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So You Want to Earn a PhD? The Attraction, Realities, and Outcomes of Pursuing a Doctorate

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Executive Summary

While it requires a significant amount of time and persistence, completing a PhD is not now – nor has it ever been – a guaranteed path to a lucrative end, and its general value has come under increasing scrutiny in recent years. This paper is written for aspiring doctoral students, current doctoral students or candidates, recent doctoral graduates, as well as their families and friends. It provides detailed information about the evolution of the PhD and of the broader labour market and educational environment in which it is embedded. The analyses provided in this paper also lead to recommendations to government and institutions about PhD programs. The paper:

1. provides a detailed explanation of the PhD as an academic credential;
2. outlines the expectations that accompany admission to a doctoral program;
3. chronicles the recent rise in doctoral enrolments in Ontario universities;
4. explores the various labour market pathways available to doctoral graduates;
5. offers recommendations to doctoral candidates, graduate programs and governments.

Defining the PhD

The PhD is the third tier in the academic hierarchy, usually available to those who have first obtained a bachelor's and a master's degree in a related field of study. Its requirements can vary greatly from one institution to the next, but generally include the completion of coursework and comprehensive exams, the proposal of a research topic, and the completion of a thesis or dissertation. Some programs may also require that students demonstrate proficiency in certain languages other than English that may be judged necessary to conduct research. Doctoral students, especially those hoping to pursue academic employment, may also be encouraged to publish their research and present it at academic conferences.

Most doctoral students also receive some kind of support to help fund the pursuit of their degree. Depending on the institution and the student, these sources of funding can include teaching or research assistantships, institutional fellowships and scholarships, and external scholarships from federal, provincial or private agencies.

Trends in Doctoral Enrolment

Over the last ten years, enrolments in many graduate programs in Ontario have increased – supported by increased federal and provincial funds – based on the anticipated retirement of many older university faculty members, an expanding undergraduate student population (especially in Ontario), and a belief that an increasingly competitive and globalized economy required more highly qualified personnel (HQP).

All Ontario universities are shown to have expanded their graduate programs over the past decade, with enrolment in doctoral programs having nearly doubled from 10,192 in 1999 to just over 19,000 in 2009. This increased enrolment has also led to a change in the demographic composition of the doctoral student body. Much of the growth in doctoral enrolments has occurred in the youngest segments of the population, especially among those aged 25 to 29 or, more recently, 22 to 24. While each grouping of academic fields of study has experienced enrolment growth at the doctoral level since 1999, rates have been highest in the social and behavioural sciences, humanities, and physical and life sciences.

Attrition rates for doctoral students and time to completion have also become important issues, given the personal and financial commitments associated with pursuing a doctorate. A national study completed nearly

a decade ago estimated that at least 50 per cent of PhD students in the humanities, 40 per cent in the social sciences, and 25 per cent in the physical and life sciences never complete the final requirements of the doctorate, and the average time to completion for those who did earn a doctorate was five to six years.

Labour Market Pathways

For many, the perceived earning potential of the PhD can play a significant role in the choice to pursue the credential. Given the time that it takes to complete the degree, time for which most students are removed from the work force and from significant wage earnings, the premium that the doctorate might or might not offer upon graduation is even more important to take into consideration. While census and other data show that doctoral graduates in the Canadian labour force consistently experience among the lowest rates of unemployment, data presented in this paper demonstrate that the average PhD wage premium is less than that for a master's degree, and that the overall earnings return for a PhD is also less for men than for women.

The paper also considers the various options, pathways and challenges that doctoral students and graduates face as they begin to re-enter the work force upon graduation. Roughly two-thirds of Ontario PhDs pursue their degree with the intention of becoming a university professor. For new graduates, the supply of PhDs being earned each year vastly outnumbers the demand for new full-time faculty. While an increasing number of students enter the PhD for reasons other than to become a professor, the fact remains that, in the social sciences and humanities in particular, many programs continue to train and mentor students for careers in academia that are harder and harder to come by.

The paper closes by profiling some of the alternative options to permanent academic employment available to graduates from PhD programs, including postdoctoral work, contract university teaching, university teaching-stream positions and college instructor positions, and by discussing some of the potential difficulties involved in the transition to non-academic work.

Introduction

In 2010, *The Economist* published a story with the following provocative title: "The disposable academic: Why doing a PhD is often a waste of time." A few months later, the prestigious American scientific journal *Nature* devoted portions of an entire issue to a cover story about "The future of the PhD," including an editorial calling for governments and universities around the world to "Fix the PhD." Canada's *University Affairs* (Charbonneau, 2011) also recently published an article entitled "Is Canada producing too many PhDs? Yes, no and maybe" and, more recently, it published another article, "The PhD is in need of revision," (Tamburri, 2013) which addresses the growing concern that far too many PhDs are dropping out of doctoral programs and taking too long to finish. At a time when doctoral programs are expanding in nearly every country, a growing chorus of voices – some from within those same universities – are asking why.[1]

While it requires a significant amount of time and persistence, completing a PhD is not now – nor has it ever been – a guaranteed path to a lucrative end. The individual decision to pursue a doctorate can be motivated by a variety of personal and professional goals, and obviously comes with a number of unknowns. Some individuals require the credential if they hope to become a university professor or laboratory researcher. Others may be drawn, at least originally, by the intellectual challenge or the offer of funding support. The doctorate may also be the culmination of a lifelong dream or a source of family, social or personal pride. Regardless of the initial motivation to pursue a doctorate, the process itself – and the labour market realities that emerge upon graduation – can be far more challenging than expected.

This paper is written for aspiring doctoral students, current doctoral students and candidates, and recent doctoral graduates, as well as for their supportive and/or perplexed families and friends. First, an explanation of the academic credential and its meaning will be provided. This will be followed by an examination of recent doctoral enrolment trends in Ontario universities. Finally, this paper will explore the various labour market pathways for doctoral graduates. Included throughout, whenever possible, are the voices of doctoral students themselves.

Defining the Doctorate

The title of Doctor of Philosophy originates from the Latin expression *philosophiae* (love of wisdom) *doctor*. Dating back to nineteenth-century Germany (Noble, 1994), it has changed very little since its inception. It is generally abbreviated in North American institutions as Ph.D. or PhD, and is used to describe the third tier in the traditional hierarchy of university education. A typical doctoral student at an Ontario university has already completed the following:

- An **honours bachelor's degree**, generally requiring four years of university course work in a specialized area (BSc for science, BA for arts and humanities, etc.);
- A **master's degree**, usually involving as much as one additional year of course work, often combined with the completion of a major research project or thesis, which makes for a two-year program on average.[2]

[1] See Sweeney, 2012.
[2] Some doctoral programs, particularly in the United States and in some of the STEM (Physical and Life Sciences, Technologies, Engineering, and Mathematics, Computer and Information Systems) fields in Canada, may offer either entry into the PhD directly from the bachelor's degree, a "fast track" track option where the student transfers to the doctorate before completing the master's, or a combined MA-PhD program.

In addition to previous academic credentials, usually in related academic fields, a number of other factors are taken into consideration when an individual applies for admission into a doctoral program:

- postsecondary grades, as well as the reputation of prior institutions/programs of study;
- reference letters from university faculty familiar with the research abilities and potential of the applicant. Professional references may also be required or considered, depending on the nature of the program;
- an indication of the candidate's proposed area of doctoral research, and consideration of its compatibility with the available expertise of the faculty and department considering the application;
- any prior experience – academic or professional – that demonstrates the applicant's capacity to successfully undertake doctoral research in that field;
- for foreign students, a demonstration of English language abilities through the successful completion of a proficiency test, such as the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS), or the equivalent for French-speaking universities.

If offered admission, the doctoral student is then likely to be expected to complete successfully some combination of the following:

- required course work (some Canadian doctoral programs require minimal course work depending on the program, while some US programs require the equivalent of two full years of additional courses, and most UK universities do not require course work at all);
- comprehensive examinations, oral and/or written, that are meant to verify a level of knowledge of the scholarship and research methods in relevant academic fields;
- a proposal of the intended doctoral research topic, and its approval by a faculty committee before beginning research;
- expectations that students publish in academic journals and books, or at the very least that their work is publishable, and for those students who receive funding to do so, the expectation that they attend conferences to showcase their work;
- depending on the program of study, some students may also be required to demonstrate proficiency in one or more foreign languages, as well as other specialized skills (such as statistics programs, etc.).[3]

The requirements for the doctoral program of study are usually completed more or less in the preceding order, though students may commence their dissertation research while having outstanding courses or comprehensive or language exams to complete. Generally, once course work and comprehensive examinations have been successfully completed, the doctoral student is designated a doctoral "candidate," though some programs may require successful defense of the dissertation proposal as well. Some doctoral candidates will actually add the title "ABD" (all but dissertation) to their salutation on business cards and emails after this point, though others consider this to be a questionable practice.

From this point forward, much of the individual's time is devoted to conducting and writing a piece of original academic research known as a dissertation or thesis, which normally must be defended upon completion before a panel of academics with expertise in the field. The dissertation may take shape as a stand-alone "book" with a table of contents and chapters, or as a "sandwich thesis," more common in the sciences,

[3] The University of Ottawa and Carleton University require PhD students to demonstrate proficiency in either English or French, and some US programs require doctoral candidates to pass two or more foreign language requirements.

comprised of three or more independent papers that, together with other content, are considered to form an original contribution to the field.

In the social sciences and humanities disciplines, the dissertation is more likely to be made up of independent research undertaken under the direction of a faculty supervisor, while in many of the STEM[4] disciplines the research may form part of a larger research project in collaboration with other faculty and graduate students. In either instance, the supervisor-candidate relationship has been considered by many to be more akin to that of an apprenticeship or mentorship, with the doctoral candidate learning the skills of the discipline through practice and under the close supervision of his/her supervisor. In the social sciences and humanities, meanwhile, the growth of enrolments has made it more difficult to maintain this level of one-on-one interaction in many disciplines.

