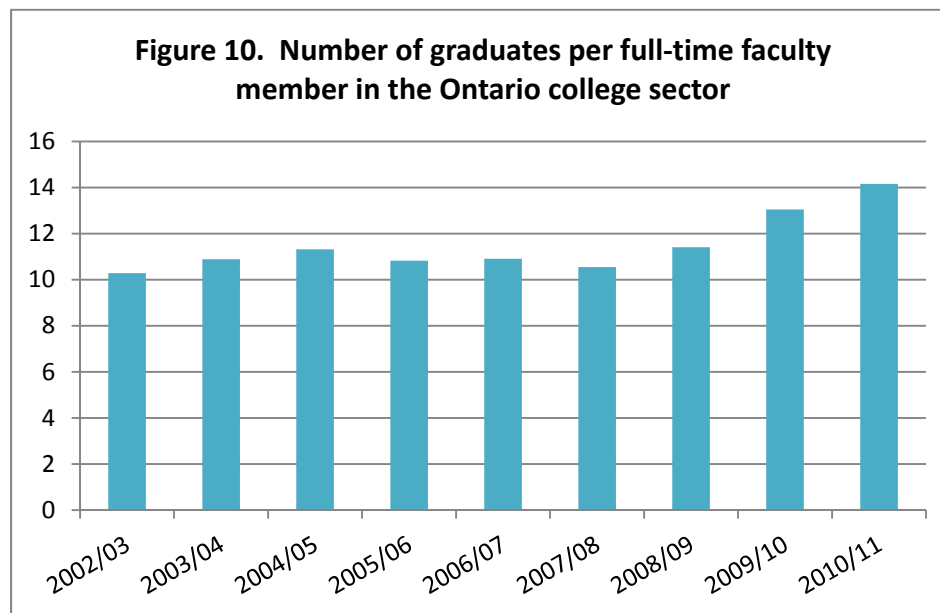
Sources: Statistics Canada, PSIS and UCASS

**Table 3. Provincial ranking of number of university graduates per full-time faculty member in 2009/10**

Rank	Province	Graduates/FTF
1	QC	7.2
2	BC	6.4
3	ON	6.2
4	NS	4.5
5	AB	4.4
6	MB	4.4
7	NB	4.2
8	SK	3.8
9	PE	3.7
10	NL	3.7
Canada		5.9

Figure 10 shows that the number of graduates per full-time faculty member in the Ontario college sector increased from about 10 to about 14 from 2002/03 to 2010/11.

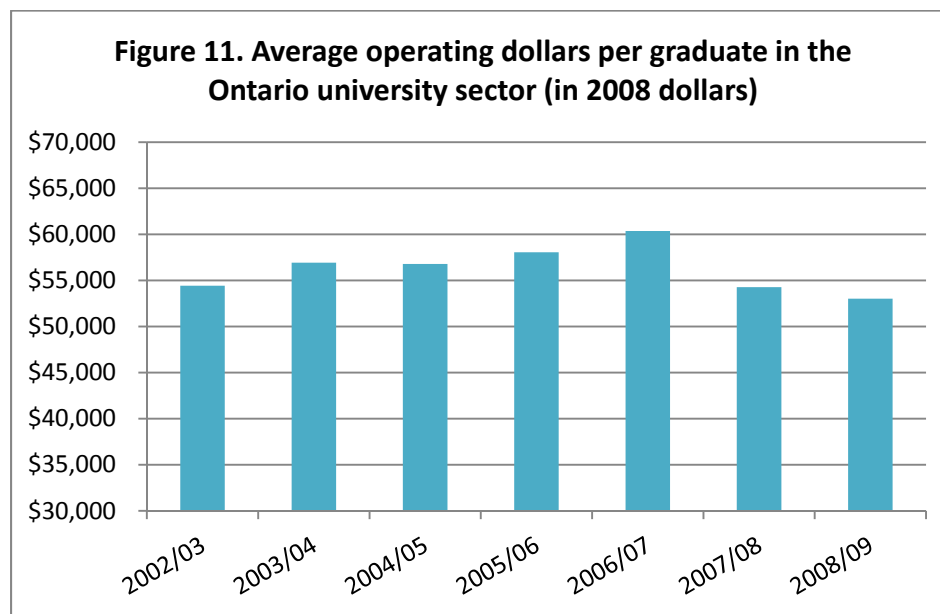
Due to data limitations, only full-time faculty are included in these analyses, and the contributions of part-time faculty are not reflected in the calculation of graduates per faculty member.



