



Higher Education
Quality Council
of Ontario

An agency of the Government of Ontario

@ Issue Paper No. 7

Informing policy through analysis of current research

Expanding Opportunities for Graduate Studies: The Recent Experience of Ontario

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April 12, 2011

Published by:

The Higher Education Quality Council of Ontario

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Cite this publication in the following format:

Wiggers, R., Lennon, M.C., Frank, K. (2011). *Expanding Opportunities for Graduate Studies: The Recent Experience of Ontario*. Toronto: Higher Education Quality Council of Ontario.



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*Special thanks to Higher Education Quality Council of Ontario (HEQCO) colleagues
Sylvia Lin, Angelika Kerr and Louise Winberg for their assistance in the early
development of this research project.*

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Introduction

Graduate degrees are credentials that individuals, employers and governments hold in increasingly high esteem.

For the individual, graduate-level credentials hold the promise of increased employment opportunities, income, satisfaction and stability (Council of Ontario Universities, 2003). As the skill requirements for many occupations rise, a graduate degree suggests higher levels of knowledge and skills. That may explain why, in a recent survey of Ontario university students about to complete their first undergraduate degree, nearly two-thirds indicated that they planned to pursue an additional credential, three-quarters within the first year after graduation (OUSA, unpublished).

A highly educated and qualified citizenry also offers more general benefits. It can support innovation in our increasingly knowledge-based economy (David & Forney, 2003: 22), as well as overall creativity and entrepreneurship (Florida, 2002). Individuals holding graduate-level credentials are more likely to possess the social and cultural capital that will allow them to absorb and interpret knowledge and information in order to successfully engage in the labour market (Engelbrecht, 2003).

Governments have been encouraging increased access to graduate degrees in various ways. While the federal government has focused on expanding the offerings of individual grants and scholarships for study and research, especially through the Tri-Council (CIHR, NSERC, SSHRC), provinces such as Ontario have also directed funding at universities to increase the number of graduate spaces being offered each year.

Universities obviously also play a significant role in any expansion of graduate education. Universities may be responding to student demand both in terms of the number of spaces offered (e.g., increased demand resulting from the double cohort in Ontario) and in terms of the types of programs being offered. Graduate students may also be seen as a source of support for both the undergraduate teaching and the research missions of universities, as discussed in the recent book *Academic Transformation*:

The desire of every university to participate in meeting the need for knowledge creation has been most vividly mirrored in the universities' response to opportunities to increase enrolments in master's and doctoral programs. Indeed, the creation of highly-qualified personnel, in the form of graduates with an advanced understanding of research methods and the capacity to undertake research and apply it, is an integral part of a university research program. (Clark et al., 2009: 61)

The aim of this paper is to explore enrolment growth in Ontario graduate programs between 1999–00 and 2008–09. It provides an overview of some of the changes in the Ontario graduate education system that have taken place in recent years through an

examination of trends in terms of enrolment, demographics, fields of study and the development of new programs. Finally, ideas for further research are also explored.

The Policy Context

Just before he assumed his new responsibilities as Canada's 28th Governor General, David Johnston was president of the University of Waterloo and a member of the Coalition for Action on Innovation in Canada. In their *Action Plan* published in October 2010, which Governor General Johnston strongly endorsed, the Coalition made a number of recommendations designed to position Canada as a world leader in innovation: one recommendation was to increase per capita graduation rates at the master's and PhD levels (Coalition for Action on Innovation in Canada, 2010). A month later, Ontario's Task Force on Competitiveness, Productivity and Economic Progress published its ninth annual report. The Task Force recommended that Ontario focus on increasing the number of master's degrees attained, particularly in fields involving business and management skills (Task Force on Competitiveness, Productivity and Economic Progress, 2010: 52).

These recent calls to expand graduate enrolments and credentials are simply the latest in nearly a decade of efforts at both the national and the provincial levels. The federal government sought expanded graduate enrolments as part of their national Innovation Strategy, launched on February 12, 2002. Discussion papers released by Industry Canada and Human Resources and Skills Development Canada (HRSDC) — in advance of a year-long consultation process — explained that Canada needed to “develop, attract and retain the highly qualified people required to commercialize and adopt leading-edge innovations” (Industry Canada, 2001: 60). It was also believed at the time that Canada's universities were “facing an unprecedented loss of teachers and researchers due to retirements” which was expected to continue over the next decade (Industry Canada, 2001: 56).

To deal with these dual challenges of growing demand and limited supply, the federal government called upon Canadian universities to “increase the admission of Master's and Doctoral students at Canadian universities by an average of 5 percent per year” through to 2010. In support of these efforts, it also promised to “double the number of Master's and Doctoral fellowships and scholarships awarded by the federal granting councils” (Industry Canada, 2001: 60).¹

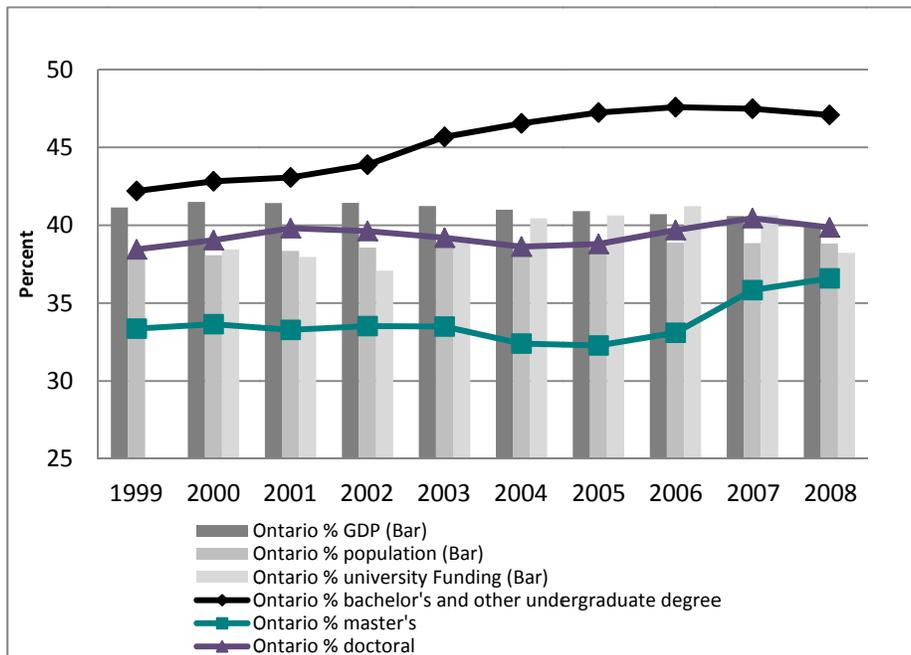
Within Ontario, the impetus for graduate enrolment expansion was reinforced in 2005 by the release of the “Rae Review.” Rae was guided by the same two core assumptions of the previous federal documents, stating that “Ontario is facing a faculty shortage due to retirements, and the province needs to close the productivity gap with competing jurisdictions” (Rae, 2005: 87). An additional rationale was provided by Ontario's double-cohort students: they entered university undergraduate programs in

¹ As promised, federal funding for the granting councils — CIHR, NSERC and SSHRC — nearly tripled after 2002, while the number of scholarships available for graduate study doubled, including the creation of a new Canada Graduate Scholarship (CGS) program for researchers at the master's and doctoral level.

huge numbers in the fall of 2003, and would soon be seeking opportunities for graduate credentials as well. To meet these demands, Rae recommended that the province “double the number of graduate students in Ontario to approximately 60,000 over ten years” (Rae, 2005: 87).