Thanks in part to recently expanded investments from the federal government's research granting agencies (the Social Sciences and Humanities Research Council – SSHRC, the Natural Sciences and Engineering Research Council – NSERC, and the Canadian Institutes of Health Research – CIHR) and from the provincial government and the universities themselves, most doctoral candidates receive some combination of the following types of funding support:

- **Teaching and/or research assistantships** are most common. These are awarded (or offered, if the positions are unionized) by the institution and allow the doctoral student to work on campus for up to ten hours per week (Ontario universities). TA responsibilities include teaching tutorials, marking exams, supervising exams and holding office hours. Responses to the 2010 Canadian Graduate and Professional Survey (CGPSS) indicated that 85 per cent of Ontario doctoral candidates receive this type of support at some point in their doctoral training (Zhao, 2012). RAs may write literature reviews or reports, enter/analyze data, and generally assist with any research-related tasks requested by the supervisor for whom they work. In the STEM disciplines, the RA work is more likely to be directly related to the dissertation, and thus assists students in completing their degree.
- **Institutional fellowships, scholarships** (usually merit-based) **or bursaries** (usually based on financial need) are also common. These awards either cover the costs of tuition for at least some of the initial years of doctoral study (also known as tuition waivers or deferrals, since the student never actually receives the funds him- or herself), or they are paid out to the student over the course of the academic year. Overall, 64 per cent of Ontario doctoral candidates responding to the 2010 CGPSS reported receiving a university-funded fellowship or bursary (Zhao, 2012).
- **External scholarships** are also available to some students. These generally require a separate application and can be held at any institution the student chooses to attend. Doctoral candidates completing the 2010 CGPSS reported that federal and provincial scholarships or fellowships accounted for 45 per cent of their funding support (Zhao, 2012):
    - Federal awards from SSHRC, NSERC and CIHR range in value from $20,000 to $35,000 per year and can be held for a maximum of three years. The majority of these federal awards can even be held at universities outside of Canada if one of the student's previous degrees was obtained from a Canadian university, though the more selective and higher value Canadian Graduate Scholarship (doctoral and master's) is only tenable at a Canadian university.
    - The even more prestigious Vanier Canada Graduate Scholarship (CGS), which is also funded through the Tri-Council, is valued at $50,000 per year for up to three

[4] Science, Technology, Engineering, and Math. This STEM definition comes from the Postsecondary Student Information System (PSIS), provided by Statistics Canada.

years and must be held at the Canadian university that nominated the student for the award.[5]

- The Ontario Graduate Scholarship (OGS) is the provincial equivalent of the federal Tri-Council awards and must be held by a provincial resident attending an Ontario university. It is valued up to $15,000 per year for a maximum of three years of doctoral study. Two-thirds of the money is provided by the province and the remaining third is funded by the university. Students must apply and be granted the award each year and they may not hold both the OGS and a Tri-Council award at the same time. The guidelines have changed as of 2013 and two-year awards can now be awarded at the discretion of the university.
- Private competitive sources of funding are also available, such as TD Bank and various industry scholarships, agency fellowships and others through various non-profit organizations.

Some doctoral candidates whose thesis research is in the same area as their supervisor's may work as RAs, receiving indirect funding in the form of stipends from research grants awarded to their faculty supervisor or other faculty by the university or from an external source (CAGS, 2005). International students may bring funding from other countries. A number of students also benefit from more than one funding source; nearly one-third of Ontario doctoral candidates who responded to the 2010 CGPSS reported receiving both institutional and external federal/provincial support (Zhao, 2012). For the few students with the largest scholarships or awards, which may then be combined with TA or RA positions, the total value can be substantial enough that the doctoral candidate could even be described as being "paid to study." In these cases, it is understandable that some PhD applicants with substantial financial support might be persuaded that the completed doctorate should translate into a similarly high-paying career.

Finally, while some students may be "topped up" with additional money as a reward for applying for and winning an external scholarship, other institutions will "pull back" the amount of funding paid out if the student wins an external scholarship. The institutional offer of money is designed to ensure that the student receives a minimum amount of funding regardless of its sources, and students who are granted external awards typically surpass that minimum amount. Not all doctoral students receive enough funding support to fully cover their costs, and nearly 40 per cent also rely on loans, savings or family assistance to fund the remaining costs of their doctoral studies (Zhao, 2012).

Trends in Doctoral Enrolments[6]

The financial resources for the recent growth in doctoral enrolments began to flow from the provincial and federal governments just over a decade ago, justified by an anticipated shortage of PhDs. In numerous studies and reports published early in the new millennium, government agencies, universities, faculty associations and graduate schools kept predicting a pending shortage of highly qualified personnel (HQP):

- many predicted a wave of **retirements of older university faculty** (Smith, 2000; OCUFA, 2001) who would need to be replaced;
- **undergraduate enrolments** were expected to (and did) expand, especially in Ontario, where four factors converged: increased postsecondary participation rates; continued

[5] The program was launched in 2009 and is designed to attract and retain top-tier Canadian and international doctoral students studying in NSERC, CIHR, and SSHRC fields of study at Canadian universities.
[6] This paper uses Ontario data. Canada-wide data are discussed where applicable.

immigration; the "echo boom," as children born of baby boomer parents began to graduate from high school (Foot, 2003; 2006); and the "double cohort," members of which graduated from high school and entered the PSE system in and around 2003;

- it was also believed that the output of Canadian doctoral programs would not be large enough to meet the anticipated demands of an **innovation economy** and of an increasingly global and competitive academic environment as new universities began to be built and expanded outside of Canada.

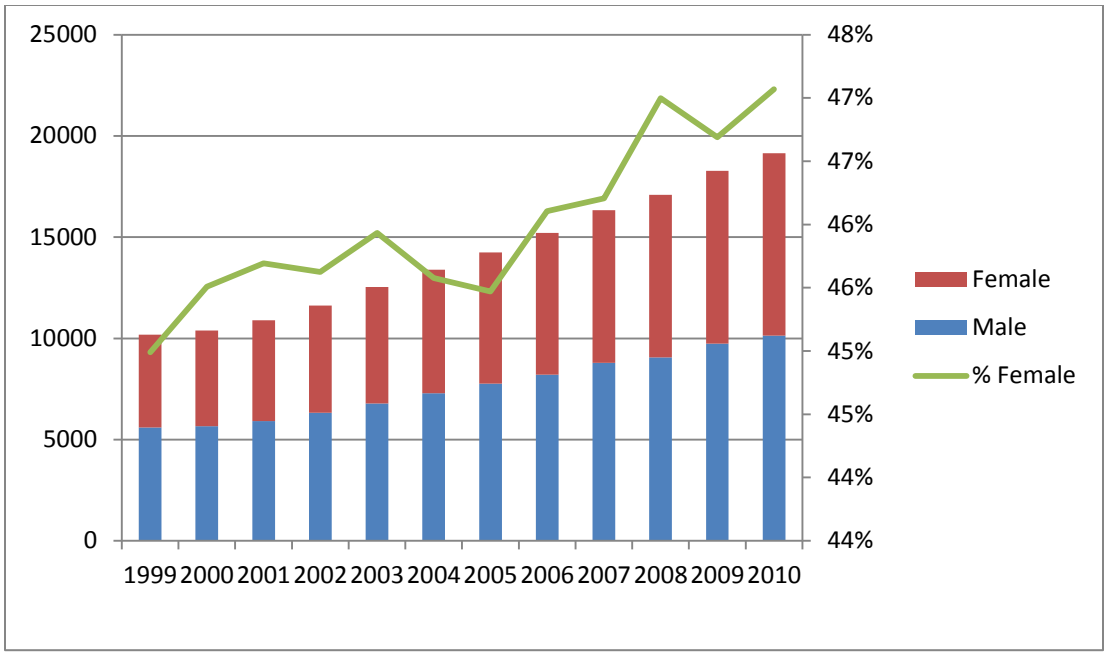
In 2001, the Canadian Association of Graduate Studies (CAGS) called for a doubling of doctoral enrolments to meet the anticipated demand (Bégin-Heick & Associates Inc). As recently as 2007, the Association of Universities and Colleges of Canada (AUCC) was still predicting that "full-time faculty numbers are expected to grow between 3,600 (9 per cent) in the low growth scenario to 13,600 (33 percent) in the high growth scenario" (p. 5). Still others continue to argue that greater numbers of highly qualified personnel with graduate and doctoral credentials are needed, in particular to translate university research into new commercial enterprises (Canada Foundation for Innovation, 2011, p. 3; Executive Heads of G13 Universities, 2008; Statistics Canada, 2007, p. 31). As recently as January 2012, the Council of Ontario Universities (COU) was still asking government for funds to further expand graduate programs to "support innovation" and compete internationally.

The federal government was first to respond to these demands from the university sector. Its *Innovation Strategy* (2002) was followed by a number of other federal initiatives (Indirect Costs of Research, Canada Foundation for Innovation, Networks of Centres of Excellence, Canada Research Chairs, Canada Graduate Scholarships) motivated at least in part by a perception that Canada's doctoral programs needed to be substantially expanded and that there would be large numbers of positions available requiring PhD credentials, both within universities themselves and in the private sector. The Government of Ontario followed that lead with *Reaching Higher* (2005). In both cases, the stated goal was an overall increase in graduate enrolments without any specific targets for doctoral or other numbers, or any focus on particular disciplines or programs.

Previous HEQCO research demonstrates that all Ontario universities have expanded their graduate programs in the past decade (Wiggers, Lennon, & Frank, 2011). Ontario universities have nearly doubled enrolments in their doctoral programs, from 10,182 students in 1999 to just over 19,000 in 2009 (PSIS, 2012). A forthcoming HEQCO report will examine the relationship between government investment in graduate education and the expansion in graduate enrolment (Hall & Arnold, forthcoming 2013).

The gender breakdown of university participation is shifting. Women – who already comprise more than 60 per cent of enrolments at the bachelor's level in Ontario universities and a majority of enrolments at the master's level – are increasing their participation in doctoral programs as well, with 47 per cent of enrolment in 2010 (Chart 1).