Sources: Colleges Ontario, MTCU and College Employer Council (estimates have been made using CEC data)

An “outcomes” focussed measure of fiscal productivity is that of operating dollars per successful graduate. Examination of Figure 11 and Table 4 reveals that the university sector saw almost no net

change in constant 2008 operating dollars per graduate from 2002/03 to 2008/09. Ontario ranks eighth among Canada’s 10 provinces in receiving the least funding per graduate.



Sources: Statistics Canada, CAUBO and PSIS

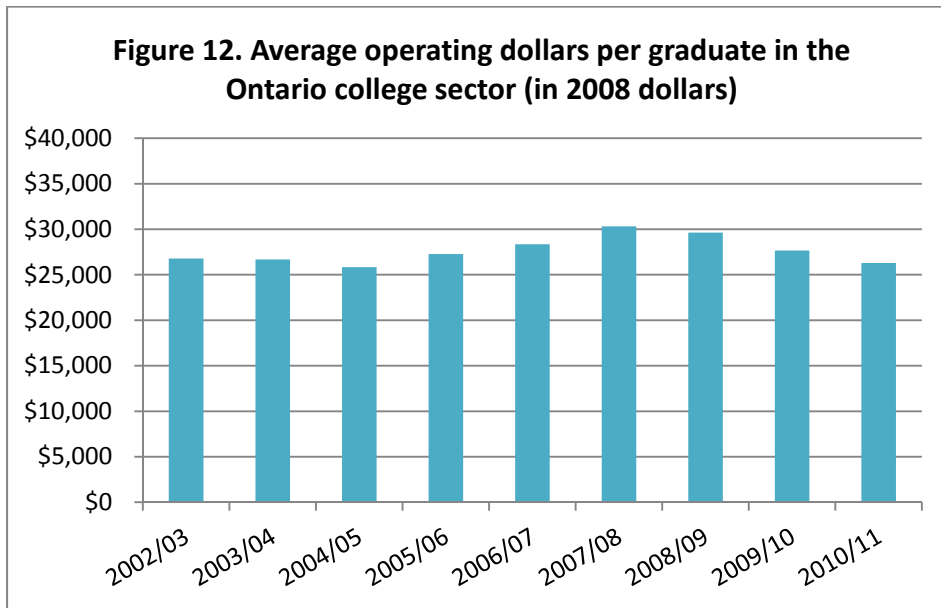
**Table 4. Provincial ranking of the average operating dollars per graduate in 2008/09 in the university sector**

Rank	Province	Operating \$/ Graduate
1	PE	\$82,357
2	NL	\$76,972
3	AB	\$74,704
4	SK	\$73,438
5	MB	\$65,691
6	BC	\$58,505
7	NB	\$57,431
8	ON	\$53,019
9	NS	\$52,988
10	QC	\$43,861
Canada		\$54,395

Figure 12 reveals that the operating funding per graduate that the college sector received in 2010/11 is 3% lower than what it received in 2002/03.

These are rough comparisons, as it was not possible to factor in differences in average program length across the country, or to meaningfully adjust for differences in annual funding levels over the multi-year time span students spent at the included institutions. Nonetheless, they represent a valuable first step

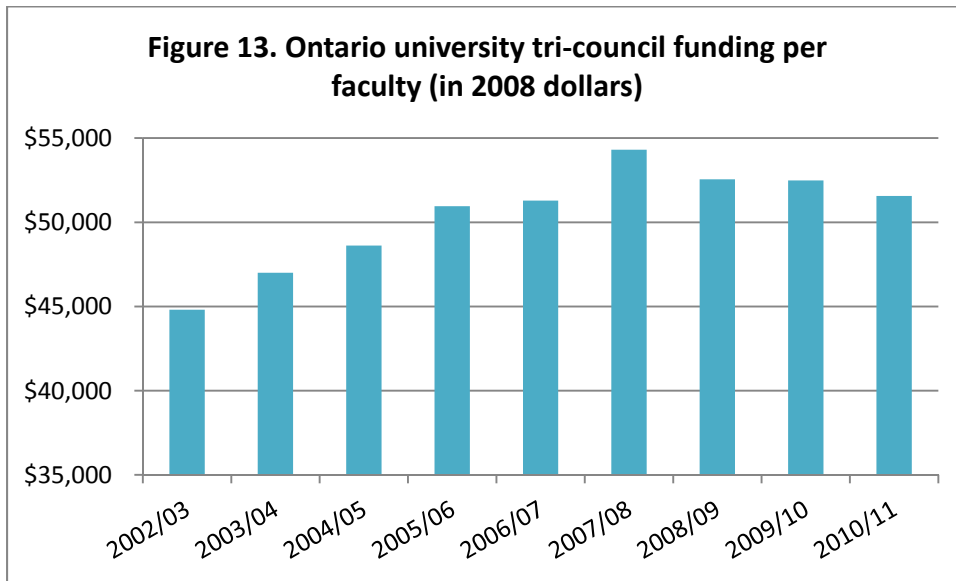
in analysing the productivity of the system from the perspective of one of its central objectives – bringing students to successful program completion.