Another factor supporting expanding graduate enrolments was data that suggested Ontario universities were not training an appropriate share of postgraduates. While most measures would place Ontario’s share of the national total at approximately 40 per cent — GDP, population, university funding, and even undergraduate and doctoral enrolments — as of the 2005 Rae Review, Ontario was educating less than 33 per cent of the nation’s master’s students (Chart 1).

Chart 1: Ontario as a Percentage of the National Total (1999–00 to 2008–09)



Source: Ontario GDP and population data from Statistics Canada; Ontario university funding data from Canadian Association of University Business Officers; degree data from PSIS

In response to the Rae Review, the provincial government’s *Reaching Higher* strategy for postsecondary education announced that the province would “substantially expand graduate education by 12,000 students in 2007–08 and 14,000 by 2009–10 through new investments of \$220 million annually by 2009–10” (Government of Ontario, 2005).² Subsequently, the provincial government announced an additional increase of 1,300

² These targets were based on calculations of full-time equivalent (FTE) enrolments. Note as well that the total planned increase in the *Reaching Higher* plan was 14,000, and not 14,000 in addition to the original 12,000.

new spaces to be phased in by 2011–12. More recently, it also increased overall funding for the Ontario Graduate Scholarship (OGS) program to support as many as 3,000 students each year, a substantial increase from the total level of 2,000 (Government of Ontario, 2010).

Table 1: Ontario Funding for Graduate Education

	2006–07	2007–08	2008–09	2009–10	2010–11	2011–12
Graduate Enrolment Expansion (\$'000)	\$70,000	\$170,000	\$170,000	\$187,200	\$204,400	\$221,600
Ontario Graduate Scholarship ³ (\$'000)	\$15,066	\$19,807	\$23,626	\$19,657	n/a	n/a
Ontario Graduate Scholarship (Awards)	1,933	1,989	1,954	1,962	n/a	n/a

Source: MTCU

Research Approach

What ultimately matters to individuals, the labour force and society as a whole is the successful completion of graduate degrees rather than the number of attempts made to pursue graduate level degrees. Recent federal and provincial policies and targets, however, have tended to focus on increasing admission and enrolment numbers rather than on completion and graduation rates and trends. For that reason, this “At Issue” paper will examine enrolment rather than graduation measures, focusing on enrolments in master’s and doctoral programs in Ontario universities between 1999–00 and 2008–09.

More specifically, this paper will examine three primary areas of interest:

1. To what extent have enrolments grown in master’s and doctoral degree programs in Ontario? How does Ontario’s graduate enrolment growth compare with that taking place across the rest of Canada?
2. Have the demographic characteristics of graduate students in Ontario changed in recent years? How do the demographic characteristics of Ontario graduate students compare with those in the rest of Canada?
3. How has the increase in graduate enrolments impacted individual Ontario universities, as well as offerings of various academic programs and fields of study?

In order to explore these questions, three data sources are used. Data from the 2006 Census is briefly examined to provide overall measures of various degree holders in the Ontario population. Postsecondary Student Information System (PSIS) data is the primary source of data on current enrolments, and the Ontario Council on Graduate Studies data on new programs is also briefly explored.

³ The number of OGS scholarships and the funding totals vary year by year, and may not reach the maximum set aside for the program due to some awards being for two semesters rather than three, and student withdrawals.

Because this “At Issue” paper seeks to compare enrolment trends in Ontario with those elsewhere in the country, the decision was made to utilize data derived from Statistics Canada’s Postsecondary Student Information System (PSIS).⁴ The PSIS uses data that is reported annually either directly by institutions or indirectly by co-ordinating organizations reporting on their behalf (the Ministry of Training, Colleges and Universities in the case of Ontario universities). PSIS data aims at providing a complete picture of academic activity over a full twelve-month period, and measures enrolments as full-time and part-time head counts rather than full-time equivalent (FTE) calculations (Statistics Canada, 2010b).⁵ The PSIS data also includes international students.

For the purposes of this paper, a “graduate student” is defined as an individual who has enrolled in a master’s or doctoral degree program. This definition includes those students enrolled in Master of Business Administration (MBA) programs as these programs are considered to be graduate programs by the Ontario Council on Graduate Studies (OCGS). In addition, MBAs are included in the master’s degree counts provided by Statistics Canada in PSIS data.

Although MBAs are included in the enrolment counts, several other categories are not. The “other graduate level” category provided in the PSIS data is excluded from the analysis undertaken for this paper and includes the following:

- Master’s qualifying year, PhD qualifying year or probationary
- University graduate-level certificate or diploma
- Internship (postgraduate medical education, known as post-MD)
- Residency (medical, dental, veterinary)

Existing Credentials

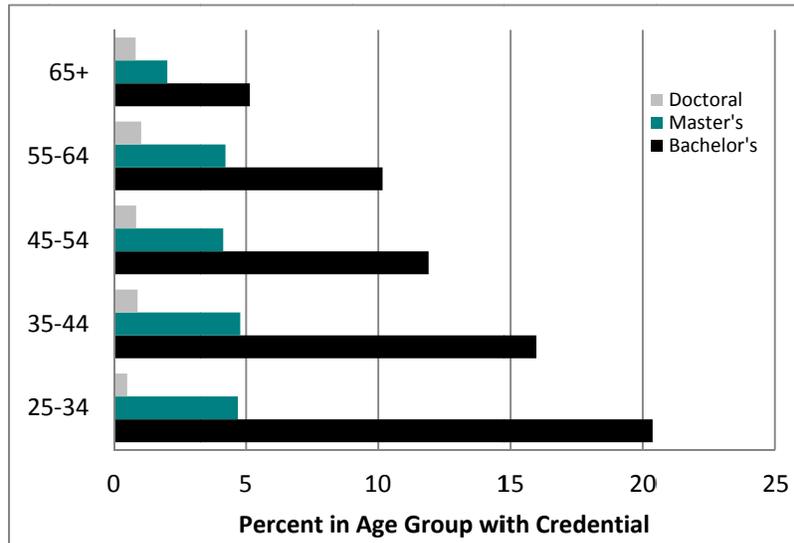
The 2006 Census indicated that slightly more than 60 per cent of adult Canadians of working age (25–64) had some type of PSE credential. From this overall percentage, only 4.8 per cent held credentials at the master’s level and only 0.8 per cent at the doctoral level. Chart 2 shows that while a relatively small percentage (5.1 per cent) of the eldest age group (65+) held an undergraduate degree, slightly more than 20 per cent of individuals between the ages of 25 and 34 held a bachelor’s degree; this represents a marked shift toward higher levels of educational attainment among the younger population. However, generational differences in graduate level attainment are much less significant across age groups. In particular, there is very little variation in the percentage of doctoral degree holders, ranging from about 0.5 per cent of those aged

⁴ The start date for each year of PSIS data reported is “the day after the end of the institution’s previous winter term, which is usually a date in April, May, or June. The reference period is one year from this start date” (Statistics Canada, 2010a).

⁵ Most enrolment and graduation statistics reported by the MTCU and the Council of Ontario Universities (COU) for Ontario universities — and by HEQCO on its new web-based Compendium of PSE Data — employ FTE measures rather than head counts.

25–34 to 1 per cent of individuals aged 55–64. Large numbers of highly educated immigrants to Canada, especially in Ontario, is one factor that might explain the higher number of graduate credentials among the older populations.