Chart 1: Doctoral Enrolments, Ontario, 1999-2010[7]

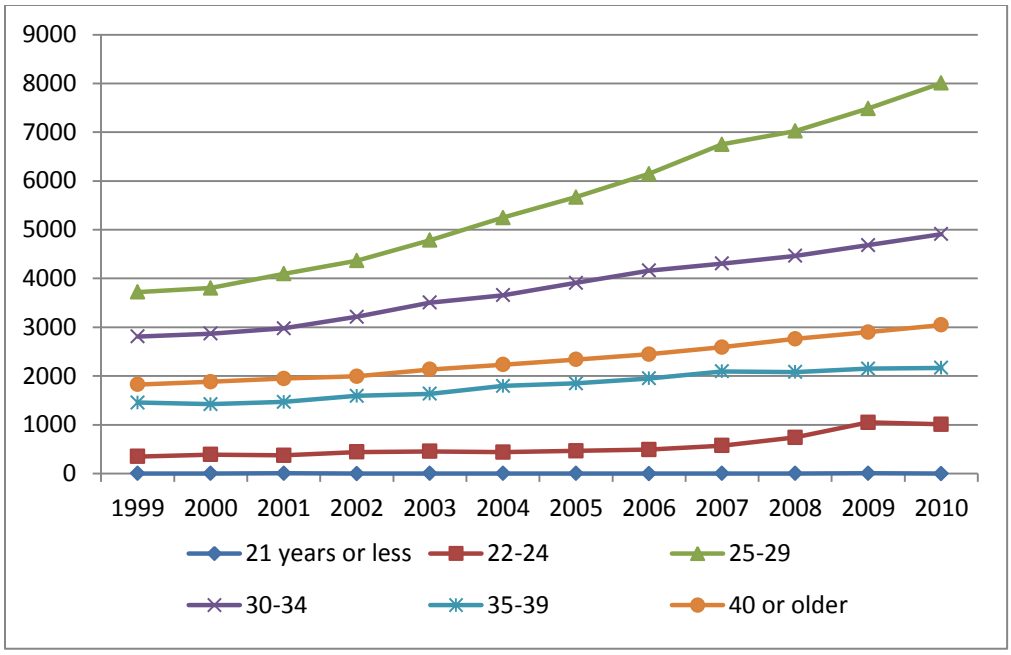


Source: Statistics Canada, Postsecondary Student Information System (PSIS)

Where trends have changed over the past decade is in the age composition of the Ontario doctoral student population. Much of the growth in doctoral enrolments has been in the youngest segments of the population, especially among those aged 25 to 29, and more recently even among those aged 22 to 24, which could be explained in part by the double cohort (Chart 2). Throughout the past decade, in fact, 25- to 29-year-olds have comprised the majority of doctoral enrolments in Ontario universities. A recent Ontario survey indicated that as many as 13 per cent of students about to complete their first undergraduate degree were already planning to pursue a doctorate in the future (OUSA, *What Students Want*, 2011). Much of the movement of increasingly younger cohorts into graduate school in general, and doctoral programs in particular, can be attributed to "credential inflation" in the work force and a perception (real or imagined) that an increasing number of positions require higher levels of education, regardless of the specific skills attached to those positions (Collins, 1979; Desjardins, 2012).

[7] All charts represent full-time and part-time students, though institutions may have different definitions for full-time and part-time enrolment. All charts also represent students regardless of immigration status (Canadian citizen, permanent resident, student visa, other visa and non-Canadian).

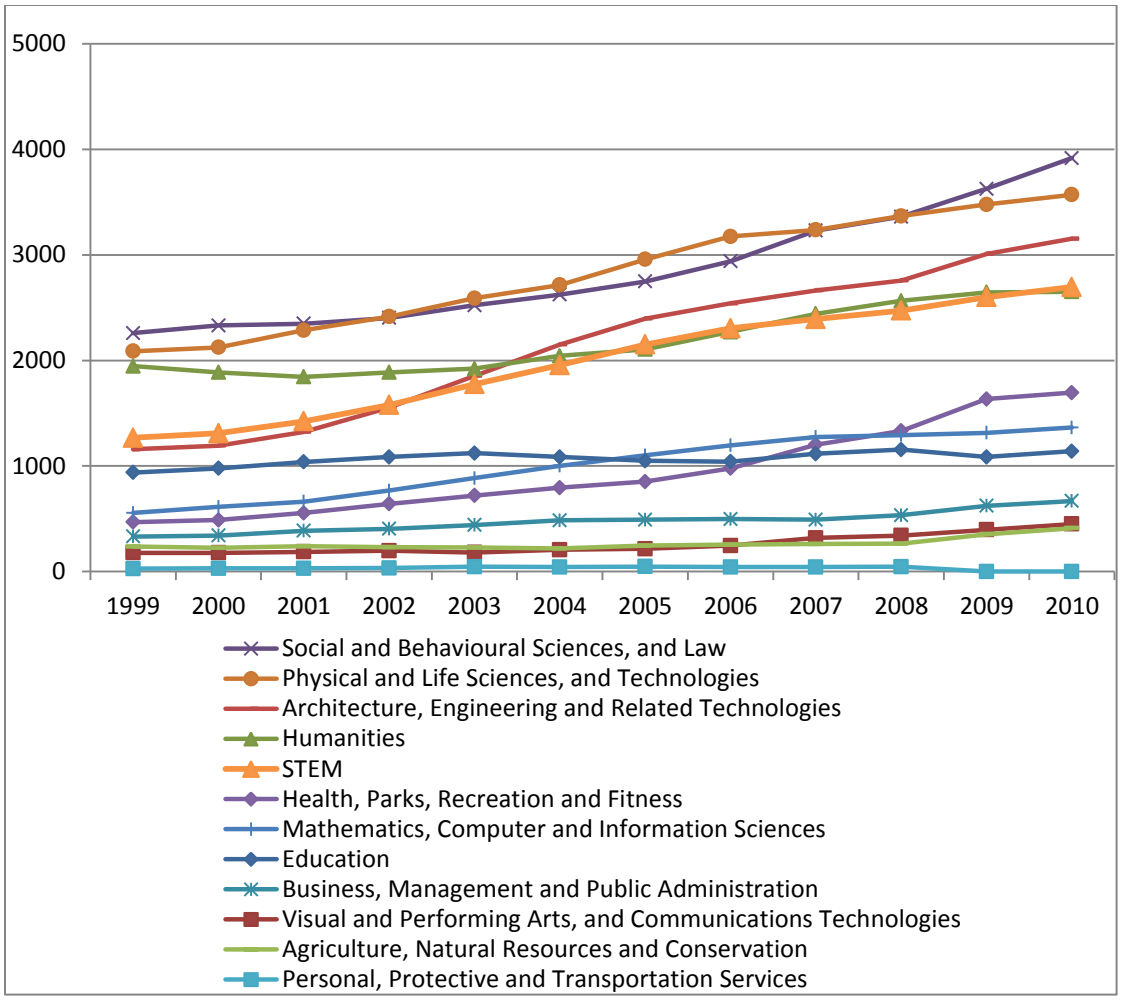
Chart 2: Doctoral Enrolments by Age Group, Ontario, 1999-2010



Source: Statistics Canada, Postsecondary Student Information System (PSIS)

While each grouping of academic fields of study has experienced enrolment growth at the doctoral level over the past decade (Chart 3), the rates of growth have varied. 'Education' programs experienced negligible growth, while 'Social and Behavioural Sciences, and Law'; 'Physical and Life Sciences, and Technologies'; 'Architecture, Engineering and Related Technologies' and 'Humanities' experienced the greatest enrolment increases. Interestingly, most fields seem to have experienced a levelling off of enrolments more recently. There also does not appear to have been any particular targeted growth of doctoral enrolments in most of the STEM fields.

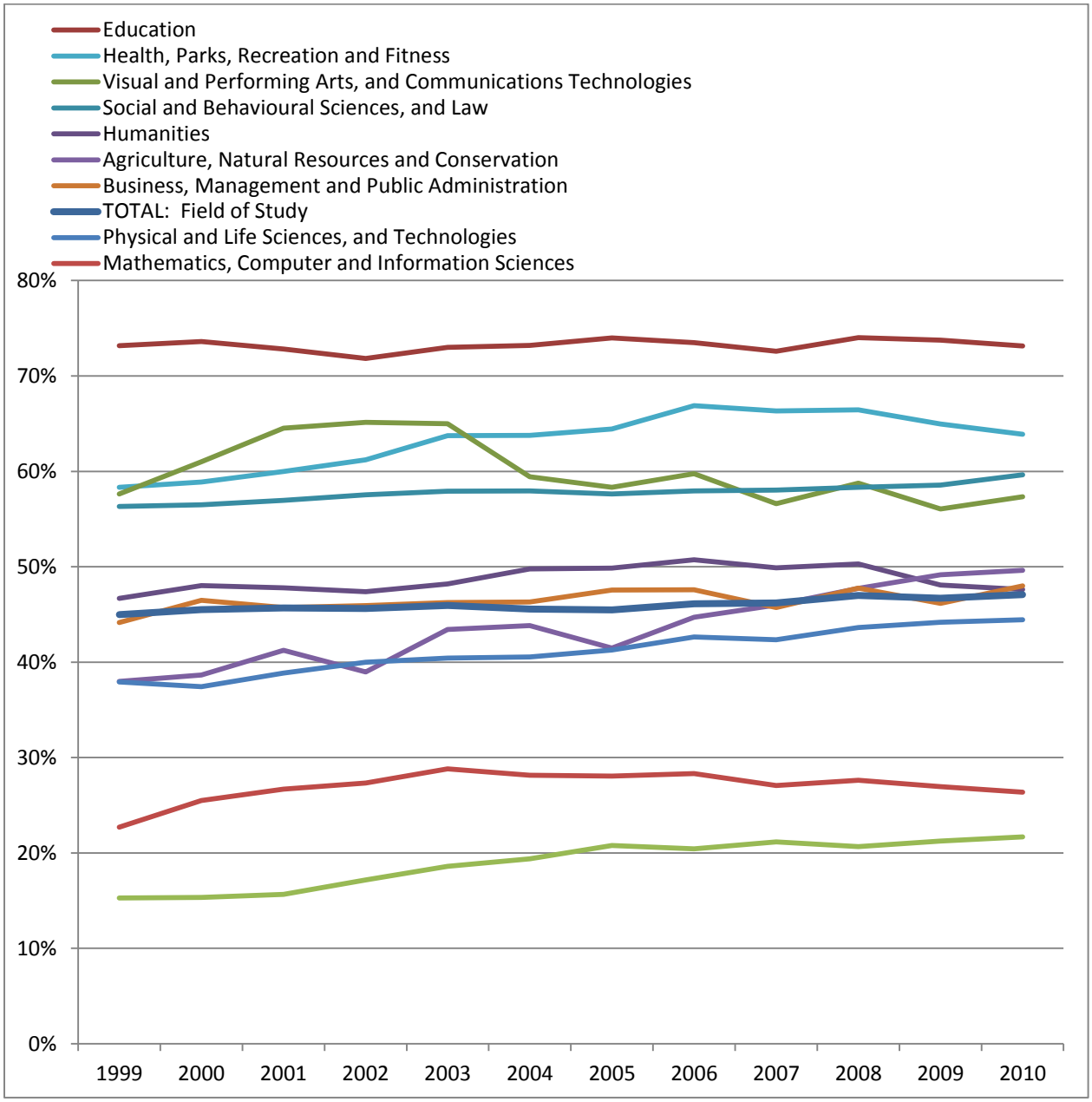
Chart 3: Doctoral Enrolments by Field of Study, Ontario, 1999-2010



Source: Statistics Canada, Postsecondary Student Information System (PSIS)

Chart 4 shows female enrolments in doctoral programs by field of study over the past decade. In 2010, 'Education' (73%) and 'Health, Parks, Recreation and Fitness' (64%) were the fields of study most often chosen by women, with 'Social and Behavioural Sciences, and Law' coming a close third with 60 per cent of enrolments. Other fields that have not traditionally drawn female doctoral candidates, such as Architecture and Engineering, and Mathematics, Computer and Information Sciences, continue to face a challenge in that regard.