Sources: Colleges Ontario, MTCU

## RESEARCH

Figure 13 shows that tri-council funding per faculty member in the Ontario university sector has increased by 15% from 2002/03 to 2010/11, in real (inflation adjusted) dollars. Table 5 shows that in 2010/11 Ontario ranked second only to Quebec in tri-council funding per faculty member. For completeness, Ontario ranked fourth in Canada between 2002 and 2004, third between 2005 and 2008, and second between 2009 and 2010.



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 5. 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

Source: CIHR Search Engine

Research is not a primary expectation of college faculty. However, recently, more colleges have been engaged in applied research and there have been several tri-council grant competitions targeted specifically to the college sector. Table 6 shows that in 2010/11 competitions of this kind by NSERC, Ontario colleges secured 35% of the total available funding, approximately Ontario's share of the Canadian population (38% in the 2011 Census).

**Table 6. 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, based on the 2011 Census**

Rank	Province	Share of Funding	Percentage of Canadian Population	Total Funding
1	QC	39%	24%	\$11.0M
2	ON	35%	38%	\$9.9M
3	AB	14%	11%	\$3.8M
4	BC	6%	13%	\$1.6M
5	MB	2%	4%	\$0.6M
6	NB	2%	2%	\$0.5M
7	NS	1%	3%	\$0.4M
8	NL	1%	2%	\$0.1M
9	SK	0%	3%	\$0.1M
10	PE	0%	0%	\$0
Canada		100%	100%	\$28.0M