Chart 2: University Credentials in the Canadian Population

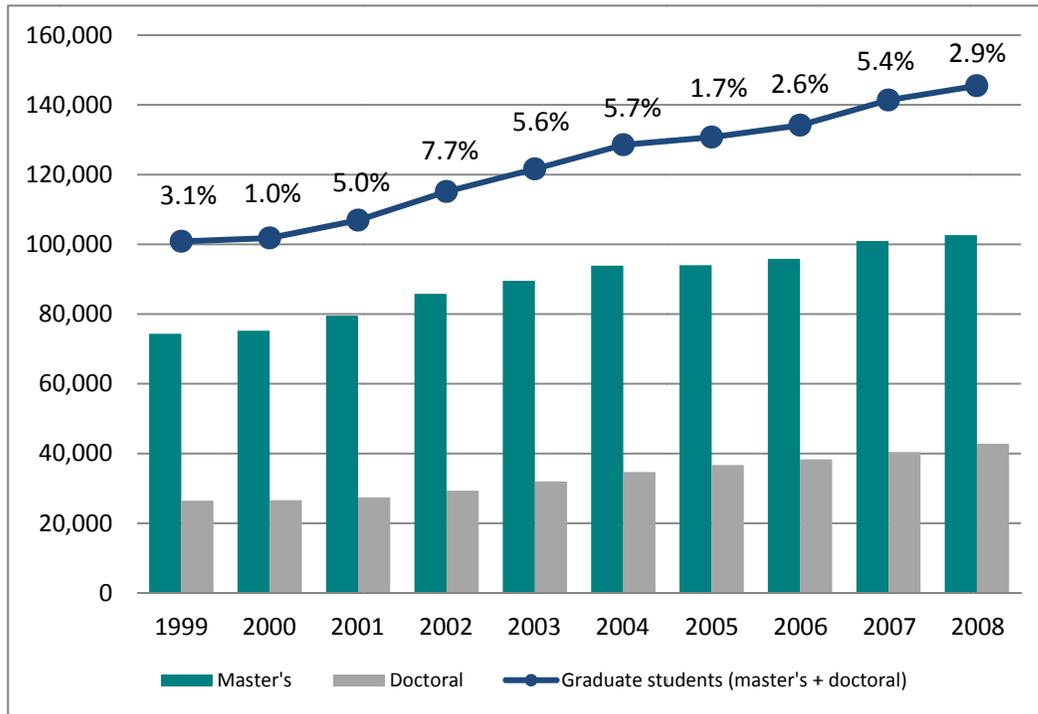


Source: Statistics Canada, 2006 Census

Similar trends for the Census data are seen in Ontario, where about 21 per cent of individuals in the 25–34 age range held bachelor’s degrees in 2006. While there are no significant differences between Ontario and Canada in terms of credentials across age groups, in 2006 the province had a slightly higher percentage of master’s degree holders in the 25–34 and 35–44 age groups than at the national level.

As a result of federal efforts, as well as new initiatives by provincial governments in Ontario and elsewhere, graduate enrolments have expanded nationally by 44 per cent between 1999–00 and 2008–09 (61 per cent for doctoral and 38 per cent for master’s study). However, after an initial surge from 2001 to 2004, the annual pace of growth across Canada rarely met the 5 per cent target called for in the federal *Innovation Strategy* (Chart 3).

Chart 3: Graduate Enrolment Growth, Canada (1999–00 to 2008–09)

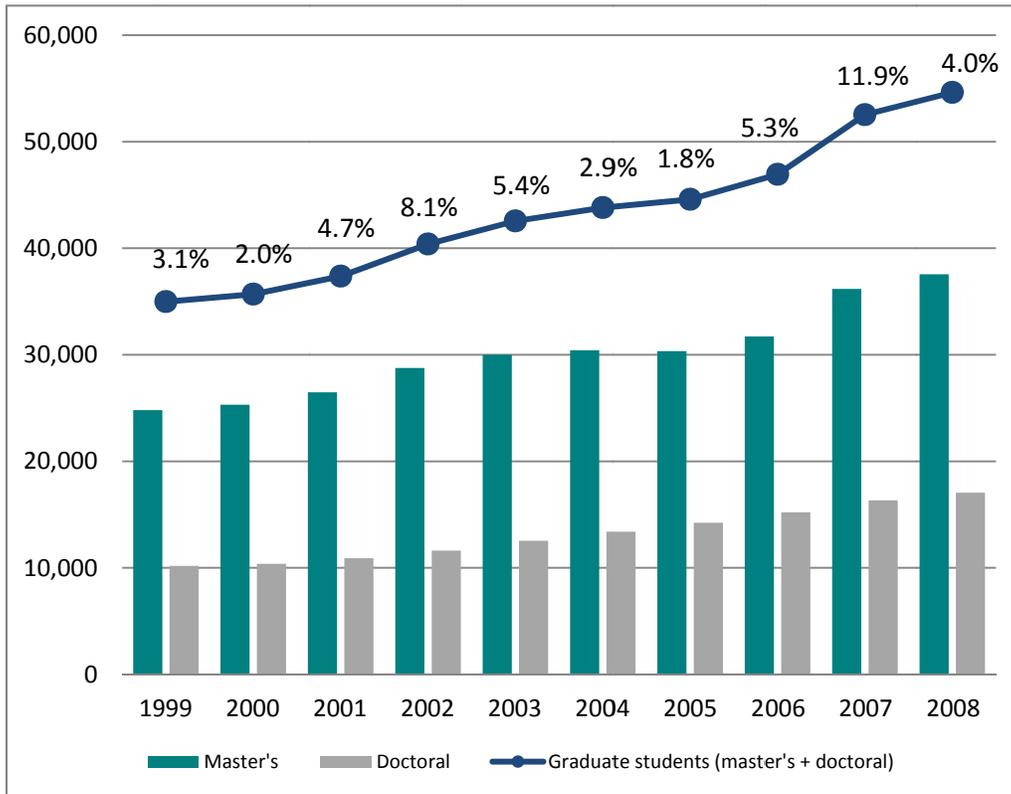


Source: Statistics Canada, PSIS

Note: Percentages represent annual growth rates for graduate student enrolments (master's + doctoral)

The national increase in the years 2006 through 2008 was fuelled in large part by the substantial expansion of graduate enrolments undertaken by Ontario universities. More specifically, Chart 4 illustrates the impact of Ontario's double cohort entering master's degree programs in increased numbers in 2007. Between the 1999–00 and 2008–09 academic years, Ontario's master's and doctoral degree enrolments grew even more substantially than at the national level, with rates of 51 per cent and 67 per cent respectively (versus 38 per cent and 61 per cent nationally).

Chart 4: Graduate Enrolment Growth, Ontario Universities (1999–00 to 2008–09)



Source: Statistics Canada, PSIS
 Note: Percentages represent annual growth rates for graduate student enrolments (master's + doctoral)