Chart 4: Female Enrolments by Doctoral Field of Study[8], Percentage of Total, Ontario, 1999-2010



Source: Statistics Canada, Postsecondary Student Information System (PSIS)

[8] Female enrolments for Personal, Protective and Transportation Services in 2009 and 2010 are not included because they are a count of zero.

Attrition rates and time to completion are also important issues given the financial and personal commitments associated with pursuing a doctorate, and both measures vary widely depending on the program of study and the institution. A national cohort study completed nearly a decade ago estimated that at least 50 per cent of PhD students in the humanities, 40 per cent in the social sciences, and 25 per cent in the physical and life sciences never completed the final requirements of the doctorate, and the average time to completion for those who did earn a doctorate was five to six years (CAGS, 2004). The same CAGS report found that those who abandoned their doctoral program either tended to do so early on or much later, after as many as eight years of completed study (CAGS, 2004). *University Affairs* (Charbonneau, 2013) recently published completion rates and times to completion for PhD students in Canada based on data collected by the U-15, a group of Canada's research-intensive universities. Within nine years of beginning their degree, 78 per cent of students in the health sciences and 56 per cent of students in the humanities had completed their PhDs (Charbonneau, 2013). Mean times to completion were between five years in the STEM fields to just over six years in the humanities (Charbonneau, 2013). A 2006 US study found that seven years was the median time required to complete a doctorate in the US in the life sciences, 12.7 years in education, and 9.7 in the humanities (Jaschik, 2012).

When time to completion is considered alongside the average age at the time of graduation for doctoral graduates in Ontario – 33 years according to the National Graduate Survey (NGS) – this paints a portrait of students studying well into the time they would also be considering engaging in other significant life events such as starting a family, purchasing a home, etc. (Desjardins, 2012; Flaherty, 2013). While dropout and non-completion rates are a concern, lengthy time to completion is also problematic given the limited funding offered to most students and the accompanying loss of potential salary income during this time. For example, some universities offer four years of guaranteed funding through teaching or research assistantships, while others offer five years. Students are also limited by the length of time they are in the program; all institutions have an expiry date for active registration.

Most of what we know about the reasons behind PhD attrition rates comes from the United States. Myers (1999) discusses the most common reasons for not completing the doctorate: location and distance from campus, advice from the faculty supervisory committee, family or personal circumstances, financial reasons, and professional responsibilities that distract from the PhD. Lovitts (2001) argues that "the cause of attrition [is] in the social structure and organizational culture of graduate education" (p. 255). Similarly, Golde (2000) finds that integration into the academic systems of the department plays a critical role in doctoral student experiences.

Finally, there is growing awareness of the mental health pressures experienced by those pursuing a doctorate. Richard Kadison (2004), Chief of Mental Health at Harvard University, describes depression, sleep disorders, substance abuse, anxiety disorders, eating disorders and suicide as some of the issues with which doctoral students are contending. The University of California's student mental health report (2006) notes that: "graduate students as a group have been identified as a population at higher risk for mental health concerns. The level of stress for graduate students is magnified by their relative isolation from the broader components of campus life, the intense academic pressures of their advanced studies, and the increased presence of family and financial obligations" (p. 4). Ontario campuses are now much better informed about these issues, and some have extended student support services that address mental health issues. There is still a long way to go, however; doctoral students are in most cases also university employees who, when confronted with personal difficulty or obstacles, are left to manoeuvre the bureaucracy alone, with no support services in place if they decide to take a leave of absence.

Overall, the process of completing a doctoral program can be lonely, especially in the non-STEM disciplines where more independent research is expected. Combined with financial and family pressures, it is little wonder that many students fail to complete their degrees or take a number of years to do so. The majority of those who begin to pursue a doctorate at an Ontario university do complete their degree requirements,

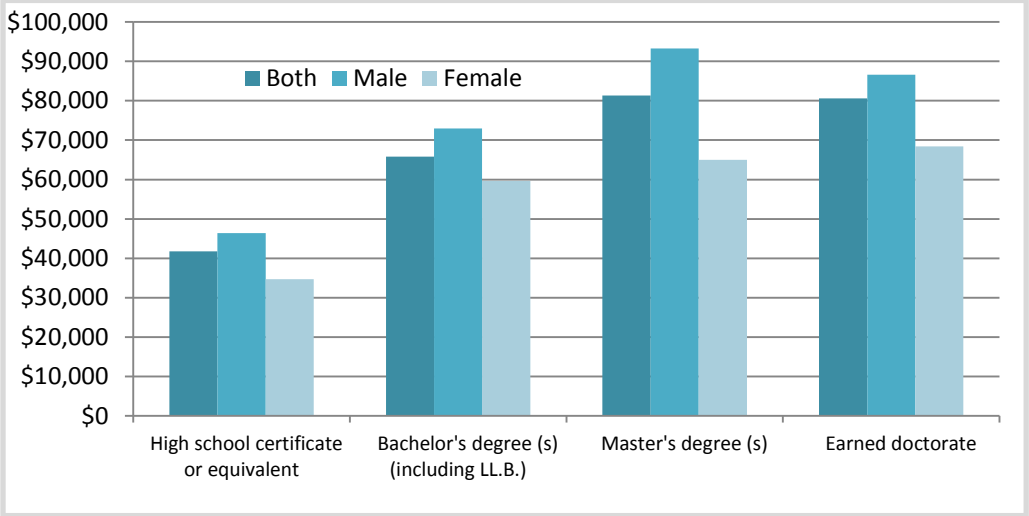
however, and the next portion of the report will focus on the labour market pathways available to those who actually graduate.

Work and Earnings

For many, the perceived earning potential of the PhD may play a significant role in their decision to pursue the credential. Given the years that it can take to complete the degree, years for which most individuals would be largely removed from the labour force and from significant wage earnings, the premium that the doctorate might or might not offer when graduates re-enter the labour force is even more important to take into consideration.

Casey (2009) finds that the earnings premium between a master's and PhD is small in the UK, while the difference between a first degree and a master's is larger. Moreover, the return on a PhD is dependent on the field of study (Casey, 2009). Data from the 2006 Census of Canada paints a similar picture. Chart 5 shows that the PhD premium is less than the premium for a master's degree, and the overall earnings return for a PhD is also less for men than for women.

Chart 5: Average Full-Time Employment Income by Sex, Ontario, 2006 (25-44 years)

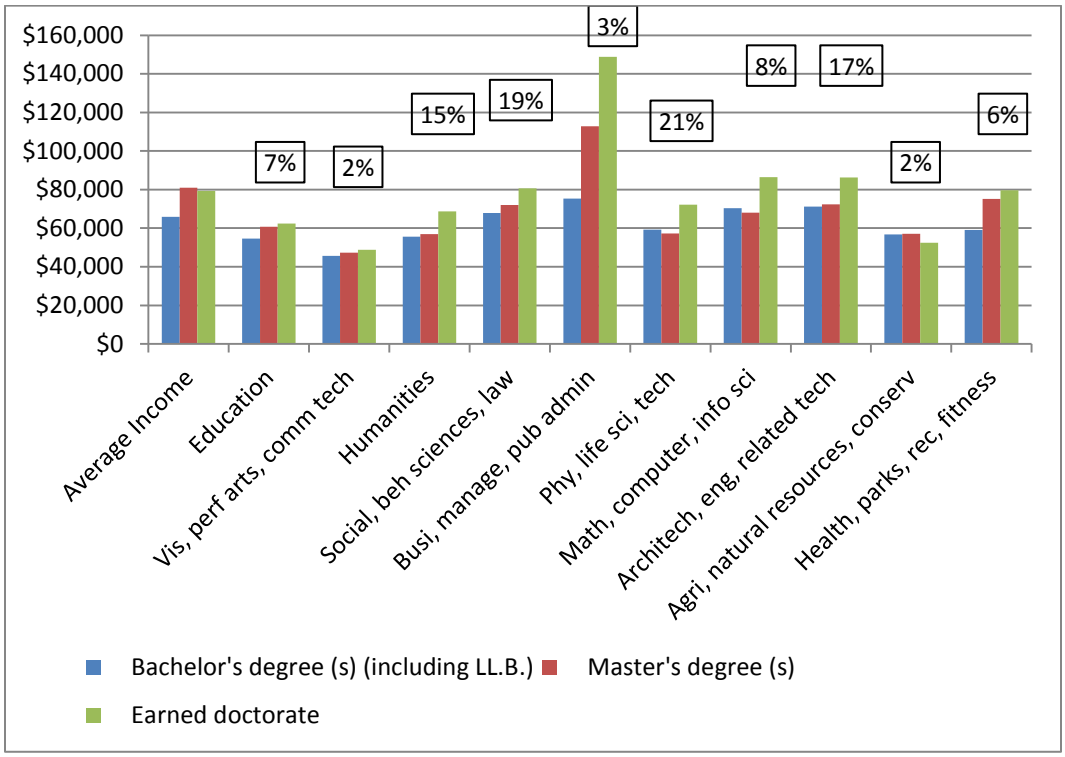


Source: Census 2006

In order to have a more accurate representation of the PhD premium, Chart 6 shows the same analysis by field of study. What can be called the "MBA effect" shows that a large number of master's students (males in particular) graduate from 'Business, management and public administration' and earn more than the average master's graduate in other disciplines. The "MBA effect" thus pushes up the average income for master's graduates. While a few PhD graduates come from this same field of study and also earn significantly more than most, the numbers are not large enough to drive up the overall earnings for PhDs. The predominance of men with MBAs thus likely explains the higher master's premium for men seen in Chart 5. In many other master's fields of study, there are minimal and even negative earnings premiums, and there are positive earnings premiums for nearly all fields of study at the PhD level. The percentage of PhD enrolments for 2006 is shown by the boxed percentages in Chart 6. The professions that were paid the highest for PhDs, such as 'Business, management and public administration,' accounted for less than 5 per cent of enrolment. The field

of study with the highest enrolment ('Physical, Life Science and Technology') at over 20 per cent had an average income of $72,000.