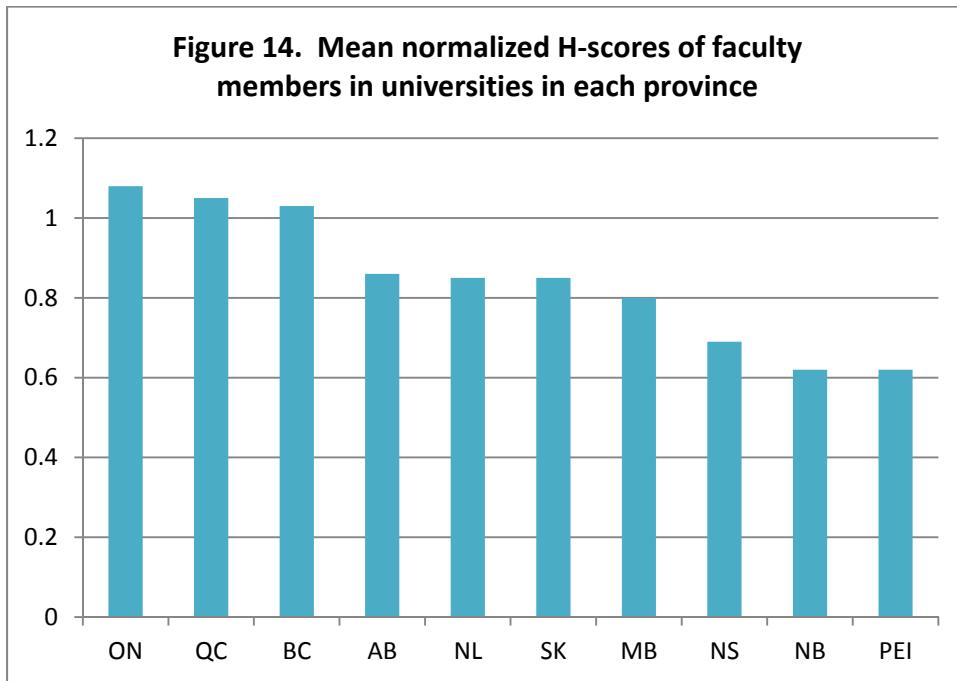
Source: CIHR Search Engine

While it is challenging to measure research productivity across postsecondary institutions, Hirsch-index scores can be used to measure the research impact and output of faculty across Canada. Hirsch-index scores, more commonly referred to as the H-index, are designed to measure both the quantity of faculty research publications and their impact as measured by the number of times these publications are cited by the Google Scholar database. Produced by Higher Education Strategy Associates, Canadian H-index scores are calculated for university faculty members who have both a research and teaching role. Faculty members from academic disciplines (not including medicine) who are professors, assistant professors, deans/associate deans, chairs/associate chairs, research chairs, lecturers, and instructors are included. The types of research publications that are included in the H-index score are: peer-reviewed articles, conference proceedings, books, and scholarly articles. The scores are then standardized to account for disciplinary differences in publication output. Appendix 4 provides a more detailed description of how H-scores were generated for Canadian faculty members and the ways in which these numbers were normalized and standardized.

Figure 14 and Table 7 present a provincial comparison of H-scores of faculty members across Canada. These data suggest that Ontario's university faculty complement has the highest research output and/or impact among all provinces. Ontario has the third lowest percentage of faculty who, by this measure, are non-productive in research as represented by an H-score of zero. Ontario also has the third highest percentage of "research stars" as demonstrated by H-scores greater than 2, where a score of 1 is the



normalized national average (that places them in the top 12% of faculty members across the country, normalized for discipline).



Source: Higher Education Strategy Associates

**Table 7. Mean normalized H-scores of faculty in universities in each province**

Rank	Province	Mean Standardized H-Score	% of faculty with a score of 0	% of faculty with a score > 2
1	ON	1.08	16%	13%
2	QC	1.05	15%	14%
3	BC	1.03	25%	14%
4	AB	0.86	28%	11%
5	NL	0.85	20%	7%
6	SK	0.85	20%	9%
7	MB	0.80	26%	9%
8	NS	0.69	30%	7%
9	NB	0.62	30%	4%
10	PEI	0.62	15%	6%
<b>Canada</b>				
		1.00	20%	12%

Source: Higher Education Strategy Associates

## FACULTY WORKLOAD

This is an area where the college data are more robust than those of universities. Table 8 shows the following information for Ontario college faculty workloads: the total average workload per week, including preparatory time, teaching, marking and complementary duties assigned; the total average teaching hours per week; and the average course load of college faculty, over two semesters. It also shows that college faculty on average teach eight courses over two semesters.<sup>12</sup>

**Table 8. College full-time faculty workload**

Ontario College Full-Time Faculty Workload	
Average Total Workload Hours per Faculty per Week	41.1
Average Total Teaching Hours per Faculty per Week	12.8
Average Course Load per Faculty per Year	7.9

Source: Ontario Ministry of Labour 2007/08 CAAT Academic Workload Survey, revised October 2010

Table 9, based on 2010/11 data compiled from a pilot study at four Ontario universities, identifies a total average university faculty teaching course load<sup>13</sup> of three and one half courses per year. Faculty who are research active, as identified by the receipt of an external grant or publication output, teach just under one course less than those who are not.<sup>14</sup> It is important to note that these data report faculty teaching hours – they do not speak to other teaching activities such as the supervision of graduate students and unassigned time with students or preparing for class, and they do not measure the time faculty spend on the research or service dimensions of their employment responsibilities.

**Table 9. University full-time faculty workload**

Ontario University Full-Time Faculty Workload – Pilot Study			
	Sciences	Humanities and Social Sciences	Total
Research Active faculty average course load per year	2.6	3.4	3.0
Non-Active faculty average course load per year	3.4	3.9	3.8
Total average course load per faculty per year	2.7	3.7	<b>3.4</b>

Source: Pilot study by four Ontario universities (Guelph, Queen’s, Wilfrid Laurier and York)

<sup>12</sup> College faculty workloads shown in Table 8 represent the combined and averaged workload of all full-time faculty at the 20 colleges surveyed, including faculty with coordinator duties (who average 10.5 teaching hours per week) and those without (who average 13.7 teaching hours per week).

<sup>13</sup> For all of the college and university faculty workload data shown in this report, a one semester course is counted as one course. So, a faculty member who teaches two courses in each of the two semesters would be counted as having a workload of four courses.

<sup>14</sup> University course load data include assigned classes, excludes graduate supervision and unassigned time with students.