Demographic Trends

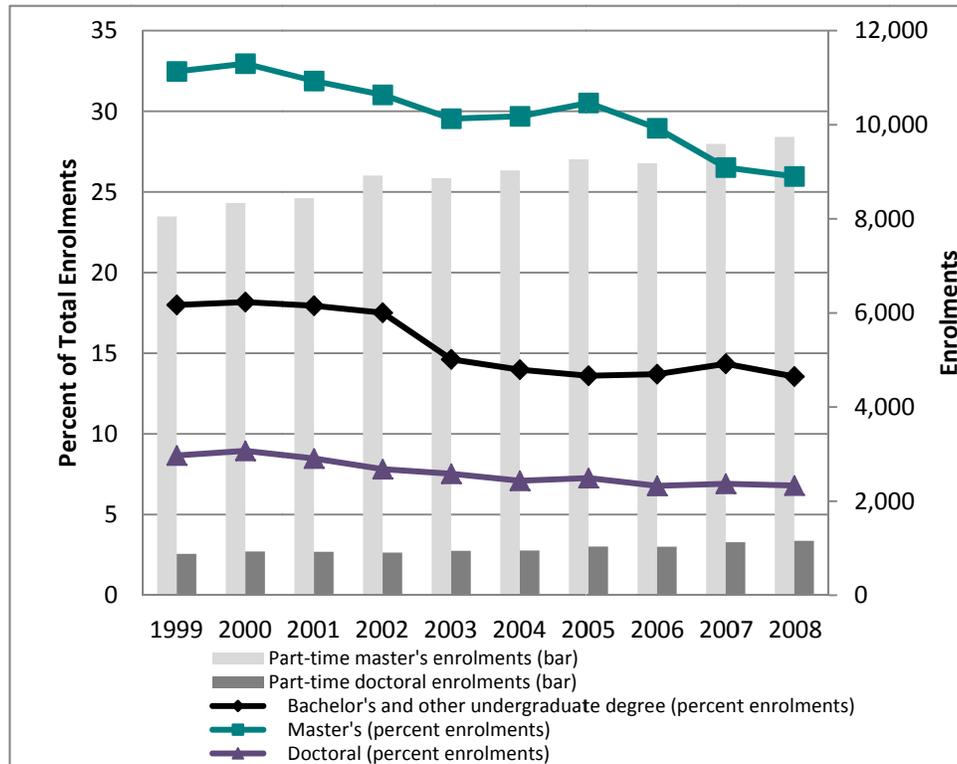
While overall graduate student enrolments have increased over the past decade, it is worth considering if the composition of that population has also shifted in any significant ways. This section examines if and how gender and age distributions, international student representation and part-time enrolments of graduate students at Ontario universities have changed over time.

Traditionally, master's programs have seen the highest ratio of part-time registrants⁶ (approximately one-third to one-quarter of the total), while doctoral programs have far fewer students who register for part-time study (below 10 per cent). Chart 5 shows that during the past decade, while there has been a slight increase in the actual number of

⁶ Full-time and part-time students are determined by their registration status as defined by the reporting postsecondary institution (Statistics Canada, 2009).

part-time enrolments, there has been a steady decline in the proportion of university students engaged in part-time study at all three levels. Part-time enrolments as a percentage of total enrolments also declined across the rest of Canada, with the ratio of part-time doctoral students falling even more dramatically nationally from nearly 12 per cent to 5 per cent between 1999–00 and 2008–09.

Chart 5: Part-time Enrolments, Ontario Universities (1999–00 to 2008–09)

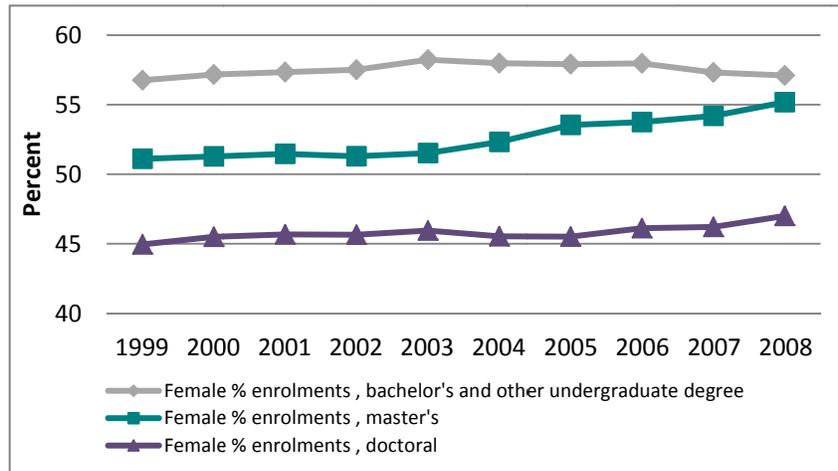


Source: Statistics Canada, PSIS

There has also been little change over the past decade in terms of the gender distribution at Ontario universities (Chart 6). While the percentage of females at the undergraduate level appears to have peaked at 58 per cent, female registrants accounted for nearly 55 per cent of enrolments at the master's level in 2008–09, and have yet to reach 50 per cent at the doctoral level.⁷ Similar trends are found in the rest of Canada, where the percentage of females enrolled in graduate programs has reached 56 per cent at the master's level and 47 per cent at the doctoral level.

⁷ Females comprise nearly 80 per cent of enrolments in graduate programs of Education and Health, Parks, Recreation and Fitness, and less than 20 per cent in Agriculture, Natural Resources and Conservation, Architecture, Engineering and Related Technologies, and Personal, Protective and Transportation Services.

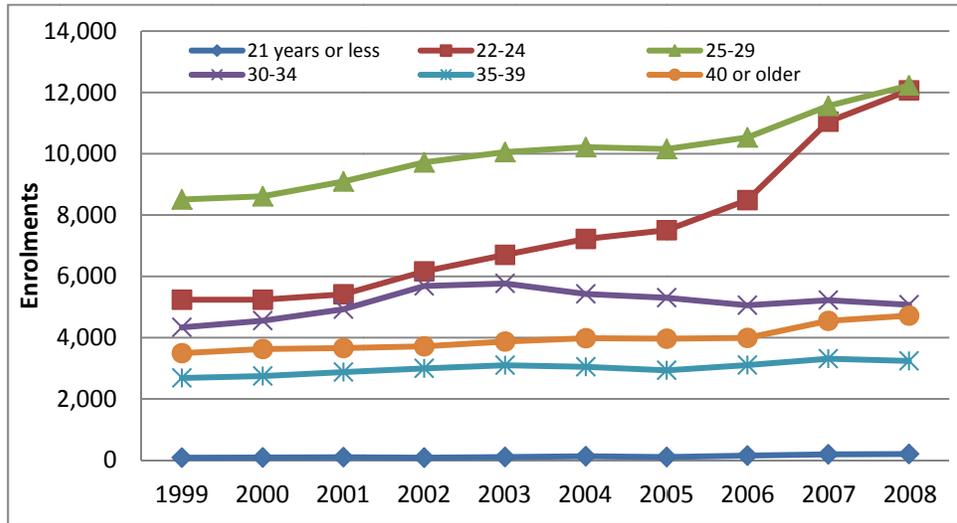
Chart 6: Female Enrolments, Ontario Universities (1999–00 to 2008–09)



One of the rationales for the expansion of graduate spaces at Ontario universities was to provide postgraduate opportunities for students from the double cohort who would be completing their first program of study as early as 2006 and 2007. Not surprisingly, almost all of the growth in master's enrolments has been among precisely that target population, particularly since 2005, with students aged 22–29 comprising two-thirds of all enrolments by 2008–09 (Chart 7).⁸ The trend is considerably different in the rest of Canada where enrolments increased fairly evenly across all age groups, and the percentage of master's students between the ages of 22 and 29 has remained steady.

⁸ A smaller shift has taken place in the student age distribution of Ontario doctoral programs in recent years, though even there nearly 50% of students enrolled as of 2008 were aged 22–29.