Chart 6: Average Full-Time Employment Income by Field of Study, Ontario, 2006 (25-44 years)



Source: Census 2006

It is also worth noting that census and other data consistently show that doctoral graduates in the Canadian labour force experience among the lowest rates of unemployment. Labour market success is about much more than employment rates and monthly earnings, however. The following section will explore the various options, pathways and challenges that face doctoral candidates and graduates as they begin to contemplate their re-entry into the labour market.

University Tenured Faculty

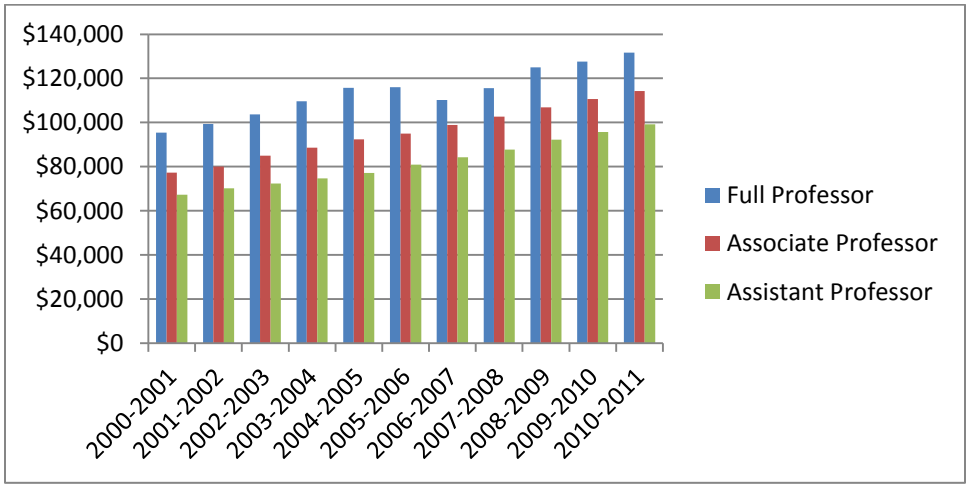
About two-thirds (65 per cent) of Ontario PhDs pursued their degree with the intention of becoming a university professor, and the proportion is even higher in the humanities at 86 per cent (Desjardins, 2012, chapter 3). A completed doctorate is a minimum requirement for most faculty positions at Ontario universities (Statistics Canada, 2011c, p. 6; UCASS, 2012), and there are without a doubt a number of attractive aspects to this career pathway:

- the opportunity to continue to pursue research and teach in an area for which the individual has already developed an obvious passion and expertise;

- the potential of academic tenure (a form of job security);
- salaries which have grown steadily over the past decade, and the accompanying social and economic benefits of pensions, etc.;
- belonging to a profession and holding a job title imbued with social prestige.

For university faculty employed on a permanent (tenured and tenure-stream) basis at Ontario universities, average salaries have increased steadily across all ranks (assistant, associate and full professors) during the past decade (Chart 7). Comparative research of faculty salaries in 28 countries shows that Canadian full-time professors are now the highest paid in the world (Altbach, Reisberg, Yudkevich, Androushchak, & Pacheco, 2012). Earning levels recovered a good part of the ground lost during the last period of financial restraint of the 1990s, when university funding and salary expenditures were reduced both in Ontario and across Canada (Ontario Confederation of University Faculty Associations, 2001).

Chart 7: Average University Faculty Salary (Current $), Tenured & Tenure Stream, Ontario



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

Chart 8 compares the average university faculty salary to other top paid professions in Ontario. While incomes of university professors compare favourably with other professions, it is important to keep in mind that they often enter the labour force years later than their comparably-earning counterparts due to the additional years of schooling and training required of them. As a result, they may also experience delayed participation in other important aspects of life such as marriage, children, purchasing a home, etc.

Chart 8: Average University Faculty Salary Compared to Other Top Paid Professions (Full Time), Ontario

Profession	Rank	Average Salary[9]	Average Qualification[10]
Broadcasting	Manager	$70,700	▪ 4 Years of PSE ▪ Several Years of Experience
Banking	Manager	$72,000	▪ 4 Years of PSE ▪ Extensive Experience and Company Training
Finance	Director	$75,000	▪ 4 Years of PSE (Master's may be required) ▪ Extensive Experience
Construction	Manager	$77,000	▪ Extensive Experience and/or PSE, Master's, Professional Designation
University Professor	Tenure and Tenure Stream	$115,000	▪ 10 + Years of PSE
Engineering	Manager	$92,500	▪ 4 Years of PSE ▪ Extensive Experience ▪ Professional Designation
Lawyers		$111,400	▪ 7 Years of PSE ▪ Articling
Dentists		$127,400	▪ 5-8 Years of PSE
General Practitioners		$146,300	▪ 8-9 Years of PSE ▪ Residency
Judges		$200,000	▪ 7 Years of PSE ▪ Extensive Experience as a Lawyer
Surgeons		$200,000	▪ 8-9 Years of PSE ▪ 5-6 Years of Speciality Residency Training

Sources: Labour Market Information, Human Resources and Skills Development Canada (HRSDC), from *Working in Canada.gc.ca* and Statistics Canada, University and College Academic Staff System (UCASS)

Canadian researchers comparing full-time academic staff around the world found that Canadian faculty work more hours but enjoy better job satisfaction than their counterparts in other countries (Weinrib et al., forthcoming). When Canadian junior and more senior faculty are compared on their levels of satisfaction, there are minimal differences, and they experience generally positive work environments (Jones et al. 2012, p. 189). It is important to keep in mind that these studies involved only full-time faculty; sessional, part-time and contract staff were not included.

[9] Salary information for broadcasting, banking, finance, construction and engineering come from the Labour Force Survey (LFS), Statistics Canada, 2010-2011. Salary information for lawyers, dentists, general practitioners, judges and surgeons come from the 2006 Census, Statistics Canada (LFS data was not available). Salary information for university professors comes from the University and College Academic Staff System (UCASS), 2010-2011 (it is not possible to determine tenure from the LFS).
[10] Average qualification data come from the National Occupation Classification, HRSDC, 2011.

A recent report by HEQCO (2012), based on a pilot study at four Ontario universities, identifies a total average university faculty teaching course load[11] of three and one half courses per year (Chart 9). Faculty who are research active, as identified by the receipt of an external grant or publication output, teach approximately one course less than those who are not research active.[12] It is also important to note that these data do not speak to other teaching activities such as the supervision of graduate students and unassigned time with students or preparing for class, nor do they measure the time faculty spend on the research or service dimensions of their employment responsibilities.

Chart 9: University Full-Time Faculty Workload

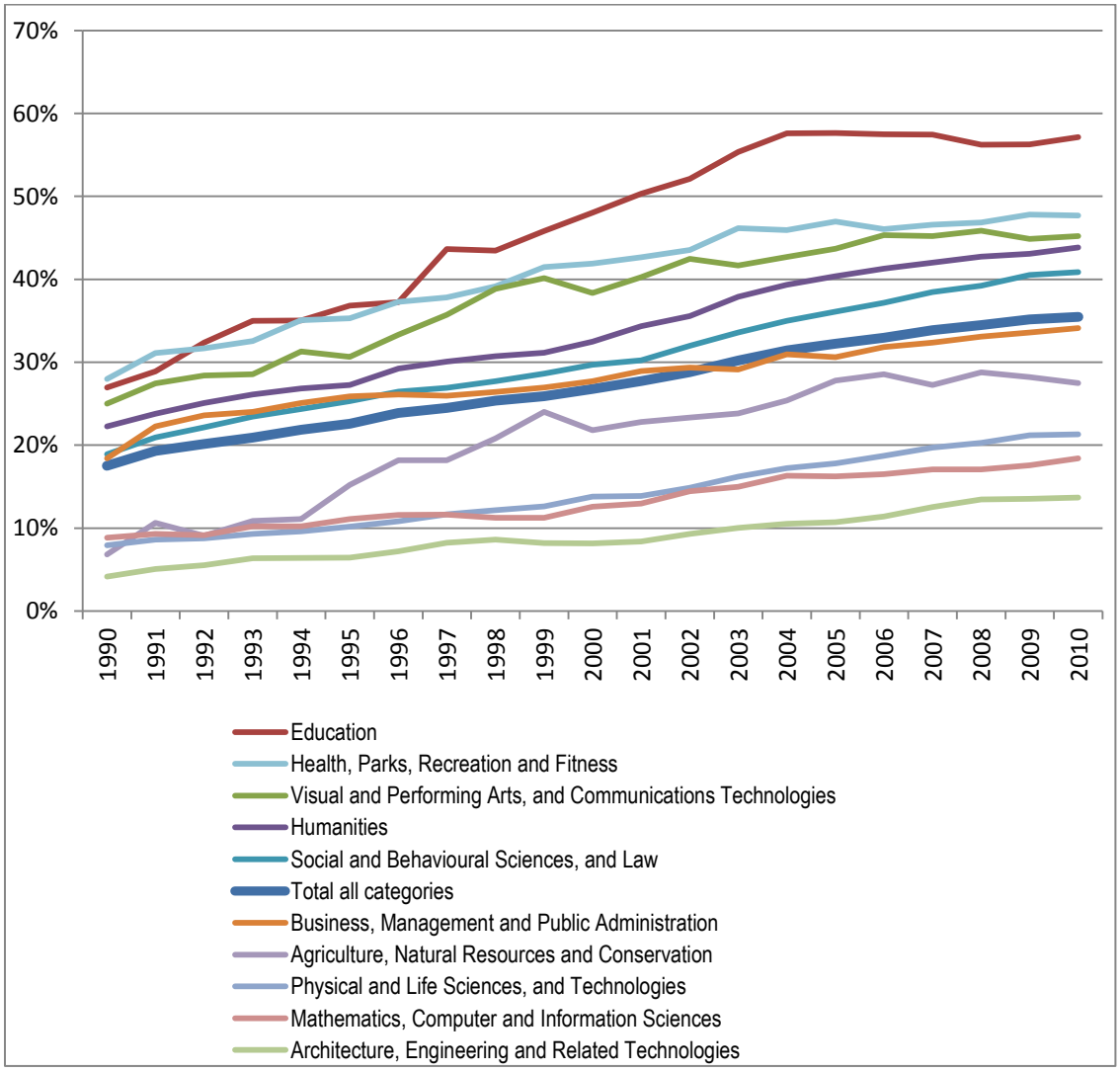
Ontario University Full-Time Faculty Workload – Pilot Study			
	Sciences	Humanities and Social Sciences	Total
Research active faculty average course load per year	2.6	3.4	3.0
Non-active faculty average course load per year	3.4	3.9	3.8
Total average course load per faculty per year	2.7	3.7	3.4

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

There is also encouraging news when it comes to the gender imbalance that previously existed in the ranks of the faculty population (Chart 10). By 2010, the proportion of females in the overall faculty population (in tenured positions or on the tenure track) at Ontario universities had grown steadily from below 20 to 35 per cent. Statistics Canada has attributed this growth to the increasing number of women enrolling in traditionally male-dominated doctoral programs (Sussman & Yssaad, 2005), though substantial growth can be seen in all disciplines, with 'Education' more than doubling the ratio of female faculty from below 30 to close to 60 per cent in 2010, followed by appointments in 'Health, Parks, Recreation and Fitness' at close to 50 per cent and 'Visual and Performing Arts, and Communications Technologies' at 45 per cent (Chart 10).