## DATA GAPS

Quality measures: The most obvious data gap is the absence of an acknowledged and accepted measure of the quality of the educational experience and of system graduates. No productivity evaluation is complete without incorporating the quality element and, at this time, as noted by other reports, there is no generally accepted measure of the quality of higher education. Some tests exist that purport to measure generally acknowledged elements of quality, such as critical thinking skills, but the use and interpretation of these tests are controversial. Other proxies, such as student engagement, and graduate satisfaction surveys and employment rates, are used in a variety of jurisdictions including Ontario.

One way to address the quality issue is to pursue, in a rigorous and systematic way, the use of learning outcomes assessment. While we are encouraged by the progress Ontario has made in the articulation of learning outcomes and the development of credential frameworks, the ability to assess in valid and reliable ways whether these learning outcomes are being achieved, and at what rate and to what degree, remains a critical challenge for the Ontario system. HEQCO's research program has begun to address this issue and, in collaboration with Ontario colleges and universities, our research will extend to the investigation of processes and measures to evaluate and document achievement of learning outcomes in the Ontario system.

Graduation rates: We have reported on graduates per faculty and operating dollars per graduate, as important measures of comparative productivity. Graduation rates, measuring the proportion of students who graduate and ideally also the time it takes them to do so (time to completion), drives productivity on these measures.

We do not report on graduation rates,<sup>15</sup> because we are not convinced that the processes that are currently used to measure graduation rates give us a true picture of the flow through and transfers of students through the system and, therefore, that they provide a sufficiently complete measure of graduation rates. Many of these interpretative challenges would evaporate if the OEN were used throughout the Ontario postsecondary system. We support work underway, led by MTCU, to drive its immediate introduction across the sector. Looking further ahead, and given the significant movement of students between provinces, some form of a Canadian education number, or other mechanism to accurately track the movement of students between provinces at the individual student level, would be a logical additional step to facilitate a better understanding of the entire educational experience within Canada.

---

<sup>15</sup> We use "graduation rate" as it used by the province, to measure the percentage of starting students in a defined cohort who complete a program of study within a prescribed timeframe. We do not use it as it is defined by the OECD, to measure the postsecondary attainment rate of the adult population. We recognize that Ontario universities participate in the Consortium for Student Retention Data Exchange, which allows for cross-jurisdictional benchmarking, and that colleges in Ontario measure graduation rates using a standardized methodology provided by MTCU. However, neither of these systems is able to successfully capture the movement of students between provinces and institutions, an increasingly important component of student retention and success.

Employer surveys: The dominant reason students pursue a postsecondary education, and a primary reason for public support of higher education, is for students to receive the education and credentials they require for a good job. As such, a metric one might wish to include in a productivity assessment is graduate success in obtaining employment and the satisfaction of employers with the graduates they employ. The province currently conducts a survey of employers of fresh (six months out) college graduates. There is no equivalent on the university side. The college data are likely favourably skewed because the graduate's consent is required to contact the employer. They are nonetheless an important first step, and other approaches to measuring employer satisfaction should be examined. Broader surveying of employers, with questions that probe both the generic learning and cognitive skills and job/discipline specific competencies of graduates, could provide an important feedback loop for policy makers and educators across the system.

College data: At least with respect to some data important for productivity measures, the college sector does not appear to have as robust a reporting regime as do universities. There appear to be at least two contributing issues for this. First, the teaching mandate of colleges is quite varied and includes a significant volume of non-postsecondary activities such as academic upgrading, English-as-a-Second Language and in-school apprenticeship that do not lead to a provincial certificate, diploma or degree. Second, the source of funding for these different types of programs also varies – academic programs are typically supported by the provincial grant to the college while some non-academic programs are supported by special envelope funding. These distinctions sometimes complicate direct attribution of operating dollars, students and faculty to postsecondary activities, and calculations based on certain assumptions are often the only way of estimating the relevant numbers, and excluding the irrelevant ones. Given the diverse mandates of colleges, particularly if the range of college activities is to diversify and evolve further, we suggest that Colleges Ontario and MTCU revisit the data that would be most meaningful and capture most accurately the information needed for some of these analyses.

College data are also limited in the ability to make meaningful inter-provincial comparisons. This arises, again, because of the varied structures, missions and mandates of colleges in the different provinces. It is not within the capacity of Ontario alone to solve this problem. Universities have obviated this challenge by using Statistics Canada as the repository of cross-provincial data, and this has allowed the inter-provincial analyses in this report. A parallel infrastructure for reporting college data exists at Statistics Canada, as part of the Postsecondary Student Information System (PSIS). However, until all colleges report nationally and appropriate approaches are developed to deal with differences in provincial college systems and mandates, we will have to rely, as we do in this paper, on analyses of changes over years in some measures within the Ontario college system.