Chart 7: Master’s Degree Enrolments by Age Group, Ontario Universities (1999–00 to 2008–09)

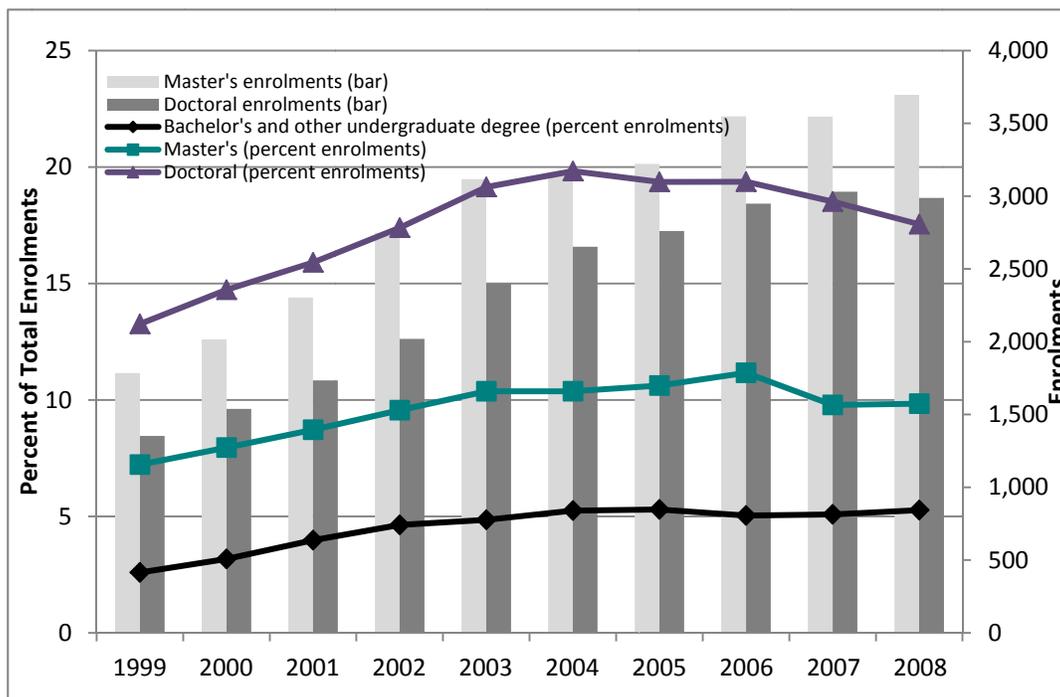


Source: Statistics Canada, PSIS

Many provinces have come to view the recruitment of international students as part of their immigration strategy; students who come to Canadian postsecondary institutions to study often decide to stay in Canada when they graduate (OECD, 2006). In the 2010 Speech from the Throne, the Ontario Government announced it would increase international enrolments throughout the postsecondary sector by 50 per cent (Office of the Premier, 2010). This was followed by the October 2010 announcement of the Ontario Trillium Scholarship. Each Ontario Trillium Scholarship is worth \$40,000 annually, renewable for a maximum of four years. There will be 75 scholarships awarded each year, with the first students being offered scholarships to begin their studies in Ontario in September 2011 (Study in Ontario, 2011).

The number of international students in Ontario has increased significantly since 1999, doubling at both the doctoral and master’s levels (Chart 8). In Ontario, international students represented nearly 10 per cent of master’s students and 17.5 per cent of doctoral students in 2008–09. Despite the high numbers of international students, the even more significant increase in domestic enrolments at Ontario universities in recent years has resulted in an actual decline in the percentage share of international students, declining from a peak of nearly 20 per cent (2004) at the doctoral level.

Chart 8: International Students, Ontario Universities (1999–00 to 2008–09)



Source: Statistics Canada, PSIS

In the rest of Canada, the proportion of international students compared to domestic students is slightly greater at both the master’s and doctoral levels. In 1999–00, almost 20 per cent of doctoral enrolments were international students in the rest of Canada, increasing to 22.5 per cent by 2008–09. The representation of international students in the rest of Canada also increased at the master’s level, growing from 10 per cent of enrolments in 1999–00 to 14 per cent by 2008–09.

Impact on Ontario Universities and Programs

The recent and substantial expansion of graduate enrolments across Ontario has impacted both individual universities and their program offerings. Chart 9 shows the enrolment trends since 1999–00 of graduate students at those Ontario universities that offer graduate degrees:

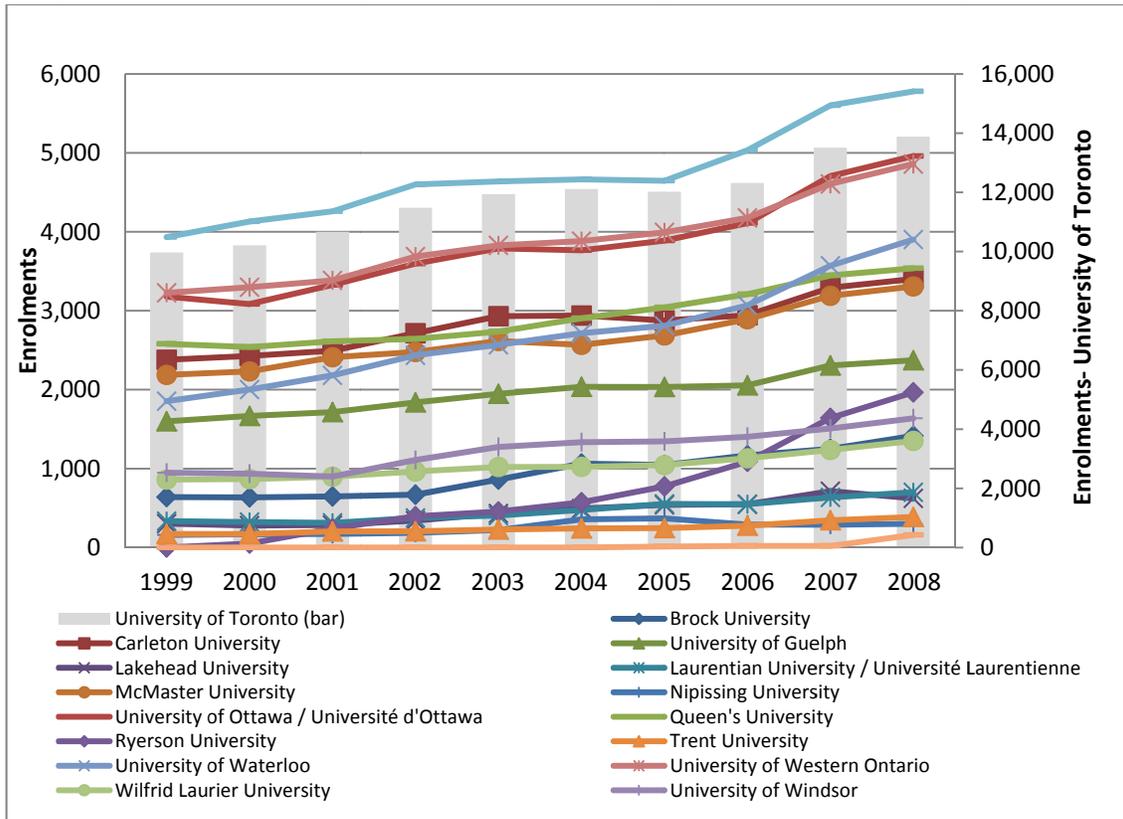
- One group of seven institutions had one thousand or fewer graduate students a decade ago (excluding those institutions which did not yet have graduate programs in 1999–00).⁹ These smaller institutions averaged

⁹ While Dominican University College could also be included in this category, we have excluded it from this analysis as its enrolment numbers are significantly smaller than other institutions in this group (growing from 42 in 1999 to 57 in 2008).

enrolment growth of just over 7 per cent over the 10 years examined; Ryerson University only began to offer graduate degrees in 2000, and from 2002 grew at an average annual rate of more than 30 per cent, to a total of nearly two thousand graduate students in 2008–09.

- Another group of five universities with approximately 1,500 to 2,500 graduate students each in 1999–00 experienced an average rate of growth of about 5 per cent per year since then. Within this group there were two outliers: graduate enrolments at Waterloo expanded at a faster pace (average growth rate of 8.2 per cent), while Guelph expanded at a somewhat more gradual pace (average growth rate of 4.3 per cent over the 10-year period).
- A third group of three universities with graduate enrolments over 3,000 each in 1999–00 experienced moderate expansion, with an average growth rate of just over 4 per cent between 1999–00 and 2008–09. The University of Ontario Institute of Technology (UOIT), which is represented in Chart 9, and the Ontario College of Art and Design University (OCADU) are notable in that they have developed graduate programs in recent years. Although the data for OCADU are constrained to one year (2008–09), the number of graduate students enrolled at UOIT has grown steadily since 2005, with a considerable increase in 2008–09 to over one hundred students.