[11] 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.
[12] University course load data include assigned classes and exclude graduate supervision and unassigned time with students.

Chart 10: Female Faculty, Tenured and Tenure-Stream, by Discipline as Percentage of Total, Ontario, 1990-2010



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

At the same time, it is important to consider the persistent wage gap between women and men in academia, despite the increasing pool of qualified women (Monroe & Chiu, 2010). The *Report of the Pay Equity Data Working Group* (2010) at the University of British Columbia (UBC) found that about 50 per cent of the income differential is accounted for by the underrepresentation of women at the most senior full professor level, and another quarter of the pay difference can be explained by the fact that female faculty are overly represented in lower paying departments. The UBC working group (2010) found that a $3,000 pay disadvantage remains after accounting for experience, a gap which they consider to be discriminatory.

Gender differences in job satisfaction must also be taken into account. The National Science Foundation (2004) found that women are leaving academia (specifically science and engineering fields) at higher rates

than men. Callister's (2006) research shows that the main issue leading to work dissatisfaction among science and engineering faculty is department climate, which was found to have a disproportionate impact on intentions to quit for female faculty.

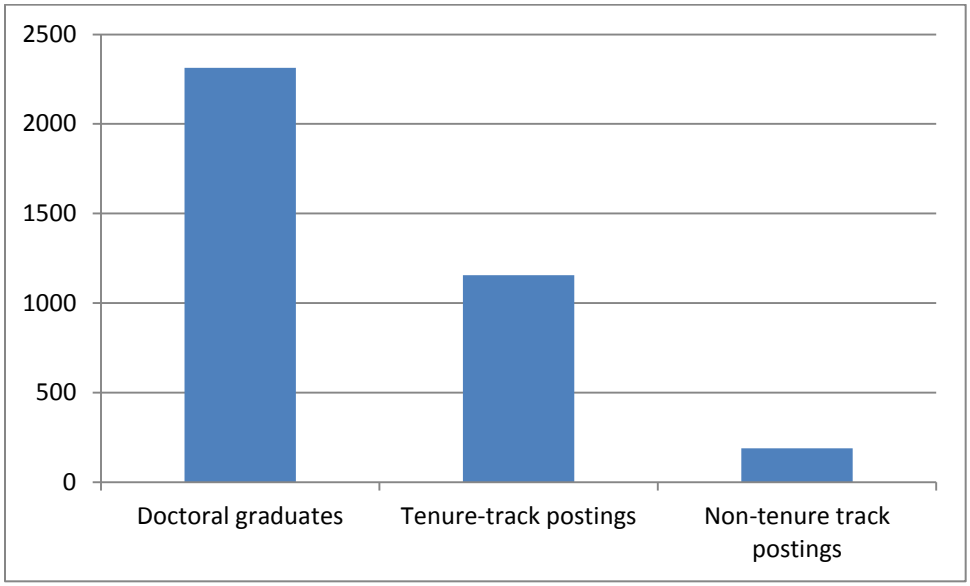
The Council of Canadian Academies was recently asked by the federal Minister of Industry to investigate the career pathways of women researchers in Canadian universities. The report (2012) addresses gender disparities among Canadian researchers with respect to discipline, rank, tenure, salary, research funding, etc. and compares them to the experiences of women in the United States, United Kingdom, Germany, Australia, France and Sweden. Highlights from the report include the following:

- The representation of women in faculty ranks varies by discipline and rank in Canadian universities, with women overrepresented in humanities, social sciences, education and life sciences and underrepresented in the STEM fields;
- The higher the faculty rank, the lower the percentage of women in comparison to men;
- Findings were similar in other economically advanced nations.

The report found that the faculty career trajectories of women are influenced years earlier through socialization and stereotypes. Because there are few women in senior faculty leadership roles, especially in STEM disciplines, it is difficult for younger women to envision themselves as leaders. Persistent salary differentials and challenges related to work-life balance also continue to confront female academics and researchers with families.

While the potential economic payoff of having an earned doctorate is the good news, there are other, more sobering realities to consider. While available assistant professorships have increased in Ontario since 2005, so too has the supply of PhDs, which vastly outnumbers the increase in demand for new full-time faculty (Clark, Trick, & Van Loon, 2011). Chart 11 compares the number of tenure-track positions advertised (though not necessarily filled) by Ontario universities in 2009 to the number of doctoral graduates emerging from Ontario universities that same year. For the number of newly-minted PhDs emerging onto the job market every year, the demand does not even come close to meeting the supply. It is also worth keeping in mind that while some individuals earning PhDs at Ontario universities are out-of-province and international students seeking employment elsewhere upon graduation, there are also numerous individuals earning PhDs outside of the province competing for those same faculty positions. Also, those who do not find a job one year will often end up back on the academic market the next year, resulting in several graduating cohorts hunting for academic employment in any given year. We should also remember that many PhDs, especially those in STEM fields, are not looking for academic positions. However, given that many humanities and social science PhD graduates are seeking academic positions and being mentored to become professors, the discrepancy between the graduation rate and faculty postings is not reassuring.

Chart 11: Ontario Doctoral Graduations Compared against Ontario *University Affairs* Job Postings, 2009-2010[13]



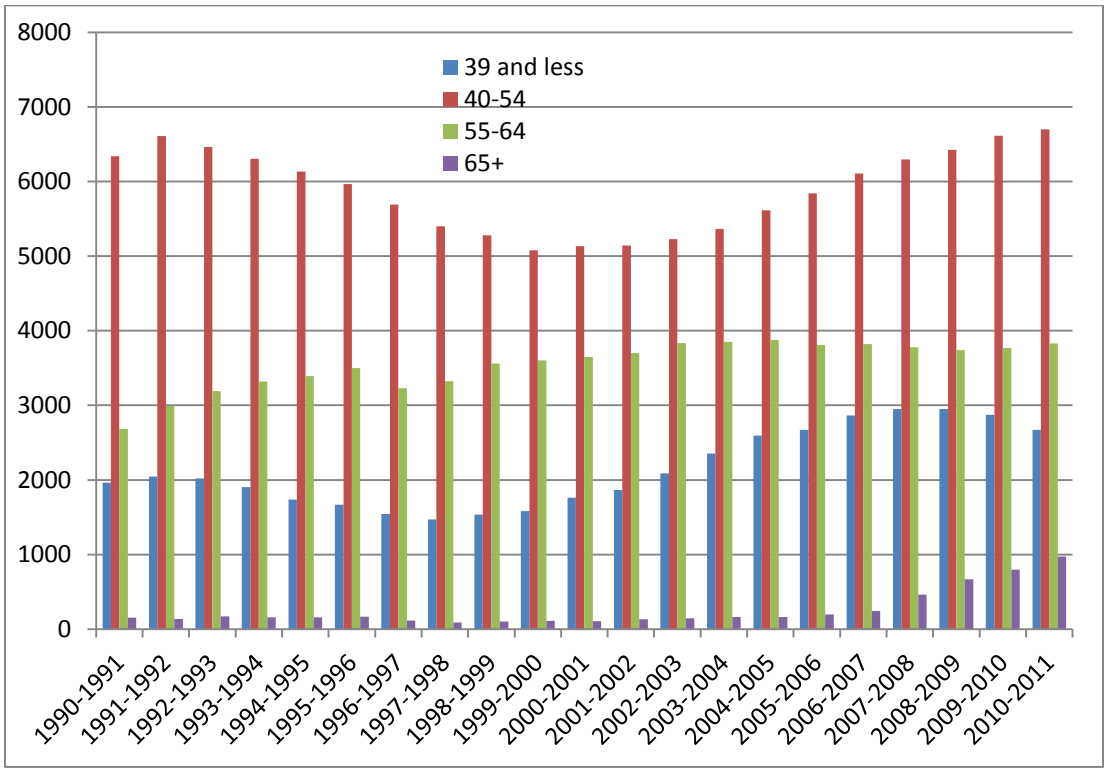
According to Statistics Canada research (Desjardins, 2012), the decline in the availability of tenured or tenure-stream positions across Canada was even more pronounced for professors under the age of 35. In 1980-1981, one-third of professors under age 35 (35 per cent) held a full-time tenured or tenure-track position; 25 years later, this was true for only 12 per cent of professors in that age category. The predicted career opportunities – especially for those aspiring to be hired as university professors – have clearly not transpired in reality. As one current doctoral student puts it, "You come in here with the dreams of doing something but you have to face the reality of the job market outside" (Sekuler, Crow, Annan, Mitacs Inc., & Academica Research Group Inc., 2013, p. 13).

Both the number and the ratio of younger faculty (those aged 39 and less) did in fact rise steadily as universities began to replace the faculty who retired in the earlier lean years (Chart 12). But after peaking between 2007 and 2009, the ratio of younger to older faculty (aged 39 or less) has started to decline again:

- the introduction of the 2006 Ontario Human Rights Code, which prohibited the imposition of mandatory retirement for employees aged 65 or more, has allowed those ranks to grow in recent years (Chart 9; see also Gewin, 2012);
- throughout the fiscal restraint of the 1990s, universities offered generous buyout packages to encourage early faculty retirements but replaced less than 50 per cent of those who left (Beach, Broadway, & McInnis, 2005);
- universities are part of a very global market, and the AUCC (2007, p. 17) estimated that more than one-third of newly-appointed faculty between 1999 and 2004 had earned their doctorate outside Canada;
- there has been an additional decline in new hires by universities since the financial crisis of 2008-2009 (AUCC, 2007, p. 4).