Faculty workload data in the university sector: Faculty workload is an area where college data are superior to those of universities. This results, no doubt, because of the importance of these data in pan-provincial collective bargaining. The university faculty workload data presented in this paper are some of the first attempts to capture and present these data at a university sector level.

We applaud the four participating Ontario universities for the pilot faculty workload study. Although the data are likely a reasonable estimate of the actual teaching loads of the entire system, the data are tentative until a larger sample of universities is included. We understand that more universities in Ontario have agreed to provide faculty workload data. It seems reasonable to us that this reporting requirement be extended to all Ontario universities to ensure that we have a complete understanding and appreciation of these data. We will also need more comprehensive reporting of all of the elements of faculty workloads including an analysis of workload by rank and type of appointment, appropriate recognition for administrative duties assigned to faculty that may reduce their teaching load, and the ability to measure the proportion of the institutional teaching load carried by part-time and sessional employees. Lastly, a complete understanding of faculty workload must speak to the time faculty spend on their research and service responsibilities.

**Appendix 1. Select bibliography of interesting reading about defining and measuring productivity in higher education**

Entrepreneurship in Higher Education Retreat. (2011). *College 2.0: An Entrepreneurial Approach to Reforming Higher Education: Overcoming Barriers and Fostering Innovation*.  
[http://www.kauffman.org/uploadedFiles/entrepreneurial\\_approach\\_to\\_higher\\_ed\\_reform.pdf](http://www.kauffman.org/uploadedFiles/entrepreneurial_approach_to_higher_ed_reform.pdf)

Lumina Foundation Focus. (2012). *College, Rewired: Innovative approaches help higher education connect to productivity*.  
<http://focus.luminafoundation.org/summer2012/>

Lumina National Productivity Conference. (2010). *Navigating the "New Normal"*.  
[http://www.luminafoundation.org/publications/Navigating\\_the\\_new\\_normal.pdf](http://www.luminafoundation.org/publications/Navigating_the_new_normal.pdf)

Middaugh, M.F. (2002). *A Consortial Approach to Assessing Instructional Expenditures' or Presentation: 'You've Got Questions We've Got Answers -- The National Study of Instructional Costs and Productivity'*.  
<http://www.udel.edu/IR/cost/>

Musick, M.A. (2011). *An Analysis of Faculty Instructional and Grant-based Productivity at The University of Texas at Austin*.  
[http://www.utexas.edu/news/attach/2011/campus/32385\\_faculty\\_productivity.pdf](http://www.utexas.edu/news/attach/2011/campus/32385_faculty_productivity.pdf)

National Research Council. (2012). *Improving Measurement of Productivity in Higher Education. Panel on Measuring Education Productivity: Conceptual Framework and Data Needs*. Teresa A. Sullivan, Christopher Mackie, William F. Massy and Esha Sinha, eds. Committee on National Statistics and Board on Testing and Assessment, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.  
[http://www.nap.edu/catalog.php?record\\_id=13417](http://www.nap.edu/catalog.php?record_id=13417)

Vedder, R., Matgouranis, C., Robe, J. (2011). *Faculty Productivity and Costs at The University of Texas at Austin: A Preliminary Analysis*. Center for College Affordability and Productivity.  
[http://www.centerforcollegeaffordability.org/uploads/Faculty\\_Productivity\\_UT-Austin\\_report.pdf](http://www.centerforcollegeaffordability.org/uploads/Faculty_Productivity_UT-Austin_report.pdf)

## Appendix 2. List of Panel members and their affiliations

Paddy Buckley, Ministry of Training, Colleges and Universities  
Glenn Craney, Council of Ontario Universities, York University  
Lindsay DeClou, Higher Education Quality Council of Ontario  
Fiona Deller, Higher Education Quality Council of Ontario  
Rani Dhaliwal, Colleges Ontario, Humber College  
Peter Gooch, Council of Ontario Universities  
Alan Harrison, Council of Ontario Universities, Queen's University  
Martin Hicks, Ministry of Training, Colleges and Universities (Chris Monahan came to the first meeting and Martin to the second)  
Steve Hudson, Colleges Ontario, Niagara College  
Ruth MacKay, Colleges Ontario, Humber College  
Maureen Mancuso, Council of Ontario Universities, University of Guelph  
Barry McCartan, Ministry of Training, Colleges and Universities  
Chris Monahan, Ministry of Training, Colleges and Universities  
Bonnie Patterson, Council of Ontario Universities  
Andy Potter, Deloitte  
Adel Sedra, Council of Ontario Universities, University of Waterloo  
Bill Summers, Colleges Ontario  
Ema Thurairajah, Deloitte  
Harvey Weingarten, Higher Education Quality Council of Ontario