Chart 9: Ontario Graduate Student Enrolments by Institution (1999–00 to 2008–09)

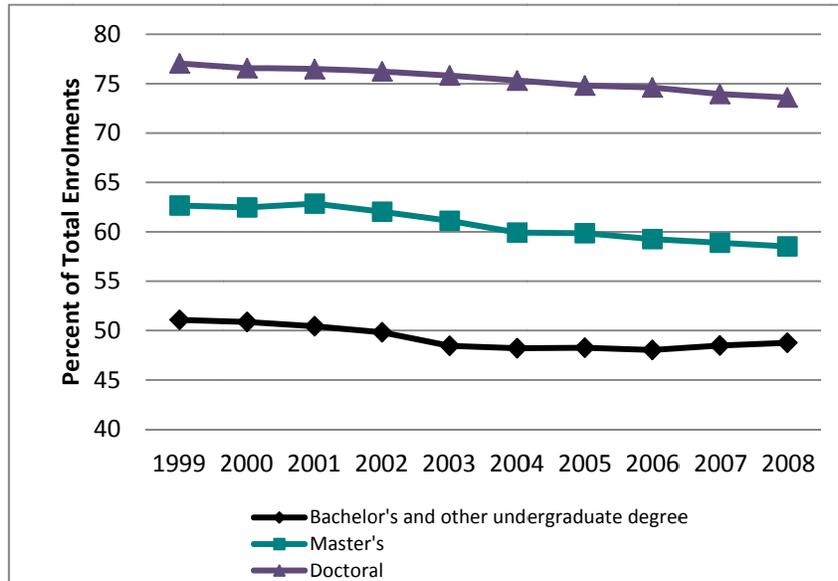


Source: Statistics Canada, PSIS

The University of Toronto stands apart when it comes to graduate enrolments, educating more than 29 per cent of all Ontario graduate students in 2000. While it continues to dominate graduate training in the province, with an annual rate of growth of just over 3 per cent since 2002, the university's share of the provincial total actually declined to 25 per cent in 2008–09. In fact, while the six Ontario members of the Group of Thirteen (G13) research-intensive universities still dominate graduate study in the province, they saw their combined share of graduate enrolments decline somewhat between 1999–00 and 2008–09 from 67 per cent to 63 per cent.¹⁰ On the other hand, as a group, their student profile also remains unique; while the G13 universities currently educate fewer than 50 per cent of the province's undergraduate students, they train nearly 75 per cent of all doctoral candidates (Chart 10).

¹⁰ The six Ontario members of the G13 are the University of Toronto, University of Western Ontario, University of Ottawa, University of Waterloo, Queen's University and McMaster University.

Chart 10: Ontario's G13 Research-Intensive Universities and Their Share of Overall Enrolments (1999–00 to 2008–09)



Source: Statistics Canada, PSIS

Another interesting consequence of the recent expansion in graduate enrolments at Ontario universities has been the shift in field of study choice.¹¹ While almost all fields of study have experienced growth in enrolments at the graduate level, the rate of growth has varied (Chart 11). Enrolments in three fields of study more than doubled between 1999–00 and 2008–09:

- Health, Parks, Recreation and Fitness has experienced the greatest growth (149 per cent)
- Architecture, Engineering and Related Technologies has grown by 104 per cent
- Visual and Performing Arts and Communications Technologies enrolments have doubled

Three other fields of study have experienced moderate growth during this time period:

- Mathematics, Computer and Information Sciences enrolments have increased by 84.5 per cent
- Enrolments in Social and Behavioural Sciences and Law have increased by over 60 per cent
- Physical and Life Sciences enrolments grew by slightly more than 50 per cent between 1999–00 and 2008–09

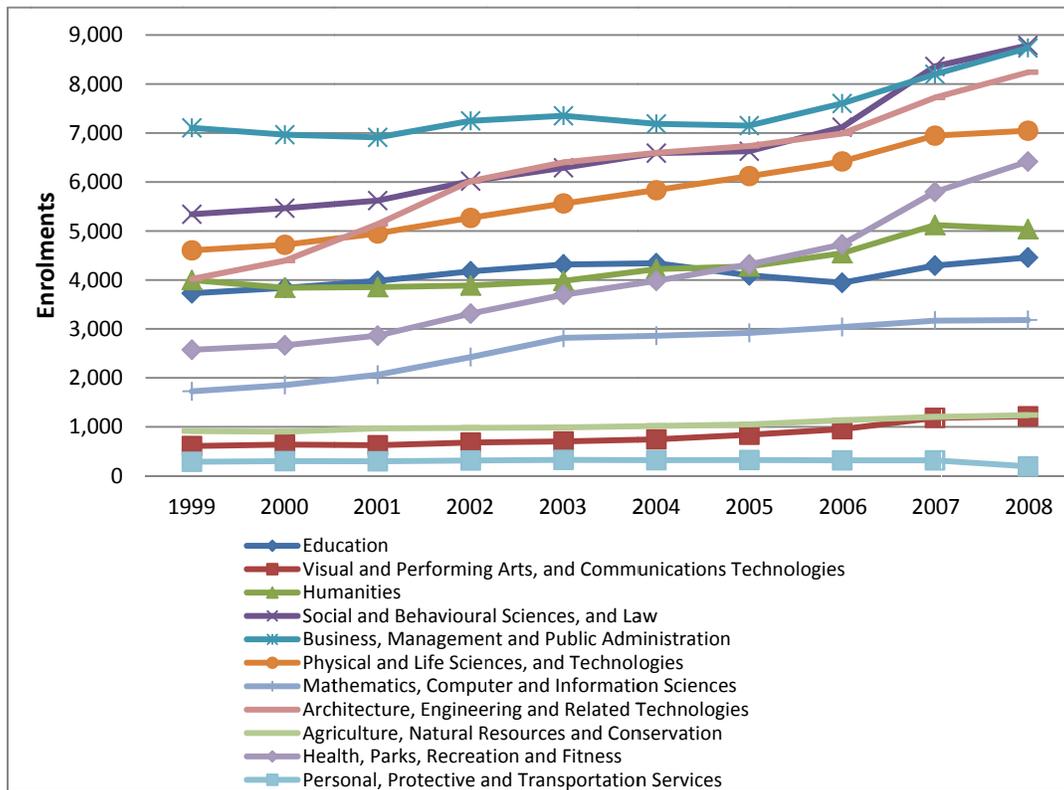
¹¹ Field of study is classified by the primary groupings of the 2000 Classification of Instructional Programs (CIP), Canada (Statistics Canada).

Smaller increases in enrolments were seen in the remaining fields of study:

- Agriculture, Natural Resources and Conservation enrolments have increased by slightly more than one-third
- Enrolments in the Humanities have grown by 26 per cent
- Business, Management and Public Administration had limited growth, with most of the increase occurring since 2005

Exceptions include the field of Personal, Protective and Transport Services, which decreased by one-third,¹² and graduate programs in Education across the province, which experienced the smallest growth in enrolments between 1999–00 and 2008–09.