[13] Tenure-track postings include assistant professorships; non tenure-track postings include part-time, sessional, limited term appointments, contractual and management positions.

Chart 12: Number of Tenured and Tenure-Stream University Faculty, All Ranks, by Age Group, Ontario, 1990-2011



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

Alternative Academic Pathways

As more individuals emerge from doctoral programs with completed PhDs and the long-anticipated demand for university faculty hiring fails to transpire (see Mason, 2012), those seeking to pursue an academic career must consider several alternative pathways if they are unable to find a permanent faculty appointment at a university upon graduation. While an increasing number of students enter the PhD for reasons other than to become a professor, the fact remains that, in the social sciences and humanities in particular, many programs continue to train and mentor students for careers in academia that are harder and harder to come by. Among the most common options described in the sections below are the following types of appointments: 1) postdoctoral positions; 2) part-time/contract university teaching, 3) university teaching-stream positions; 4) college instructor positions.

Postdoctoral Work

The decision about what path to take after completing the PhD varies from person to person, as well as by discipline. Individuals decide upon one path over another based on their personal aspirations, perceptions of the job market, and their original reason for pursuing the PhD, among other things. Many doctoral graduates believe or are told that they would benefit from a postdoctoral appointment to be considered seriously for a university faculty appointment, particularly at research-intensive universities. Plans to take a postdoctoral appointment differ by fields of study. Data from the NGS show that only 7 per cent of graduates from education and other fields of study planned on working in a postdoctoral position after graduation (Desjardins, 2012). By comparison, close to 70 per cent of life sciences graduates planned to take a postdoctoral position upon graduation (Desjardins, 2012).

Postdoctoral appointments also vary widely in terms of pay and working conditions. Some are formal awards for which doctoral candidates must apply and compete, such as the much sought-after SSHRC Postdoctoral Fellowship, which is valued at $38,000 per year; the Natural Sciences and Engineering Research Council of Canada (NSERC) Postdoctoral Fellowship, valued at $40,000 per year; and the Canadian Institutes of Health Research (CIHR) Fellowship, with a maximum value of $60,000 per year for five years, with an additional research allowance of $5000 per year. The Banting Postdoctoral Fellowship recruits top-tier Canadian and international postdoctoral researchers at an internationally competitive level of funding of $70,000 for two years.

Other postdoctoral fellowships are much more informal arrangements with individual research faculty. Carleton University recently devoted considerable thought and resources to developing guidelines for postdoctoral appointments (Carleton University, 2011):

- appointments generally take place within five years of the completion of the doctorate, though the Tri-Council specifies that it should occur within two years and that the appointment should last for a maximum of two years;
- as a rule, postdoctoral appointees are not considered to be employees of the university, though at some institutions they might be;
- they may also undertake a minimal number of teaching responsibilities;
- the appointee has the freedom to publish his/her research during the period of appointment.

In a national survey recently completed by the Canadian Association of Postdoctoral Scholars (CAPS), more than 75 per cent of postdoctoral respondents were aged 30 or older and earned less than $45,000 per year (2009). The majority relied on funding not from direct grants but from the research grants of their faculty supervisors, and in most cases their income has been considered taxable as result of 2006 changes to federal tax laws. Fewer than 5 per cent of postdoctoral fellows reported having Canada Pension Plan contributions or child care subsidies, though many postdoctoral fellows at Ontario universities belong to the Canadian Union of Public Employees (CUPE). Even at universities where postdoctoral fellows are not unionized, health and dental benefits are typically provided. The ambivalence that many postdoctoral fellows feel about their appointment was apparent in the responses to the CAPS survey; even though they now had an earned doctorate, more than one-third of respondents would still rather be considered a student/trainee (CAPS, 2009).

The Survey of Earned Doctorates (Class of 2005) noted that the majority of Ontario doctoral graduates (67%) who were planning to move to the United States were doing so in order to begin a postdoctoral position (Desjardins, 2012). Many students are encouraged by their institutions to pursue postdoctoral fellowships outside of Canada to gain experience with leading researchers in their field. Forty-seven per cent

of Ontario doctoral graduates who were planning to remain in Canada also had plans to take a postdoctoral position upon completion of their program (Desjardins, 2012), far more than the number of available positions. The sense of increased competiveness was echoed in recent focus groups with doctoral students. While participants valued postdoctoral fellowships, they commented that the expectation is to complete at least one postdoc before applying for a tenure-track position (Sekuler et al., 2013, p. 13).

Part-Time/Contract University Teaching

For retired faculty who want to remain active teachers, or for individuals who have other full-time careers and are only interested in teaching the occasional course in their professional field, part-time teaching contracts are worthwhile opportunities.

For doctoral candidates in the later years of their program, part-time (or sessional) teaching may become an additional source of income, as scholarships, assistantships and research positions are often no longer offered or guaranteed. For those who are still working on their dissertations, however, the additional teaching responsibilities often make it difficult to find the time or focus to complete the degree. At some institutions, union rules, sessional contracts and university restrictions on hours of work limit the opportunities for doctoral students to teach courses. While students know that sessional teaching experience might increase their viability for a future tenured faculty position, the lack of teaching opportunities at their home institution may lead them to find sessional work at other universities, increasing the challenges.

For recent doctoral graduates, these appointments are an opportunity to gain valuable teaching experience and to some extent can provide a source of income as well. But for many in recent years, these temporary teaching opportunities have become a way of life, as sessional faculty juggle multiple courses, often at multiple institutions and for consecutive years. The sessional world is filled with inequalities: since they tend to be hired to teach the larger first- and second-year courses, contract faculty workloads can be overwhelming in exchange for minimal pay of as little as $5000 to $6000 per course, shared office space not conducive to private conversations with students, little or no choice of courses, and no time or additional resources set aside for research, conferences, etc. (Maclean's, 2007).

In Ontario universities, it is likely that more than 50 per cent of undergraduate students and/or courses are taught by non-permanent faculty, also known as "sessional," "contract" and "limited-term" appointments.[14] Early results from the 1997 survey of 1995 doctoral graduates showed that "of the 80 per cent working full-time, more than one in three [were] in temporary positions" (AUCC, 1999, p. 48), presumably including many non-tenured teaching positions. Unfortunately, solid numbers simply do not exist because each institution measures what constitutes part-time teaching differently and most do not share their data publicly (Maclean's, 2007). The issue here is that while undergraduates and their parents are paying tuition with the expectation that they will be taught by tenured faculty, many are actually being taught by graduate students or recent doctoral graduates with limited experience and who are earning a fraction of full-time faculty salaries. While sessional instructors may well be gaining valuable work experience for themselves, the fact remains that universities are increasingly relying on this form of labour to teach their core classes, and these sessionals have no job security and are paid very little.

[14] One Ontario university estimates that 1,000 sessional union members currently do about 54 per cent of the teaching across the disciplines.

University Teaching-Stream Faculty

Another teaching alternative increasingly available at some Ontario universities are teaching-stream faculty appointments or permanent lecturer positions. A recent HEQCO report on the topic (Vajoczki, Fenton, Menard, & Pollon, 2011) found that approximately half of Ontario universities offer at least some of these appointments, which are also tenure-stream and come with an increased teaching load and a reduced requirement to undertake academic research. Some institutions require teaching faculty to undertake pedagogical research. According to the report, those holding these positions are generally satisfied and 75 per cent would choose to remain in their position if given the option to transfer to a more traditional faculty appointment.

While employment in this category is more secure than the part-time/sessional option described earlier, disadvantages include less time and priority for research and a sense of second-class or "underclass" status, especially at universities where research continues to be a priority (University Affairs, 2012). Given that many if not most teaching-stream faculty are not required to produce publications, the very nature of the expectations made of them may in turn put them in a space where they may not feel as valued as their research faculty counterparts.

College Instructors

Another pathway has emerged in recent years for the growing numbers of PhD graduates seeking employment and still committed to postsecondary teaching. Ontario's 24 publicly-funded colleges employ 7,000 full-time instructors and are offering an increased number of university and university-articulated programs for which they require faculty with earned doctorates. A quick glance at job postings for Ontario colleges reveals that they are increasingly requiring applicants to have a completed doctorate, in combination with a number of years of teaching experience. Unfortunately, information about college faculty's highest earned credentials is not collected or publicly available system-wide, even though each college likely collects this information individually.

Non-Academic Career Options

In some cases, the doctorate may have been initiated and completed while the individual remained employed. The PhD itself might have been pursued for reasons related to personal satisfaction or interest, or may have been required if the individual hoped to advance in his/her professional career outside of the university. The National Graduate Survey (Class of 2005) asked respondents to explain why they did not consider becoming a university professor as a career choice (Desjardins, 2012). Of those Ontario doctoral graduates interested in pursuing non-faculty careers, 29 per cent believed they could make more money or that they would have better job opportunities outside academia (Desjardins, 2012), 44 per cent preferred clinical or practical work, and 43 per cent wanted to do research but were not interested in teaching (Desjardins, 2012).

Many other PhDs feel that they have no other option but to pursue the academic track. This may stem from the fact that academia is all they are familiar with or from the belief that they may not possess the skills to do much else. Therefore, many get stuck on the elusive tenure-track search indefinitely. Yet every year out of the doctorate, job seekers are up against more and more recent graduates from Canadian and foreign universities, and even some individuals who have already secured a tenure-track position and decide to re-apply in search of a position that is closer to home or at a more prestigious institution. The sentiment that becoming a university professor is the only path after graduation is perhaps a symptom of the very academic

nature of the time spent in graduate school for many students, especially those in the social sciences and humanities – writing and trying to publish academic papers, presenting at academic conferences, much of it theoretical work with limited or indirect practical application. While many students are taking part in engaged research and interacting with individuals outside the university as part of their studies (conducting interviews, for instance), they are not familiar with how to communicate the skills that they have acquired through these activities to employers outside of the academic realm.

The narrow focus of a literal "apprenticeship" to become a professor, combined with little contact with the world outside of academia, leaves little question why many PhD graduates feel at a loss after graduation, especially once they decide to pursue a non-academic path. The *Chronicle of Higher Education* (Cassuto, 2012) published a report highlighting Stanford University's plan to "reimagine the whole graduate curriculum" (p. 1) in order to address the out-datedness of the apprenticeship model. Specifically, the Stanford University plan proposes a "multi-track" PhD, where students would decide in their second year whether to pursue an academic or professional path after graduation and adjust their remaining course requirements accordingly. Even their dissertation would reflect their post-graduation career plans – "dividing scholars from teachers" (p. 2). Similarly, the City University of New York (CUNY) Graduate Center will use funding from the state legislature to overhaul the university's doctoral programs over the next five years, focusing the changes on helping students graduate within a shorter timeframe and better prepared for the non-academic job market (Flaherty, 2013).