### Appendix 3. Explanatory notes for figures and tables

#### **Figure 1. Re: full-time equivalent (FTE) student enrolments in the Ontario university sector**

- 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, the definition of full-time and part-time has changed. The registration status for enrolments as of 2008/09 refers to the September to December period. In the previous years, it referred to the September to April period.
  - 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 2. Re: full-time equivalent (FTE) student enrolments in the Ontario college sector**

Subset of Category “Full System FTE” (all reported college activity, including apprenticeship, academic upgrading, nursing, and other unfunded activity). Postsecondary funded FTEs and international headcount for all three semesters converted to FTEs. Due to missing data, international FTEs for 2001/02 and 2002/03 are projections based on the average per cent change from 2003/04 to 2005/06.

#### **Figure 3 and Table 1. Re: The average number of FTE students per full-time faculty member in the Ontario university sector**

- All
  - PSIS data represent program counts and not headcounts leaving the possibility for double counting if students are enrolled in more than one program.
  - FTEs are calculated for institutions included in both PSIS and UCASS.
  - The same provincial notes from FTEs apply.
- UCASS includes only full-time faculty and the ratio of full- to part-time faculty varies by institution. Thus, the estimates provided for the number of FTEs per FTF are not a comprehensive reflection of FTEs per faculty.



**Figure 4. Re: The average number of FTE students per full-time faculty member in the Ontario college sector**

- Subset of Category “Full System FTE” (all reported college activity, including apprenticeship, academic upgrading, nursing, and other unfunded activity). Postsecondary funded FTEs and international headcount for all three semesters converted to FTEs. Due to missing data, international FTEs for 2001/02 and 2002/03 are projections based on the average per cent change from 2003/04 to 2005/06.
- Full-time faculty refer to funded faculty and exclude librarians and counsellors. Estimates the ratio of postsecondary and international FTEs to full FTEs is calculated for each year (approximately .83) and then applied to category 5 (Faculty). Prior to 2005/06 it is based on the average ratio from 2005/06 to 2010/11 due to missing data.

**Figure 5 and Table 2. Re: Average operating dollars per FTE student for Ontario universities (in 2008 dollars)**

- PSIS data represent program counts and not headcounts leaving the possibility for double counting if students are enrolled in more than one program.
- FTEs are calculated for institutions included in both PSIS and CAUBO.
- The same provincial notes from FTEs apply.
- Dollars are expressed as constant 2008 dollars, using Statistics Canada Consumer Price Index data.
- Provincial rank (in descending order) of operating funding (grants plus tuition) over seven years is provided below for additional information:

**Provincial ranking of operating \$ / FTE over time**

Province	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
NL	5	4	4	4	3	3	3
PE	1	1	1	1	1	1	1
NS	10	10	9	8	9	8	7
NB	7	7	8	6	6	6	6
QC	6	6	7	10	10	10	9
ON	8	9	10	9	8	9	10
MB	2	5	6	7	7	7	8
SK	9	8	5	5	5	5	4
AB	3	2	2	3	2	2	2
BC	4	3	3	2	4	4	5

**Figure 6. Re: Average operating dollars per FTE student for Ontario colleges (in 2008 dollars)**

- Subset of Category “Full System FTE” (all reported college activity, including apprenticeship, academic upgrading, nursing, and other unfunded activity). Postsecondary funded FTEs and international headcount for all three semesters converted to FTEs. Due to missing data, international FTEs for 2001/02 and 2002/03 are projections based on the average per cent change from 2003/04 to 2005/06.

- Operating dollars: MTCU college funding allocation and domestic tuition and international tuition.

**Figure 7. Re: Number of graduates from Ontario’s university sector**

- The same provincial notes from FTEs apply.
- Graduates are calculated by calendar year, not academic.

**Figure 8. Re: Number of graduates from Ontario’s college sector**

- Graduates, including international students, from funded PSE programs. Graduation year, not reporting year.