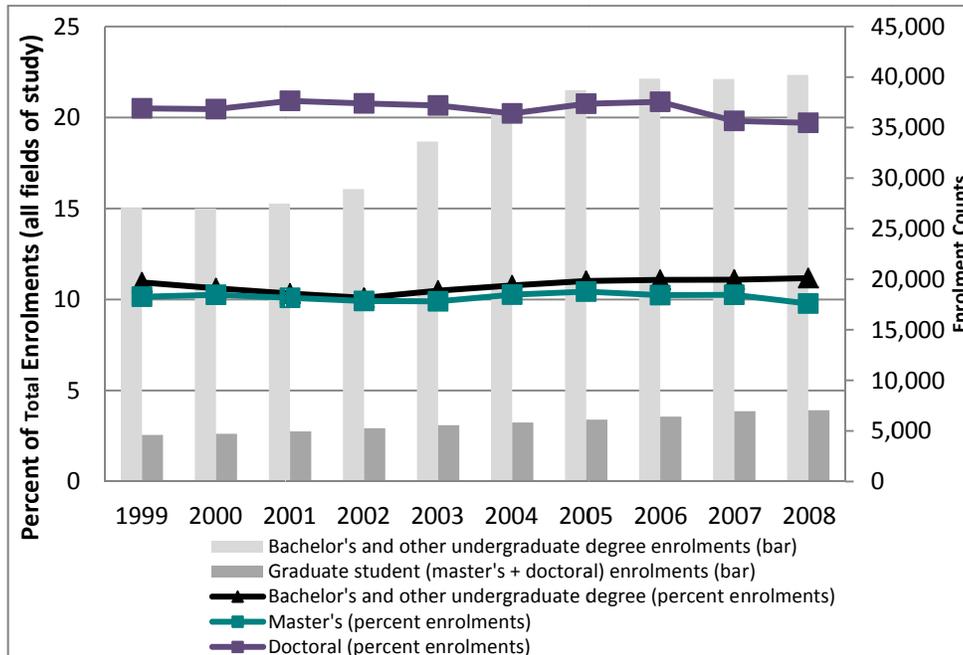
Chart 11: Ontario Graduate Student Enrolments by Field of Study (1999–00 to 2008–09)



¹² However, this field of study has very small numbers compared to the other fields of study. Enrolments actually decreased from 288 in 1999–00 to 192 in 2008–09.

While almost all fields of study have seen an increase in enrolments, the ratio of each field as a percentage of total graduate enrolment has not changed greatly. Chart 12 provides a typical case study, Physical and Life Sciences, and illustrates that while enrolments have increased in terms of total head counts of students, the proportion of enrolments relative to other fields of study in Ontario at both the master's and doctoral levels have remained relatively steady.

Chart 12: Ontario Graduate Student Enrolments in the Physical and Life Sciences (1999–00 to 2008–09)



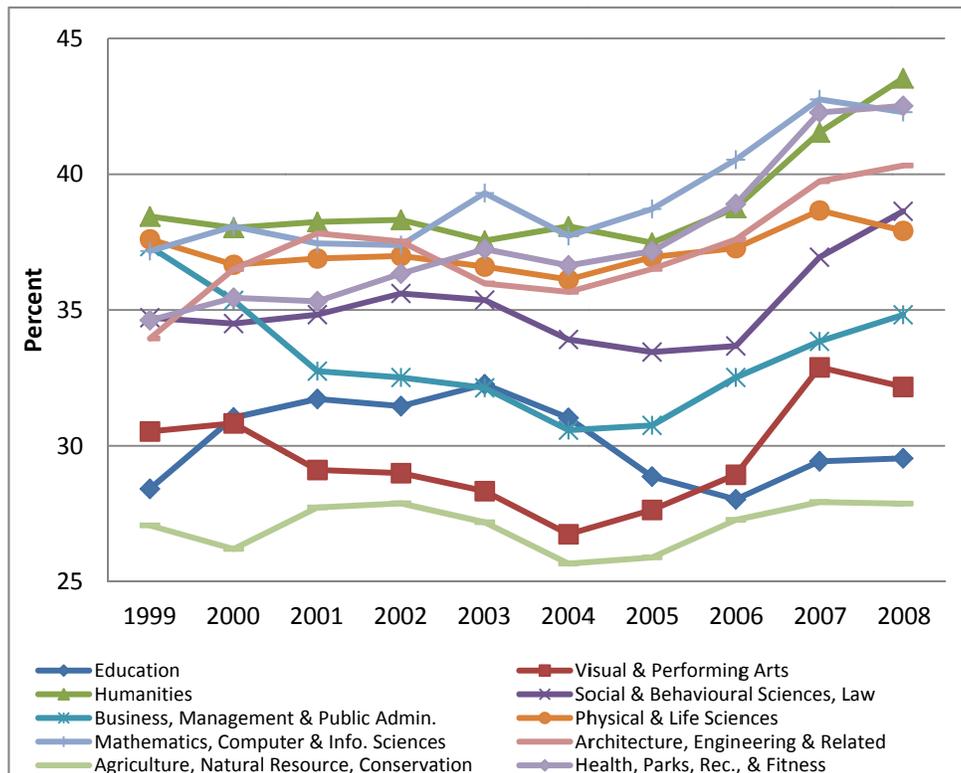
Source: Statistics Canada, PSIS

Among the eleven fields of study categorized in the PSIS data, the only notable shift within Ontario graduate enrolments has taken place at the master's level, where the percentage of enrolments represented by Health, Parks, Recreation and Fitness grew substantially from 1999–00 to 2008–09 (increasing from 8.5 to 13.5 per cent of the total). During the same period, the field of Business, Management and Public Administration saw its share of the total decline by nearly the same amount at the master's level (from 27.3 to 22.8 per cent of the total).

As mentioned earlier, Ontario chose to expand graduate enrolments — especially at the master's level — at least in part due to anticipated demand from double-cohort graduates, and because of Ontario's relatively small share of master's enrolments at the national level. In the aftermath of several years of strong enrolment growth, Ontario universities in 2008–09 were still educating a relatively small share of the nation's graduate students in both Education (28 per cent) and in Business, Management and Public Administration (34 per cent). Humanities fields, meanwhile, have experienced

the strongest growth recently, with Ontario universities educating more than 42 per cent of the national share of graduate students by 2008–09.

Chart 13: Ontario Enrolments as Percentage of the National Total, by Field of Study (1999–00 to 2008–09)



Source: Statistics Canada, PSIS¹³

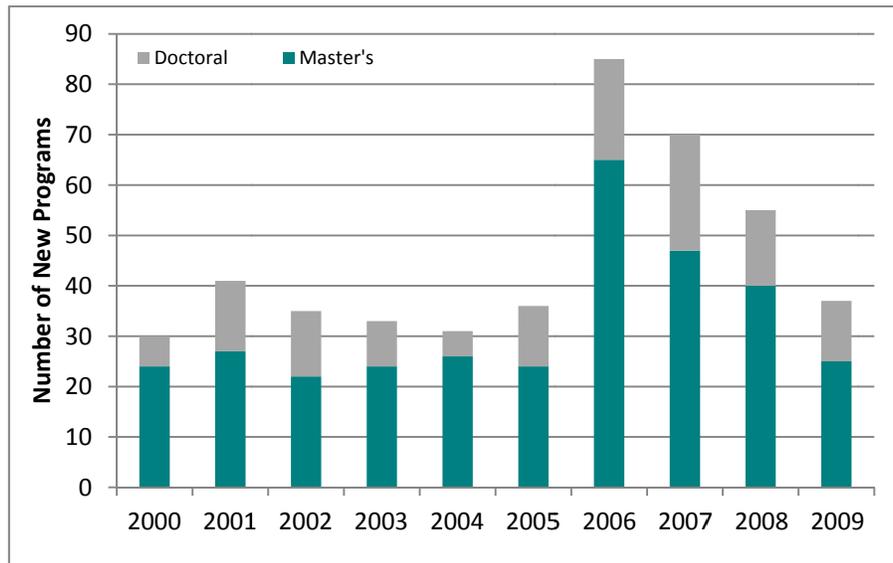
¹³ Due to the fact that the number of enrolments in the field of Personal, Protective and Transportation Services for the rest of Canada is extremely small, this field was excluded from Chart 13. Ontario's share of graduate enrolments in this field is disproportionate, representing over 80 per cent of Personal, Protective and Transportation Services enrolments in Canada during the years studied.