An issue that is rarely explicit but certainly makes its way into private conversations is the taboo of going into the "public" sphere after graduation; some even relate it to selling out academia. While this attitude varies from discipline to discipline, some PhD students feel unable to talk openly with their supervisors about their thoughts or plans to pursue a more applied form of employment after graduation, and the lack of support from many faculty to pursue this path is an issue that requires more attention. This is an especially poignant concern given the current labour market situation. One PhD candidate stated in a recent focus group: "I feel like there's a sense of resistance to promote [public sphere work opportunities] to PhD students. Even just having a conversation about working outside academia is a hard conversation to have. It's something you just don't talk about and I think it's on the part of both students and professors who are in the department…" (Sekuler et al., 2013, p. 17).

Furthermore, some students feel that they were not advised to make connections and networks in graduate school through external research assistantships or simply by branching out and forging relationships with other faculty. Others may choose to change pathways as their ambitions to become a professor are met with the harsh reality that there simply are not enough tenure-track positions available. Not wanting to remain on the postdoctoral or part-time teaching treadmill indefinitely, many doctoral graduates are turning to government employment, think tanks or the private sector. According to Statistics Canada's 2006 Census, 33 per cent of Canadian-born Ontario residents with an earned doctorate worked as university professors. Others were employed in a variety of occupations ranging from management (12 per cent), business, finance and administration (4 per cent), and in sales and service occupations (2 per cent). Data from the National Graduates Survey, class of 2005, reports that "more than half were employed in educational services [58 per cent for Ontario] with the vast majority of those working in a university [88 per cent]" (Desjardins, 2012, p. 33), though likely often in non-tenure stream or administrative positions.

In light of the fact that many PhDs opt for non-academic careers, websites like The Versatile PhD have emerged and are catering to humanities and social science graduate students, ABD candidates and PhDs. The Versatile PhD connects like-minded PhD students and graduates by offering a support system through the process of transitioning from academia to other areas of work and has recently added STEM content in response to high demand. This free service contains a listserv that anyone can join and contains resources anyone can access. The additional premium content includes access to real resumes and cover letters used by successful job applicants, as well as narratives of their job-hunting experiences. Given that 43 universities

are subscribed to the institutional version of the service (including two Canadian universities – McGill and Western), it is clear that some universities are indeed taking notice of the need to support students in their non-academic endeavours.

With the move of many PhDs to non-academic fields, the Organisation for Economic Co-operation and Development (OECD) has committed to mapping PhD transferable skills around the world, recognizing the importance that "soft skills" have in the work environment (Myklebust, 2011; Bridgstock, 2009). As a result of this increased flow of doctorates to non-academic pathways, many institutions are also recognizing the importance of professional training and certificates for their students (The Economist, 2010, p. 7).

Programs like Mitacs – originally known as the Mathematics of Information Technology and Complex Systems internship and involving partnerships between federal and provincial governments, universities and private sector employers – are designed to help graduate students apply skills learned in the classroom to workplace opportunities. For some disciplines like engineering, which make up the majority of Mitacs appointments, students learn how to communicate their research more effectively. Participants in a recent focus group supported by Mitacs suggested that the organization broaden its scope through targeted recruitment of social science and humanities students (Sekuler et al., 2013, p. 18).

Many universities have introduced professional development programs designed to better prepare graduate students for life after graduation. Doctoral candidates may be offered some combination of opportunities to teach their own courses, training and support in pedagogy, course design including certificate programs in some cases, and assembling teaching dossiers (Steele, 2009). Other efforts are being made to provide doctoral candidates with internships and other exposure to non-academic career paths. Most are voluntary initiatives, however, available to interested doctoral candidates and not part of the requirements of most doctoral programs.

Marilyn Rose (2012), past Dean of Graduate Studies at Brock University, recently prepared a report entitled "Graduate Student Professional Development: A Survey with Recommendations" that was commissioned by CAGS and SSHRC. The report is a comprehensive document that stresses "the important topic of professional skills development for graduate students as an essential component of their graduate training" (Rose, 2012, p. 2). Rose (2012, pp. 30-34) recommends the following to universities:

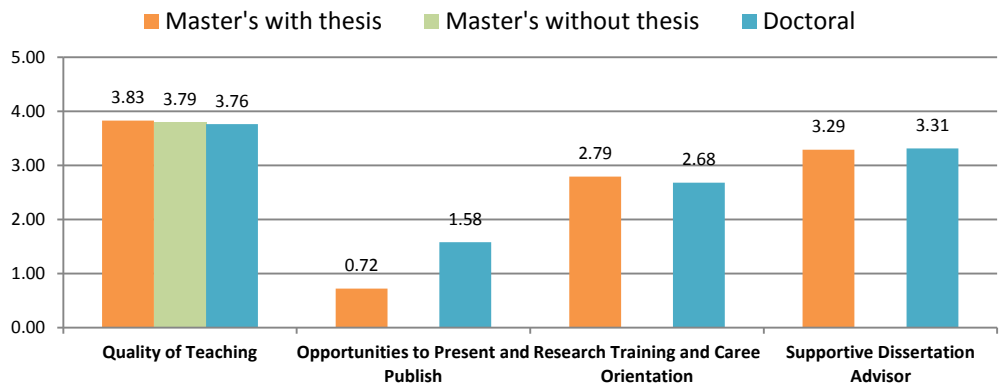
- prioritize professional skills training for graduate students, including both "academic" and "soft" skills, and dedicate funds to this endeavour;
- have graduate studies faculties lead and engage in ongoing assessment of professional development opportunities;
- involve international graduate students and postdoctoral fellows, and employ graduate students in professional development design and administration;
- ensure faculty engagement and buy-in, and encourage external and internal partnerships and granting council support.

What PhDs are Saying

The best available measure of student satisfaction with their experience in Ontario doctoral programs is the Canadian Graduate and Professional Student Survey (CGPSS), which was administered in 2007 and 2010 (and will be administered again in 2013). On both occasions, approximately 70 per cent of doctoral candidates reported that they would select the same institution if they were to commence their program of study again. Compared to master's students, doctoral candidates were more likely to report that they would select the same field of study if they were to start their graduate/professional career again. The 2007 and

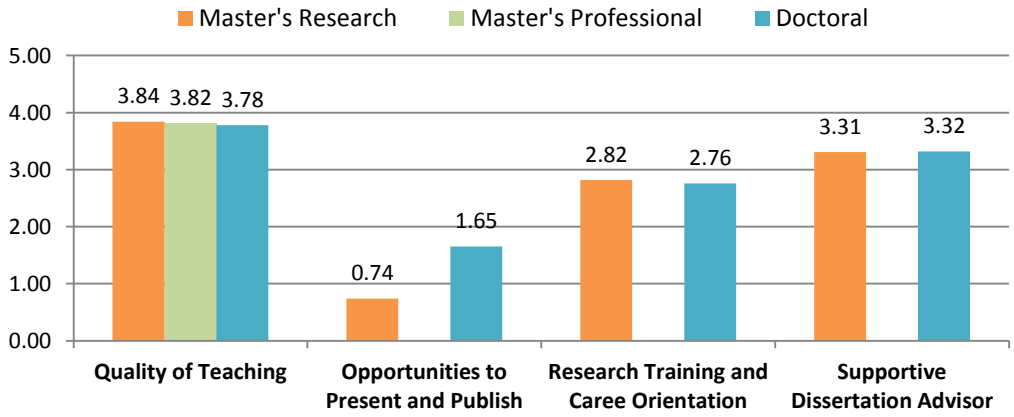
2010 CGPSS asked Ontario students about their satisfaction with their program and quality of interactions. Charts 12 and 13 (Zhao, 2012, p. 42) present Canadian doctoral students' mean scores for quality of teaching, opportunities to present and publish, research training and career orientation, and having a supportive dissertation advisor. In both surveys, doctoral students reported that they had experienced a "good" quality of teaching and had a supportive advisor, while opportunities to publish were scored as "poor to fair" and research training and career orientation as "fair."

Chart 13: Benchmarks by Degree Type, Mean Scores, Ontario Universities, 2007



Source: CGPSS

Chart 14: Benchmarks by Degree Type, Mean Score, Ontario Universities, 2010



Source: CGPSS

A recent qualitative study co-funded by HEQCO focused on PhD candidates and recent graduates (including postdoctoral fellows and sessional instructors) and their plans and intentions for their careers. The focus groups discussed the extent to which these individuals felt that their institution supported and prepared them for life after graduation, their knowledge of the labour market and their needs moving forward (Sekuler et al., 2013). Focus group participants reported that they would like more opportunities to network with graduated

PhDs who are already out in the workforce (p. 20). They also would like more contact with "[individuals] not related to your supervisor that you can talk to about the job market" and they believe "creating a database of what alumni are doing after they leave grad school" would be beneficial for students to see what career options are available (pp. 16-17).

Recommendations

- **Government** – It is important for governments to consider their objectives in promoting increased PhD enrolments. Simply elevating the population-adjusted PhD enrolment in Ontario to that of other jurisdictions appears to be an insufficient rationale for the considerable investment governments have made, and continue to make, in doctoral programs. Once the objectives have been identified, governments should monitor carefully whether the investments are leading to those desired outcomes. These objectives should also take into account the actual demand for PhD graduates in the labour market.

- **Graduate Programs** – The majority of PhD graduates will not secure full-time academic positions, even if this is the dominant aspiration motivating students to seek these degrees. The education offered to students in PhD programs should accommodate this reality. Institutions should be more open with students about attrition rates and the labour outcomes of doctoral graduates, especially for those who end up in positions other than the traditional academic ones.

- **Students** – Pursuing a PhD is a serious commitment of time and effort, with no guarantee of a significant career or earnings return on that investment. Students should consider whether a doctoral program is really suited to their personal goals, interests and labour market aspirations. As part of these considerations, students might seek out current students and recent graduates for information on their experiences; insist that their program of interest make available statistics on labour market outcomes and career pathways of recently graduated students; and ask about professional development opportunities available to doctoral candidates, especially those designed to help students learn how to market themselves and their skills for non-academic careers.

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