**Table 3 and Figure 9. Re: Number of graduates per full-time faculty member in the Ontario university sector**

- Data has not been time shifted.
- Graduates are calculated by calendar year and UCASS data are for the academic year.
- Graduates are calculated for institutions included in both PSIS and UCASS.
- UCASS includes only full-time faculty, and the ratio of full- to part-time faculty varies by institution. Thus, the estimates provided for the number of graduates per FTF are not a comprehensive reflection of graduates per all faculty teaching at institutions.
- The same provincial notes from FTEs apply.
- 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.

**Figure 10. Re: Number of graduates per full-time faculty member in the Ontario college sector**

- Graduates, including international students, from funded PSE programs. Graduation year, not reporting year.
- Full-time faculty refer to funded faculty and exclude librarians and counsellors. Estimates; the ratio of postsecondary and international FTEs to full FTEs is calculated for each year (approximately .83) and then applied to category 5 (Faculty). Prior to 2005/06 it is based on the average ratio from 2005/06 to 2010/11 due to missing data.

**Figure 11 and Table 4. Re: Operating dollars per graduate in the university sector (in 2008 dollars)**

- Graduates are calculated for institutions included in both PSIS and CAUBO.
- The same provincial notes from FTEs 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 12. Re: Operating dollars per graduate in the Ontario college sector (in 2008 dollars)**

- 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.

**Table 6. Re: Provincial ranking of share of funding in college-targeted NSERC grant competitions**

- A total of grants provided by the Natural Sciences and Engineering Research Council of Canada: Applied Research and Development, Applied Research Tools and Instrument, College-University Idea to Innovation, Industrial Research Chairs for Colleges, Innovation Enhancement and Technology Access Centre.

**Figure 14 and Table 7. Re: Mean normalized H-scores of faculty members in universities in each province**

- See Appendix 4

**Table 8. Re: College Full-Time Faculty Workload**

- College full-time faculty workload parameters are prescribed in a province-wide collective agreement, and documented on a “standard workload form” used by all colleges. Data presented here are from a 2007/08 survey by the Ontario Ministry of Labour, updated in 2010, in which 20 of the 24 colleges participated. The data is still relevant today, as the workload provisions in the collective agreement have not been materially amended in subsequent rounds of bargaining. In addition to student contact (classroom teaching) parameters, the collective agreement sets out parameters for assigning preparation, marking, and non-teaching duties.

**Table 9. University full-time faculty workload**

- Pilot data from 2010/11. Includes the workloads of all faculty members who have some expectation of teaching.
- Research intensiveness identified by evidence of research contracts and grants, and other research activity such as book publishing, publication record, creative activities, editing a journal or presenting at a peer adjudicated conference. The universities in the pilot study were not able to develop a comprehensive measure of the research activity of faculty. The measures used in the pilot study may underrepresent the number of faculty actively engaged in research.
- The data in Table 9 include only assigned classes. University faculty are engaged in other

teaching activities not captured – most notably, the supervision and training of graduate students and unassigned teaching of undergraduates (including supervision of undergraduate research projects and student advising), and development of curriculum and learning outcomes.

- The workload of university faculty relating to research and service to the university and the community are also not captured in the workload data presented.

#### Appendix 4. Description of H-scores

Hirsch-index scores, more commonly referred to as the H-index, are designed to measure both the quantity of faculty research publications and their impact as measured by the number of times these publications are cited by the Google Scholar database. Produced by Higher Education Strategy Associates, H-index scores are calculated for faculty members who have both a research and teaching role. Faculty members from academic disciplines (not including medicine) who are professors, assistant professors, deans/associate deans, chairs/associate chairs, research chairs, lecturers, and instructors are included. The types of research publications that are included in the H-index score are: peer-reviewed articles, conference proceedings, books, and scholarly articles. The scores are then standardized to account for disciplinary differences in publication output.

**Mean Standardized Score:** Every academic in the HiBAR database is given a standardized score, which is simply their own H-index score divided by the national average H-index score for that discipline. These normalized scores are then averaged across all academics at a given institution. A score above 1 means that the average academic at an institution has a higher h-index score than the national average.

**%>2%:** This represents the fraction of the academic staff with an H-index score more than twice the average for their discipline, which is a very rough way of measuring researchers who could be considered as “highly-cited” or “expert.”

**%=0:** This represents the fraction of the academic staff with no published, cited papers in the Google Scholar database.