Development of New Programs

Beyond understanding in which institutions and fields of study enrolment growth has taken place, it is also important to consider the growth of new graduate programs of study. This is important to understand, since only some of the recent growth could be met by expanding existing programs; in many cases, the creation of entirely new master's and doctoral programs was required to accommodate the growing influx of graduate candidates.

The Ontario Council on Graduate Studies approves new graduate programs to commence after receiving an application from a university and then conducting a rigorous review. Using their data from 2000–01 to 2009–10, the following charts indicate that there has been a significant expansion of master's and doctoral programs since 2006–07, with the majority of growth clearly taking place at the master's level.

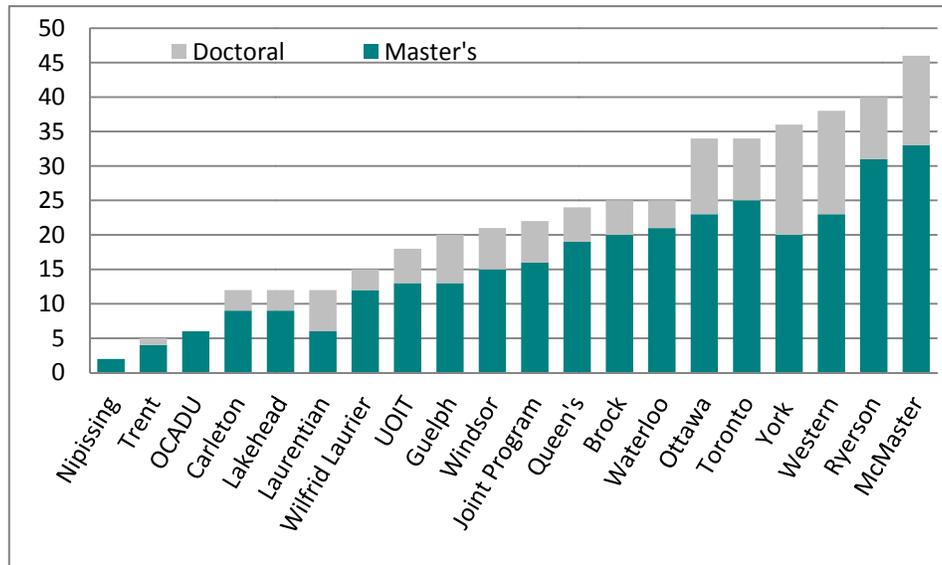
Chart 14: Number of New Graduate Programs Permitted to Commence in Ontario (2000-01 to 2009-10)



Source: Derived by HEQCO from OCGS data

As Chart 15 shows, there has been program growth across most Ontario universities. Some, such as UOIT and Nipissing, are just beginning to develop their graduate offerings. Others, such as Guelph, Laurentian, and Windsor, have increased their program offerings. Those that are the significant providers of graduate programming (i.e., those in the G13) have also increased their numbers, such as the University of Western Ontario and the University of Toronto. Two universities in particular have substantially increased their program offerings over the past decade: Ryerson (by 40) and McMaster (by 47). As noted previously in Chart 9, these two institutions have also seen the largest growth in overall graduate enrolment during the past decade.

Chart 15: Number of New Graduate Programs Permitted to Commence, by Institution (2000-2010)



Source: Derived by HEQCO from OCGS data

Summary

This “At Issue” paper attempted to provide an overview of recent trends in graduate enrolments at Ontario universities. The expansion of graduate education has been widespread, and the growth has had some effect on the demographic composition of this population over the period examined. Overall, there are far more 22- to 24-year-olds and an increasing ratio of females, and proportionately fewer international and part-time students. Growth has taken place across almost all fields of study, and Ontario also has an increasing share of the national total of graduate students across nearly all disciplines.

Overall, Ontario and its universities have been very successful in expanding opportunities for graduate study. Assuming most students graduate, these highly qualified individuals will be critical to the success of Ontario in the knowledge-based economy in the future.

Future Research

With the completion of this overview of enrolment trends in graduate education between 1999–00 and 2008–09, many additional research questions have also emerged. Following on previous research on master’s education (CAGS, 2006), doctoral education (Elgar, 2003; King, 2008; *The Disposable Academic*, 2010; Desjardins & King, 2011) and various recent commentaries about the quality of graduate education (CFS-O, 2010; OCUFA, 2007; Magnusson, 2009), a great deal of

work could be done in the future to enhance the understanding of graduate education in Ontario.

The experience of graduate students is clearly an area in need of further exploration. Future HEQCO research will utilize the Canadian Graduate and Professional Student Survey (CGPSS), which was undertaken at all Ontario universities in 2007 and 2010. Building on previous HEQCO-funded research which examined the CGPSS data at one institution (Spence, 2009), the central objective of this forthcoming analysis will be to determine what elements of graduate programs influence the level of student satisfaction with their academic experience, while also accounting for the potential effects of various student characteristics. Focusing on Ontario graduate students, this research will also examine what factors influence this population's satisfaction with the quality of faculty supervision and course instruction. We will also investigate the extent to which graduate students receive training related to their professional development, and use the CGPSS data to look at what students identify as major obstacle(s) to program completion.

In November 2010, HEQCO announced the launch of 13 research projects that will assess various initiatives designed to enhance Teaching and Learning. Four of those projects focus on various aspects of enhancing the teaching skills of graduate students. Both the University of Toronto and the University of Western Ontario will be looking at how graduate teaching assistants can be developed as members of a teaching team and how international graduate students with teaching assistant responsibilities can be better integrated into the Canadian classroom. The University of Windsor is also leading two research projects that will focus on teaching development and certificates for graduate students.

Given the continuing importance of this topic, and the substantial investments being made by the province, as well as students and universities, there are numerous other areas of research that might be worth considering for future study:

- Institutional impact — Have the significant increases in enrolment impacted the overall organisation, administration, funding and priorities of Ontario universities?
- Master's graduations — Has the increase in enrolments resulted in similar increases in graduate degree completion? Has the demographic composition of graduate degree holders changed since the expansion of graduate studies in Ontario?
- Doctoral education — Is there an excess or demand in supply for PhD holders? How many doctoral graduates, for instance, pursue academic employment, and what types of occupations are held by those who do not follow this path?

- Student experience — Have class sizes or student/faculty ratios changed? What are the average completion times and rates for various graduate programs?
- Labour market outcomes — What are the labour market outcomes for graduate students in terms of earnings, employment status, and occupation?
- Science, Technology, Engineering and Math (STEM) — What are the specific enrolment trends, as well as student choices and challenges, and what are their labour market outcomes?
- Postdoctorates — An increasingly large number of doctoral degree holders are taking up postdoctoral research positions. What role do they play in the university community, what are the labour market outcomes for these graduates, and what are the labour conditions under which they work?
- Student cost — Has the recent growth in federal, provincial and institutional scholarships and other support for graduate students — as well as recent changes to federal and provincial tax exemptions and credits — resulted in making graduate study more affordable for the average master's and doctoral candidate at an Ontario university?
- Research capacity and productivity — Has research activity at institutions been impacted by the increased number of graduate students? Is there overall increase in innovation in the economy? If so, can it be linked to graduate degree holders?

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